RELATIONSHIP BETWEEN TAX REVENUE AND ECONOMIC GROWTH IN NEPAL

A Thesis

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By

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RECOMMENDATION LETTER

This thesis entitled "**Relationship between Tax Revenue and Economic Growth**" submitted by **Namrata Gautam** under my supervision for partial fulfillment of the requirements for the degree of Masters of Arts in Economics. I forward it with recommendation for approval.

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DECLARATION

I hereby declare that this M.A. Thesis entitled **Relationship between Tax Revenue and Economic Growth**, submitted to the Central Department of Economics, Tribhuvan University, is entirely my independent work prepared under the supervision of Dr. Rashmee Rajkarnikar. I have made due acknowledgements to all the ideas and information borrowed from different sources in the course of writing this thesis. I shall be solely responsible for any evidence found against my declaration.

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ABSTRACT

The study seeks to find out the trend of tax revenue in Nepal. The relationship of economic growth rate and tax revenue is debatable and have mixed results among the researchers. This study thus explores the relationship between tax revenue and economic growth which is measured in Real Domestic Gross Product. For the study, 34 years data from 1985/86 to 2018/19 have been used.

ARDL techniques of cointegration and ECM transfomation of the ARDL have been used for the long run and short run analysis of the relationship between the variables, that are economic growth and tax revenue. To check the stability of the coefficient, CUSUM and CUSUMQ square have been used and the datas have been analysed through the descriptive analysis. Also, the relationship of economic growth and tax revenue implies that a 1 percent increase in tax revenue causes a 0.192032 percent increase in economic growth. This has rationality because increase in revenue contributes in economic activities which further increases the income of the public. The R-squared and adjusted R-squared shows that there is overall significance of the model. This implies that 61.67 percent of the variation in economic growth (measured by Real Gross Domestic Product) can be explained by tax revenue.

The residual and stability diagnostic show that the data is free of Heteroskedasticity and Serial Correlation and also concludes that the model used in the research is stable. The coefficient of error correction term, on the other hand implies that about 41.55 % of total adjustment takes place annually when shock arises.

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LIST OF ABBREVIATIONS/ACRONYMS

ARDL	Auto Regressive Distributed Lag model
CBS	Central Bureau of Statistics
CUSUM	Cumulative Sum of Recursive Residuals
CUSUMSQ	Cumulative Sum of Squares of Recursive Residuals
GDP	Gross Domestic Product
GON	Government of Nepal
LOGRGDP	Log of Real Gross Domestic Product
LOGTR	Log of Tax Revenue
NRB	Nepal Rastra Bank
NRS	Nepali Currency.
OLS	Ordinary Least Squares.

CHAPTER I

INTRODUCTION

1.1 Background of the Study

It has been the concern of policymakers to determine the relationship between economic growth with various macroeconomic factors. So, is the attention of researchers to determine the relationship of tax revenue on economic growth. Taxation is a vital fiscal policy for any country and its economy. It is a compulsory payment made by the individuals or institutions and it is also defined as a levy or other type of financial charge or fee imposed by the government on legal entities or individuals. It is a kind of money of which it is the legal duty of every citizen of the country to pay honestly. Tax is computed and paid as prescribed in the law. A taxpayer is not entitled to compel the government while paying taxes, to give something to him in return for the amount he has paid. Taxation plays a vital role in sustainable growth as well as poverty reduction in developing countries. It also provides a stable fiscal environment which contributes to economic growth as well promotes social and physical infrastructure required for sustainable development.

Based on impact and incidence, the tax is categorized into two types i.e. Direct tax and Indirect tax. Direct tax is a tax that is paid by a person on whom it is legally imposed. Income tax, vehicle tax, gift tax, interest tax, etc. are few categories that fall under direct tax. Those taxes which are levied on the receipt of income are called a direct tax. In the case of direct tax, the tax is collected at the source directly by the government. And the time, procedure, and amount of tax to be paid is certain. In case of emergency, the government can increase the tax rate to raise tax revenue.

On the other hand, indirect tax is a tax that is imposed on one person but partly or wholly paid by another person. Indirect tax is levied on the computation of goods and services. Entertainment tax, sales tax, customs duty, hotel tax, passenger tax, excise duty, value-added tax (VAT), etc. are some indirect taxes. In the case of indirect tax, the tax is collected in small amounts while making consumption or purchases.

The origin of taxation can be traced to primitive civilizations. In Yemen, some tax types were imposed upon people during Fifth Century B.C. in the Qataban Kingdom.

Those taxes were called Commodity tax, sales tax, property tax, etc,and those taxes were collected by official appointment by the King. Great Britain is the first country in the world to introduce the modern income tax in 1799 to finance the war fought with France. The USA introduced income tax in 1862 to generate revenue to finance civil war.

"In India, land value revenue or land products have a very long and multifaceted history". In the Vedic period, there was individual ownership of land and a compulsory levy called (Bali) was realized by the King or Chieftain from individual peasant proprietors. (Bali) was payable in kind as a part of gross agricultural product.

In Greece, in times of war, the Athenians imposed a tax referred to as "eisphora". No one was exempt from the tax, which was used to pay for special wartime expenditures. The principle of taxation carries a long history, where several ancient civilizations, including Greeks and Romans, levied taxes on their citizens to pay for military expenses and other public services. The basic concept of taxation evolved significantly as empires expanded and civilizations became more structured. The first, known written record of taxes dates back to ancient Egypt around 3000-2800 BC.

The history of taxation in Nepal dates back to antiquity. Nevertheless, the modern tax system gained its momentum with the establishment of democracy, and the implementation of the first consolidated budget took place in 1951 (Dahal, 2013). Until the late 1950's the two major sources of revenue were land tax and a tariff on foreign trade. After 1959, however, sales, and property taxes, as well as several other minor taxes, were introduced. An import-export tax and various business taxes, such as a sales tax, were the principal sources of revenue.

Low economic growth is one of the economic challenges that Nepal is facing for a long time. Economic growth is taken as an increase in the productive capacity of the country which is measured annually. Meanwhile, taxes are a part of a country's income collected by government for which there is no reciprocal benefit provided to taxpayers. In a country like Nepal, an insufficient financial resource is a major constraint for economic development. The amount of fund that is being spent to achieve national objectives is more than the total revenue being generated. Because, of this, there is a huge gap between total expenditure and the total revenue that is being generated. The total expenditure of the country exceeds the total revenue

generated, at a faster rate. Government has to spend a lot of money to fulfill its responsibility towards its people. The responsibility may be either for security, health, education or other developmental activities. In each country, a lot of funds is spent by the public authority for the protection of common people and the creation of various socio-economic infrastructures. The expenditure of the Nepalese government is increasing year by year because of time, income in population, social progress, war or preparation for war, increase in price, national income, etc.

Taxation can be considered as a convenient method of raising revenue which in turn is linked with the welfare of the people and economic growth. Tax revenue is a very important instrument for the government to meet the planned expenditures and helps to achieve set growth targets over the years.

The neoclassical growth theory evaluates the correlation between taxation and growth and suggests that steady growth is not affected by tax policy. On the other hand, Solow model is one of the examples of exogenous theory which is propounded by Robert Solow in 1956 explained that government and taxation policies can have long or permanent growth effects.

1.2 Statement of the Problem

The prime concern of any nation is to attain economic growth and development. Nepal is considered underdeveloped country based on GDP as classified by World Bank. Over the period, researchers or economists have been interested in exploring the factors causing the country to grow at different rates and achieve different levels of wealth accumulation.

However, several economists agree is that taxation is one of the significant factors that determine the economic growth of the country. Taxation is one of the major instruments for the economic growth of the nation.

The government of Nepal introduced the concept of taxation in 1956 through national economic plans to fulfill the huge amount of government revenue required for the development activities. Taxes play a vital role in economy and they determine changes in national income and other macroeconomic variables. As a developing country, Nepal relies heavily on tax revenue for government funding. The changes in taxation have a considerable effect on the production and consumption level of such

goods and services. Hence, Nepal's taxation and its relationship with economic growth will provide insight into how changes in fiscal policy are likely to increase the pace of Nepal's economic growth. Thus, this study deliberates to seek the answer the following research questions:

a) What is the effect of tax revenue on economic growth in Nepal?
b) Is there any long-run and short-run relationship between tax revenue and economic growth rate?

1.3 Objective of the Study

The general objective of the study is to analyze relationship between tax revenue and economic growth. However, following specific objectives are selected in this study:

- To examine the trend of tax revenue in Nepal.
- To examine the effect of the tax revenue on economic growth of Nepal.
- To explore the long-run relationship of tax revenue with economic growth of Nepal.

1.4 Hypothesis of the Study.

The hypothesis of the study is as below :

Null Hypothesis (Ho): There is no significant relationship between tax revenue and economic growth.

Alternative Hypothesis (H_1): There is significant relationship between the tax revenue and economic growth.

1.5 Significance of the Study

Taxation, as a major fiscal policy instrument has an important role in the economic development of a country. The total tax revenue is divided into headings like direct tax and indirect tax. There are various research works done on the topic of economic growth, tax revenue and its trend but there are very few studies done to explore the relationship between tax revenue and economic growth.

Since the topic thus selected focuses on the Nepalese context and the study explores the link between tax revenues and economic growth and how the tax revenue can

impact economic development in the long run. This research will get information on whether to increase or decrease taxation to achieve higher economic growth. Thus, this study attempts to call government and policymakers to solve frequent changes in the taxation policy. For academicians, it will help to develop a new hypothesis and check existing hypotheses and theories, therefore it would be helpful to develop new theories and results.

1.6 Limitations of the Study

The study has the following limitations:

- This study has been conducted confining tax revenue in Nepal. Therefore, the general conclusion may not be applied globally.
- The research contains the data of economic growth and tax revenue from the year 1985/86 to 2018/19.
- There are numerous factors influencing the economic growth of a country, but the study is conducted by taking into account only tax revenue.
- Only 34 data sets are used to explain the relationship between the dependent variable and independent variable through the ARDL model.

1.7 Organization of the study

The study is divided into five chapters. The first chapter is the introduction that consists of the background of the study, the statement of problem, the objective of the study, the significance of the study, limitations of the study, and organization of the study. The second chapter is related to the review of the literature which includes the theoretical review of literature and empirical review of literature. It also includes the research gap. The third chapter deals with the research methodology which comprises research design, nature and scope of data, tools and technique of data collection and model specification. The fourth chapter comprises data analysis and presentation. And, the fifth chapter deals with the summary, conclusion ,and recommendations provided by the research.

CHAPTER II

REVIEW OF LITERATURE

This chapter deals with the theoretical and empirical concepts relating to the relationship between tax revenue and economic growth. Theoretical concepts deal with the theories that have been taken as a base on this study. Further, empirical studies cover the study carried out on this topic at national and international scenarios. This chapter also deals with the research gap that exists on this study.

2.1 Theoretical Review

There are various theories and frameworks that are being discussed by various academicians and researchers to investigate the relationship between tax revenue and economic growth. Classical taxation theory, Keynesian taxation theory, Neo-classical theory and Optimal taxation theory for taxation as well as, classical growth theory, exogenous growth theory and endogenous theory are discussed below:

2.1.1 Principles of Taxation

Classical Taxation Theory

Adam Smith is considered to be the father of the scientific taxation theory. "An Inquiry into the Nature and Causes of the Wealth of Nations" have a definition of taxation system focusing on the main conditions for the formation and put forward four main taxation principles: determination, convenience, equity, and thrift of taxation. Later, D. Ricardo, J.Mills, and W. Petty developed Smith's work and focused on one singular aspect: the provision of state revenues is achieves based on basis of the principle of equity and justice.

Keynesian Taxation Theory

John Keynes was a propounder of the Keynesian Taxation theory who advocated that government intervention is necessary for the processes of market economy regulations. One of the main assumptions in Keyne's theory is that economic growth is related to monetary savings only in conditions of full-employment. A large amounts of savings hinder economic development as they are considered to be a passive forms

of income and are unproductive. The theory suggests that with the help of government intervention the surplus savings must be lowered with the help of taxation.

Neo-classical Taxation Theory

J.Mutt and A.Laffer developed the neo-classical theory for taxation which differs from Keynesian taxation theory. The neo-classical theory assigns a passive role of the government in economic processes and focuses that taxation policy should be developed under the same assumption of no government intervention. According to the theory, taxes must be as small as possible and corporations should be granted significant tax exemptions. Otherwise, a tax burden would hinder the investment policies of the corporation and hinder economic growth. Arthur Laffer developed so-called Laffer curve which shows that an increase in the tax burden leads to an increase in state revenues only up to a level, where they start to decrease.

Optimal Taxation Theory

The theory of optimal taxation comprises choosing the tax that will maximize the welfare function of the society considering a given set of constraints. It involves designing and undertaking a tax that lowers inefficiency and distortion in the market equilibrium. In addition, if the first-best outcome is not feasible and you have to seek for the second-best then the design and implementation of the optimal tax requires knowing how to increase the number of outcomes from the heterogeneous population using socially optimal way (Yagan, Gregory, & Weinzierl, 2009)

2.1.2 Theories of Economic Growth

Many factors affect economic growth. From the time of classical economists to the present age, there are several views on economic growth. We have discussed theories of economic growth concerning the taxation.

Classical Growth Theory

One of the major propounders of classical growth theory is Adam Smith who discusses why some countries become poor and why some countries become rich. Other major economists of the classical era were David Ricardo, and J.S Mill. Classical economists discussed the process of growth in terms of technological progress of an economy and population growth.The classical theory believes that economic growth ends when the population increases due to the concept of a limited

resource. The theory believes that technological progress does not stand for long term. It can be concluded from the classical theory that output is a function of capital, labour force, land, and technology. Classical growth theory has greater significance to address the problems of underdeveloped economies.

Exogenous Growth Theory

Exogenous growth theory is also known as Neoclassical theory which evaluates the relationship between taxation and growth. Solow model is one of the examples of exogeneous growth theory which was pioneered by Robert Solow. He has observed that input of physical capital and labor does not contain all the information that helps to understand the size strength and growth potential of a specific society. Solow observed that economic output significantly depends on the economy's technological progress. He added technology in the production function equation as an exogenous variable. However, in the neoclassical framework, taxes imposed by the government have an impact on growth as if they affect the rate of savings and investment level. (Solow, 1956)

Endogenous Growth Theory

In endogenous growth theory, technology progress is seen as the key determinant of long-term economic growth. To overcome the limitations of exogenous growth theory, an endogeneous growth model was propounded where it instills the concept of increasing to scale. As far as fiscal policy is concerned, the theory states that spending and taxation should have both a temporary and permanent effect on the growth of the economy.

Tax will cause inefficiency and distortion in the product and labor markets, and the productive expenditure will affect the growth rate in the long term. (Barro, 1990).

2.2 Empirical Revenue

Gemmell, (1988) explored the relationship between taxation, savings, and growth. The study reviews empirical evidence on differences in tax systems and the operation between developed and least developed countries using 30 data sets. Also, it had examined the effects of taxation on economic growth in the LDCs (Least Developed Countries). The result concluded that tax systems in LDCs put greater reliance on indirect taxes relative to income taxes. Also, the study showed that taxation could

significantly positively influence the growth rate and LDCs would continue to rely on indirect tax.

D.Myles, (2000) reviewed the theoretical and empirical evidence to assess where the consensus arises as to how taxation affects economic growth. It is shown in his study that the rate of growth can be affected by policy choices through the effect that taxation has upon economic decisions and through productive public expenditures. The researcher has shown evidence that the economic growth effect of the tax is very weak. Also, he has failed to find a robust or significant relationship between tax rates and economic growth.

Chaido and Anastassiou, (2005) examined the relationship to find out the influences of economic growth upon savings, total tax revenue and taxes on income, gains on sales fixed capital of Greece. The study was based on secondary data. The time that was taken as a study period was from 1965 to 2002. The Autoregressive VAR model was used for further analysis. The result showed that there is one-way casual relationship between direct tax and economic growth.Also, there is no casual relationship between economic growth rate and the ratio of savings to GDP. Likewise, there is casual relationship between direct tax rates and economic growth.

Brender and Navon, (2010) examined the relationship of GDP with tax revenues and the sources of uncertainty in predicting government tax revenue in Israel. The study at the first stage estimated a model based on several real and financial macroeconomic variables and identified a significant stable and accurate relation between these variables and tax receipt. Engel-Granger method of cointegration was used. The result showed that GDP, imports of consumption goods, wage per employee post, new dwelling sales, sales of shares by parties of interest abroad, and credit denominated in foreign currency positively affects the tax revenue of Israel.

Taha, Colombage, and Nanthakumar, (2011) explored the effects of economic growth on government tax revenue in Malaysia. The data from 1970 to 2009 were used and further Johansen cointegration was applied to show the effect of the allocation of resources. However, the finding showed that there is a unidirectional relationship between economic growth and total government tax revenue with a 21% speed of adjustment in the short run to come back to equilibrium level in long-run. The major recommendation given by the study was that policymakers should be

considerate about the formulation of effective taxation policy and implementation in line with the dynamic nature of the Malaysian economy.

Stoilova and Patanov, (2012) studied basic trends of the distribution of tax burden in the European Union's member states and emphasized the impact of taxation on economic growth. The study is based on secondary data using the data from 1995 to 2010 where the comparative analysis is done focusing on cross country differences in terms of the tax burden, measured by tax to GDP ratio and also design of tax structure. Regression analysis is used for the study where it is concluded that tax structure based on direct taxes is more efficient in terms of economic growth.

Dackehag and Hansson, (2012) examined the effect of government size and taxation of income on economic growth. The study focused on how statutory tax rates on corporate and personal income affect economic growth by using panel data from 1975 to 2010 for 25 rich OECD countries. Correlation analysis was done for further study. The result showed that corporate income taxation and personal income negatively influence economic growth. And the correlation between corporate income taxation and economic growth is more robust.

Yaya, (2013) investigated the relationship between taxation and economic growth in Cote D'lvoire for which data from 1961 to 2006 were used and a two-stage modeling technique was done. The study results concluded that increases in tax burden and the share of direct tax to total tax revenue are strongly associated with the decrease in economic growth. Furthermore, the study estimated a growth maximizing tax structure over the sample period and the result showed that a move to a growth maximizing tax structure would generate an increase in real GDP but would yield a reduction in tax revenues.

Thomas, (2014) examined the relationship between taxes and economic growth. The study used regression analysis in the statistics gathers from public available sources from fifty US states. Ten years of study period have been taken into consideration. The findings showed that there exists a relationship between taxes and economic growth but that the relationship is not consistent or consistently significant. Further, the study concluded that economic and social factors are more important in understanding economic growth.

Gale, Krupkin, and Rueben, (2015) studied the effects of state tax policy on economic growth, entrepreneurship, and employment. Regression analysis was done by taking the data from the period 1977 to 2006. The study result showed that neither tax revenues nor top income tax rates bear stable relations to economic growth or employment across states and over time. The rate of firm formation is negatively affected by income tax rates and there is very low effect on economic growth.

Takuma and Iyke, (2015) explored the causal influence between economic growth and tax revenue in Ghana. The study estimated the test statistics of the Granger causality based on secondary data using the period of 1986 to 2014. The study concluded that there is a unidirectional causal flow from tax revenue to economic growth in Ghana and taxation can influence economic growth. According to the study, since Ghana is a net burrower and has budget deficits, it is necessary to implement policies that enhance the tax scope in order to increase revenue through taxation.

Riba, (2016) studied the impact of taxes in general and across the major three types, personal income tax (PIT), corporate income tax (CIT), and VAT on economic growth in South Africa. The study used data from 2003 to 2019 and employed the autoregressive distributed lag (ARDL) model cointegration framework to examine the long-run relationship between taxation and economic growth. The result showed that there exists long-run equilibrium and a positive relationship between taxes and growth where an increase in VAT leads to the increase in growth and increase in PIT and CIT stimulated economic growth in South Africa.

Iriqat and Anabtawi, (2016) investigated the causality relationship between GDP and tax revenue in developing countries as a case of Palestine. The study is based on secondary data and followed an granger-causality approach considering the data from 1999 to 2014. The result showed that there is a positive impact of each of variables like, GDP, government spending and consumption on tax revenue in the first stage. Whereas, there is a negative impact of balance of trade on tax revenue. Moreover, the result points out that there is no significant impact of GDP and its components on tax revenue in the third stage. There are different results in each stage because of many reasons such as political instability and changes in income tax act of Israel. The study recommended that authority should motivate investment conditions, improve tax collection instruments and decrease tax invasion.

Ahmad and Sial, (2016) empirically investigated the relationship between tax revenues and economic growth in Pakistan where the main purpose was to find the long-run and short-run relationship between total tax and economic growth. The study was based on annual time series data from 1974 to 2010. The result concluded that in long run, total tax revenue has negative and significant effects on economic growth. Also, the total speed of adjustment is 51% in a year. The study recommended that it is important to decrease the indirect taxes and increase the direct taxes, for economic growth.

Venkataraman and Urmi, (2017) explored the impact of taxation on economic growth in India by using time series data from 1977 to 2015. The autoregressive distributed lag (ARDL) bound test approach to cointegration was used. The study found that components of direct taxes, personal income tax had no impact on economic growth in the long run while corporate income tax had a positive and statistically significant impact on economic growth. Further, excise duty had also no impact on economic growth while custom duty had a positive and significant impact. Therefore, it was concluded that policymakers must target necessary tax components to be used as a tool in influencing long term economic growth.

Babatunde, Ibukun, and Oyeyemi, (2017) investigated the impact of taxation on economic growth in Africa, using the data from 2004 to 2013. The study applied a regression model which concluded that there is a positive and significant relationship between tax revenue and economic growth in Africa. Therefore, high and weak levels of taxation are favorable to economic growth as upheld by the economic effects which approved the positive impact that lower tax rates have on work, output, and economic performances. The study recommended that the government should be ready to develop a comprehensive tax structure or model that will grow, nurture and sustain its tax economic base to drive economic performances.

Olufemi, Jayeola, Oladele, and Naimot, (2018) examined the relationship between tax revenue and economic growth in Nigeria. The study was based on secondary data and had adopted descriptive and historical research design. The data from 1994 to 2015 had been taken into consideration and the ARDL model was used for further analysis. The result showed that the VAT and Customs & Excise Duties had a significant relationship with economic growth. However, Petroleum Profit Tax had no

significant relationship with economic growth. The study concluded that taxation remains a strong socio-political and economic tool for economic growth.

Kalas, Mirovic, and Milenkovic, (2018) studied the relationship between taxes and economic growth of Serbia and Croatia in the period 2007 to 2016. In order to explore their relationship and identify the impact of tax on economic growth, panel regression was used. The result showed that corporate income tax, VAT and social security contribution have a positive impact on economic growth while excise duties affect GDP negatively. However, it has been concluded that VAT has a statistically significant impact on economic growth in the two countries, with each increase in revenue from tax contributions to the growth of GDP in the given period.

Egbunike, Emudainohwo, and Gunardi, (2018) explored the effect of tax revenue on the economic growth of Nigeria and Ghana. The study used multiple regression as tool of analysis. The study is based on secondary data of 17 years from 2000 to 2016 which was retrieved from the central bank of Nigeria, statistical bulletin, and Bank of Ghana. The conclusion showed that there is a positive impact of tax revenue on the gross domestic product of Nigeria and Ghana. Thus, the recommendation includes that adequate measures should be ensured to generate revenue from tax which is effective for an economic growth of the country.

Khumbuzile and Khobai, (2018) investigated the impact of taxation on economic growth in South Africa. The study is based on secondary data from the period 1981 to 2016. For the analysis, the autoregressive distributed lag model (ARDL) was used. The result confirmed that there exists a negative relationship between taxes and economic growth in South Africa. The findings also includes that economic growth, trade openness, capital, and taxes are co-integrated. The paper suggests that fiscal policy is very important to force sustainable economic growth in South Africa.

Maharjan, (2018) explored the relationship between economic growth and tax revenue in Nepal taking 43 years of annual time series data from 1974 to 2017. Engle-granger's cointegration approach had been applied for the data analysis. The result showed that there exists long-run relationship between tax revenue and economic growth in Nepal with the non-tax revenue as a control variable. Further, the annual speed of adjustment for disequilibrium to equilibrium is 34.3 percent. The impact of

tax revenue on economic growth could be a good motivation for the policymakers to increase the collection of revenue.

Adhikari, (2018) examined the contribution of income tax in revenue generation and collection. The study is based on secondary data from the period 2011- 2017. The descriptive research design was used to analyze and estimate income tax to revenue generation. The study concluded that income tax is a major tool of revenue collection and has a positive impact on GDP. Also, the income contribution of income tax revenue is not sufficient to generate funds of tax revenues and it is necessary to increase the share of direct tax through an effective and efficient taxation system.

Fahim and Bourdane, (2019) explored the impact of taxation on Moroccan economic growth. The study is based on an ARDL model, on the time series from 1981 to 2017. The study used variables such as direct tax, indirect tax, investment, and trade openness. The result showed that direct and indirect taxation have a negative effect on economic growth in the short run. Whereas in the long run, direct taxation has a positive effect and indirect taxation has negative. Also, in the short run, investment variable has a negative impact on growth but over time the effects become positive. Trade openess on the other hand has a positive and significant impact on economic growth.

Nwanakwere, (2019) investigated the relationship between economic growth and tax. The study followed ARDL bound test approach. The researcher decomposed tax into company income tax (CIT), petroleum profit tax (PPT), value-added tax (VAT), and excise & custom duties (ECD). They examined the effect of each variables on economic growth. The time period from 1984 to 2014 was taken into consideration. The result showed total tax revenue is insignificant. PPT and VAT has positive relationship, while on the other hand company income tax and ECD has a negative relationship with GDP.

Gurdal, Aydin, and Inal, (2020) studied the relationship between, government expenditure, and economic growth among G7 countries including Canada, France, Germany, Italy, Japan, UK, and the USA. The study is based on secondary data from 1980 to 2016 and used two different panel causality approaches to compare data. The result showed there is unidirectional casuality between tax revenue and government expenditure. Furthermore, there is no causal relationship between economic growth

and tax revenue. On the other hand, the study showed there are bidirectional short and long run causality between economic growth and tax revenue.

Kautish and Shrestha, (2020) examined the impact of government revenues and economic growth in Nepal for five years from 2013 to 2018 by using economic growth as a dependent variable and direct tax revenue, indirect tax revenue and non-tax revenue as a independent variables. The study used regression and correlation analysis which concluded that there is a positive relationship between different types of government revenue and economic growth. However, indirect tax revenue and non-tax revenue positively impact economic growth while direct tax revenue impacts economic growth positively but it is insignificant.

Dahal, (2020) studied the condition of the Tax-to-GDP ratio and also explored the relation of tax revenue with Nepal's GDP. The study is based on secondary data collected from various published sources. Descriptive and exploratory research designs, statistical, and econometric tools like mean, dispersion, correlation, Johansen Co-integration Test, Vector Error Correction model (VECM), have been used for the analysis of the data. The result showed there is a correlation between tax revenue and GDP or they have a long run relationship. Also, the study concluded that, tax-to-GDP of Nepal lies in the high rank among the various developing countries which alone cannot ensure the economic growth. The study recommended that it is necessary for authorities to increase income sources to increase tax revenue.

2.3 Research Gap

The international review of the existing empirical literature on the impact of taxation on economic growth by (Gemmell, 1988), (Brender & Navon, 2010), (Riba, 2016), (Babatunde, Ibukun, & Oyeyemi, 2017), (Kalas, Mirovic, & Milenkovic, 2018) (Adhikari, 2018),(Kautish & Shrestha, 2020) show a positive relation. Whereas the study that were done by (Dackehag & Hansson, 2012), (Ahmad & Sial, 2016) (Khumbuzile & Khobai, 2018), (Egbunike, Emudainohwo, & Gunardi, 2018), (Fahim & Bourdane, 2019) show the negative relationship between tax revenue and economic growth. Likewise, (D.Myles, 2000), (Thomas, 2014) (Gale, Krupkin, & Rueben, 2015) (Iriqat & Anabtawi, 2016) (Gurdal, Aydin, & Inal, 2020), (Kautish & Shrestha, 2020) in their studies show that there is absolutely no or inconsistent relationship between tax revenue and economic growth. For the casuality study between tax

revenue and economic growth, the studies done by (Chaido & Anastassiou, 2005), (Taha, Colombage, & Nanthakumar, 2011), (Takuma & Iyke, 2015) show that there exists a unidirectional relationship between tax revenue and economic growth. (Stoilova & Patanov, 2012), (Yaya, 2013), in their research found out that direct tax is more efficient in terms of economic growth. And, according to the researchers (Venkataraman & Urmi, 2017) VAT, excise duties have no impact on economic growth but corporate and custom duties have positive and significant relationship. Whereas the study conducted by (Olufemi, Jayeola, Oladele, & Naimot, 2018) shows VAT, customs and excise duties have a relationship with economic growth. (Maharjan, 2018) in his study shows that there is a long run relationship between the economic growth and taxation.

Numerous studies have revealed the relationship between tax revenue and economic growth. The previous empirical studies found different and disaggregated results. With the dissimilar findings in the previous studies and for the fact that very few researches have been done in Nepalese context, there is a need to further investigate the short run as well as long run relationships between tax revenue and economic growth in Nepal. So, this study tries to explore the short run and long run relationship between tax revenue and economic growth covering the time period of 1985 to 2019.

CHAPTER III

RESEARCH METHODOLOGY

This chapter includes the research methodology that is used in the research study. It includes the research design, sources of data collection, and econometric tools used in the study. The chapter deals with the methodology used in the study to meet the research objectives.

3.1 Research Design

The main objective of the study is to find the relationship between tax revenue and economic growth. To achieve the objectives, different techniques have been employed. The study is based on quantitative as well as qualitative analysis. Under the quantitative technique, Autoregressive Distributed Lag Model (ARDL) is used to determine the relationship between the tax revenue (TR) and economic growth. And the economic growth is measured by Real Gross Domestic Product (RGDP). Also, the study is based on certain research methodology consisting of unit root test and a cointegration test.

3.2 Nature and Sources of Data

To achieve the targeted objectives of the study, secondary data have been used. The nature of the study is descriptive as well as analytical. Under quantitative analysis, the research is conducted to analyze the relationship between tax revenue and economic growth using the ARDL model. And under qualitative, the trend of tax revenue is analyzed using a graph. The main sources of data for this study are extracted from, Economic Survey and Indicators from Nepal Rastra Bank and Ministry of Finance (MoF).

3.3. Tools and Techniques of Data Analysis

In order to analyze the relationship between tax revenue and economic growth, time-series data is taken from various sources published by the Government of Nepal. The study relies on the time series data collected from 1985 to 2019. To check whether the data is stationary or not, the Augmented Dickey Fuller (ADF) test of unit root test is used. Once variable's individual stationarity is checked, it is necessary to find the

cointegration of the variable. For cointegration, the Auto Regressive Distributed Lag (ARDL) model method of cointegration is used.

The Description of Variables.

Real Gross Domestic Product (RGDP) is the inflation-adjust monetary value of all currently produced final goods and services from every producing unit within the geographical territory of a country during the period of time. The study has used the RGDP as a dependent variable and it will be tested to see if it has a relationship with the tax revenue. Sample values are obtained from the Quarterly Bulletine of Nepal Rastra Bank.

3.4 Analysis and Presentation of Data.

To show the relationship of tax revenue to the real GDP, ARDL bounds testing approach is done. Before starting the regression analysis, it is essential to check whether the data is stationary or non-stationary. To conduct the stationarity test, Augmented Dickey-Fuller (ADF) is used. Also, Heteroskedasticity, LM Correlation test, and Normality tests, CUSUM & CUSUMQ tests are carried out through E-views software.

3.5 Test of Stationarity

In any time series data, it is essential to test whether there is a presence of unit root or not. There are three models of testing ADF, they are (i) Intercept only (ii) Trend and Intercept, and (iii) None. The data of tax revenue and RGDP has been plotted in the graph with respect to time. The graph showed the presence of trend and intercept. Therefore, the study is based on the second model that is intercept and trend. Thus the unit root test has been done through E-VIEWS software.

Unit Root Test

To check the stationarity of the variables, unit root test is adopted. If series has mean and variance constant over the period of time then we can say that data is stationary. So it is necessary to study the time series property of the variables. This is done to find out the level of stationarity of the variables either level or the first difference. If non-stationary variables are regressed then there can be the problem of spurious

regression (Granger & Newbold, 1974). ADF is the most popular test among other tests (Elder & Kennedy, 2001). The ADF is a better approach to check whether the data sets are stationary or not because of its capacity to remove auto correlation from the model due to adjustment of lags.

In equations (1) and (2) below the series of interest is X_t. The symbol Δ indicates the first difference of the series X_t, t in equations is a time trend, and p is the number of lagged variables that are used to ensure the error term e_t is white noise. The optimal number of lags can be determined in various ways, Akaike Information Criterion (AIC) is used for the estimated coefficients of these lagged variables.

$$\Delta X_t = \alpha_1 + \gamma_1 X_{t-1} + \sum_{i=1}^{p} c_{1i}\, \Delta X_{t-1} + e_{1t} \ldots\ldots\ldots\ldots\ldots\ldots (1)$$

$$\Delta X_t = \alpha_2 + \gamma_2 X_{t-1} + \beta_t + \sum_{i=1}^{p} c_{2i}\, \Delta X_{t-1} + e_{2t} \ldots\ldots\ldots\ldots\ldots (2)$$

The equation (1) hypothesis indicates the series is a mean stationary and equation (2) indicates the series is trend stationary. Here, p is the lags. The ADF technique tests the null hypothesis $\gamma_1 = 0$, against the alternative hypothesis $\gamma_1 < 0$. The rejection of the null hypothesis is an indication that the series X_t is stationary.

The major issues in performing the ADF test are the inclusion of the intercept, trend & intercept and none. The research's stationarity is checked based on intercept as well as trend and intercept.

3.6 Cointegration

The reason being that cointegration is a powerful way of detecting the presence of steady-state equilibrium between variables. Cointegration has become an over-riding requirement for any economic model using non-stationary time series data. In the case where the variables are non-stationary at levels but are difference stationary, cointegration methodology allows researchers to test for the presence of long-run equilibrium relationships between economic variables. If the separate economic time series are stationary after differencing or they are integrated of order one, but a linear combination of their levels is stationary, then the series is said to be integrated.

There are several methods for investigating the cointegration, among which ARDL bound testing approach to cointegration is one of the approaches which was developed by Pesara et al (2001). Tests for cointegration seek to investigate whether a

long-run relationship exists among such a set of variables. In this research ARDL approach of cointegration is applied.

There are at least three broad approaches for testing cointegration. The first one is Engle and Granger method which is based on assessing whether single-equation estimates of the equilibrium errors appear to be stationary. The second one is known as Johansen cointegration, which is based on the Vector Auto Regressive (VAR) approach and determine the rank of coefficient matrix. The third one is bound testing which is based on Autoregressive distributed lag (ARDL) model

In all the approaches the first step involves testing the variables for stationarity and thereby determine their order of integration using ADF and other relevant testing procedure. By default, one call upon cointegration when variables are not stationary. If variables are stationary and there is a simultaneity problem we adopt VAR models. We can also use VAR when they are stationary after differencing but there is no cointegration.

The Johansen procedure of testing cointegration requires that all variables be integrated in the same order which may not possible all the time. Pesaran, Shin, and Smith (2001) have developed an alternative method commonly known as bounds testing which is based on ARDL model. It does not require the variables with the same order of integration. Moreover, it is considered a more appropriate method when the sample size is small as opposed to Johnsen cointegration which requires a large sample. It is easy to implement and interpret since it depends only in single equation.

Tests for cointegration seek whether a long- run relationship exists among such a set of variables. In other words, two or more I(1) series are said to be cointegrated if some linear combination of them is stationary. If given X_t and Y_t are integrated of order one I(1) or are stationary at difference, they are said to be cointegrated if there exists a parameter alpha (a) such that $u_t = Y_t - aX_t$ is a stationary process or is integrated of order zero I(0). In this research ARDL approach of the cointegration is applied.

3.6.1 Autoregressive Distributed Lag Model (ARDL) to Cointegration Analysis

One of the approaches to check the cointegration among the variables is ARDL bound test. (Pesaran, Shin, & Smith, 2001). This test has several advantages over the well-known residual-based approach proposed by Engle and Granger (1987) and the maximum likelihood-based approach proposed by Johansen and Julius (1990) and Johansen (1992). ARDL model is used to examine the short-run and long-run effects of tax revenue on economic growth. The advantages of ARDL model can be stated as:

- ARDL procedures are a statistically more significant approach to determine the cointegration relation in small samples.
- ARDL can be applied irrespective of whether underlying regressors are purely I (0), purely I (1), or mutually cointegrated.
- The ARDL procedures allow that the variables may have different optimal lags, while it is impossible with conventional cointegration procedures.
- The ARDL technique generally provides unbiased estimates of the long-run model and validates the t- statistics even when some of the regressors are endogenous.
- The ARDL procedure employs only a single reduced from the equation, while the conventional cointegration procedures estimate the long-run relationship within the context of system equations.

Following the ARDL approach proposed by Pesaran and Shin, the existence of a long-run relationship could be tested using the equation below. Hence the general ARDl (p,q) model is :

$$\Delta Y_t = \beta_0 + \gamma_0 Y_{t-1} + \gamma_1 X_{t-1} + \sum_{i=1}^{p} \beta_i \Delta Y_{t-1} + \sum_{i=0}^{q} \alpha_i \Delta X_{t-j} + \varepsilon_t \ldots\ldots\ldots\ldots (3)$$

From the equation, Y_t is a dependent variable; X_t is an independent variable in the model. β, γ are the coefficients to be estimated and ε_t is the error term. From the general model proposed by Pesaran and Shin, the ARDL for the study can be specified as,

$$\Delta LOGRGDP_t = \beta_0 + \gamma_0 LOGRGDP_{t-1} + \gamma_1 TR_{t-1} + \sum_{i=1}^{p} \beta_i \Delta LOGRGDP_{t-1} + \sum_{i=1}^{q} \alpha_i \Delta LOGTR_{t-1} + \epsilon_t \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (4)$$

From the equation, β_0 is the intercept, γ_0 and $\gamma_{1,}$ are the long-run coefficients and β_i and α_i represent the short run dynamics, Δ is the first difference, p and q are the optimum lag length and ϵ_t represents random disturbance term. The summation indicates the short-run equation. The ARDL bound test can be employed to establish the existence of long-run relationship among the variables.

3.6.1.1 Selection of Lag Length

After checking the unit root test, the next step is to use the ARDL approach to check if there is any long-term relationship between the series or not. It is essential to choose the appropriate lag length before applying ARDL bound test. There are several criteria for choosing optimal lag length in a time series: Akaike Information Criterion (AIC), Schwartcz Information Criterion (SIC), Hannan- Quinn Criterion (HQ), Root Mean Square Error (RMSE), Mean Absolute Error (MAE), etc.

Akaike information criterion is superior to other criterion studies in the case of small samples that is 60 observations and should be a better choice for the smaller sample. (Liew, 2004). For the confirmation that the lag length is chosen appropriately, the Akaike information criterion (AIC) will be used as the sample size is small.

3.6.1.2 ARDL Bounds Testing Approach

The ARDL long-run equilibrium relationship is established from the overall test of significance of the lags of all the variables in the levels form. The study tests the significance of F-statistics. The study tests the hypothesis of the existence of no long-run equilibrium relationship against the alternative hypothesis of the presence of a long-run equilibrium relationship among the variables. Following the ARDL approach proposed by Pesaran and Shin, long-run relation could be tested by the equation.

$$\Delta LOGRGDP_t = \beta_0 + \gamma_0 LOGRGDP_{t-1} + \gamma_1 TR_{t-1} + \sum_{i=1}^{p} \beta_i \Delta LOGRGDP_{t-1} + \sum_{i=0}^{q} \alpha_i \, \Delta LOGTR_{t-1} + \epsilon_t \quad \ldots\ldots (5)$$

From the equation, the hypothesis to be tested can be written as,

$H_0: \gamma_0 = \gamma_1 = 0$ (No cointegration exists)

$H_1: \gamma_0 \neq \gamma_1 \neq 0$ (Cointegration exists)

The study then compares the estimated F-statistic value to the upper and lower bounds critical values generated by Pesaran et al (2001). According to Pesaran (1997), the bounds test can be used to test the long-run relationship in the above equation. If the calculated F-statistic exceeds their the critical values, it can be said that there is a cointegration. That is, there is a long run relationship. Under this the null hypothesis is rejected and the long run model which is the error correction model (ECM) is estimated. If the test statistics is lower than the lower critical value for lower bound I(0), the we conclude that there is no cointegration, hence no long run relationship. In this case, we do not reject the null hypothesis and estimate the short run model which is the autoregressive distributed lag model (ARDL). And, if it lies between the bound, a conclusive inference cannot be made without knowing the order of integration of the underlying variables.

3.6.1.3 Error Correction Model

Error Correction model is used to check the long-run relationship among the variables.The concept of cointegration is associated with a theorem called Granger representation theorem which states that two variables are cointegrated of and only if there exists an error correction model for either of the two variables or both. (Bjornland & Thorsrud, 2014). If the variables are cointegrated that means they have long-run relationship between them. The short-run coefficients from the model are expressed by finding the error correction model.

Even if Y_t and X_t variables are cointegrated that means they have long run relationship between them, there may be disequilibrium in the short-run. Thus, the error term $u_t = Y_t - \beta_1 - \beta_2 X_t$ in the regression equation $Y_t = \beta_1 + \beta_2 X_t + u_t$ is called the equilibrium error. This error term is used to tie the short run behavior of Y_t to its long-run value. The granger representation theorem says if two variables Yt and Xt are cointegrated, then the relationship between the two can be expressed as error correction modeling as:

$\Delta Y_t = \alpha_0 + \alpha_1 \Delta X_t + \alpha_2 u_{t-1} + \varepsilon_t$ ……..(6)

ε_t = A white noise error term.

The equation can be further written as ,

$\Delta Y_t = \beta_1 + \beta_2 \Delta X_t + \varphi ECT_{t-1} + \varepsilon_t$ …….(7)

The ECM in equation states that, ΔY_t depends on ΔX_t and on equilibrium error term. If the error term is non zero, the model is out of equilibrium. Here the value of φ decides how quickly the equilibrium is restored. The error term has to be negative and significant. The negative error correction term means that the variables will return to equilibrium with any deviation from the long run.

3.7 Model Specification and Hypothesis

The general objective of the research is to explore the relationship between economic growth and tax revenue in Nepal. Many other variables that affect the economic growth of a country. The study has only taken tax revenue as an independent variable. Based on selected variable and theoretical framework, the general model can be given by,

RGDP = f (TR)……..(i)

The equation can be arranged in a linear form as,

$RGDP = \beta 1 + \beta 2.TR + u_t$……..…….....(ii)

Here, β2 measures the effect in the per unit changes of the independent variables on the dependent variables.

By placing natural logarithms on both sides, the equation can be expressed in its natural log form as:

$LOGRGDP = \beta 1 + \beta 2.LOGTR + u_t$ ……(iii)

Where, LOGRGDP = natural logarithm of real GDP (Dependent variable)

LOGTR= natural logarithm of tax revenue (Independent variable)

β1= Constant; β2= slopes of the independent variable or regressor.

u_t= stochastic disturbance term.

The ARDL equation for the study can be written as :

$$\Delta LOGRGDP_t = \beta_0 + \gamma_0 LOGRGDP_{t-1} + \gamma_1 TR_{t-1} + \sum_{i=1}^{p} \beta_i \Delta LOGRGDP_{t-1} + \sum_{i=1}^{q} \alpha_i \Delta LOGTR_{t-1} + \epsilon_t \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \text{(iv)}$$

From the equation, β_0 is the intercept, γ_0 and γ_1, are the long run coefficients and β_i and α_i represent the short run dynamics, Δ is the first difference, p and q are the optimum lag length and ϵ_t represents random disturbance term. The summation indicates the short run equation. The ARDL bound test can be employed to establish the existence of long run relationship among the variables.

To investigate the existence of long run equilibrium between variables, bound tests approach developed by Pesaran et al. (2001) has been employed. Before the bound test approach is employed, optimal lag selection through E-view on the basis of Akaike Information Criterion (AIC) has been done. Under the bound test approach, the null hypothesis and alternative hypothesis are stated as:

$H_0: \gamma_0 = \gamma_1 = 0$ (No cointegration exists)

$H_1: \gamma_0 \neq \gamma_1 \neq 0$ (Cointegration exists)

Pesaran et al. (2001) provide two sets of critical values which are lower critical bound and upper critical bound which tests F statistics. If the calculated F-statistics is below lower bound, we accept null hypothesis can we can conclude that there is no long run relationship between variables. Similarly, if the calculated F-statistic is higher that the upper critical values we cannot reject the null hypothesis of cointegration and conclude there exists long run relationship. And the calculated value lies between the bound, a conclusive inference cannot be made without knowing the order of integration of the underlying variables.

The Error Correction Model (ECM) based on the assumption made by Pesaran et al. (2001) was also employed for the short-run dynamics of the model. The error correction version of ARDL model for the study can be expressed as:

$$\Delta Y_t = \beta_1 + \beta_2 \Delta X_t + \varphi ECT_{t-1} + \varepsilon_t \ldots\ldots\ldots\ldots\ldots\ldots \text{(v)}$$

Thus the equation states that, ΔY_t depends on ΔX_t and on equilibrium error term. If the error term is non zero, the model is out of equilibrium. Here the value of φ is a adjustment coefficient which decides how quickly the equilibrium is restored. The error correction term has to be negative and significant. The negative error correction term means that the variables will return to equilibrium with any deviation from the long run. Here, the error term thus defined as

$$ECT_t = \text{LOGRGDP}_t - \beta_1 \text{TR}_t \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\text{(vi)}$$

The error correction coefficient is expected to be less that zero and implies the cointegration relation. To check the performance of the model the diagnostics tests like serial correlation, heteroskedasticity are conducted.

3.8 Residual Diagnostic and Stability Test

The residual diagnostic test like Serial correlation, Heteroskedasticity and Normality test are carried out. To check the stability, CUSUM and CUSUMSQ test are also carried out.

Serial Correlation LM Test

The correlation of the residual series is called serial correlation. The null hypothesis of the serial correlation LM test is that there is no serial autocorrelation. The alternative hypothesis is there is serial autocorrelation in the model.

Heteroskedasticity Test

Heteroskedasticity exists when values of variance of the random term are different for different observations. The null hypothesis of the heteroskedasticity test is that there is no heteroskedasticity in the residual series of the model. The alternative hypothesis is there is heteroskedasticity in the model. If there is no heteroskedasticity, then the model is considered better.

Normality Test

The null hypothesis of the test is that the residual series of the model is normally distributed. If the residuals are normality distributed, then the model is considered better. In this study, the Jarque-Berra (JB) test is performed to check whether the

residual series are normality distributed. If Jarque-Berra is greater than probability then, series is normally distributed.

CUSUM AND CUSUMSQ test

CUSUM helps to show if coefficients of regression are changing systematically (Bhatti, Hatem, & Hossain, 2006).

The stability of the long-run parameters together with short-run movements for the estimated equations should be examined. For this the thesis relied on the cumulative sum of recursive residuals (CUSUM) and cumulative sum of squares of recursive residuals (CUSUMSQ) tests proposed by Borensztein et al. (1998).

The CUSUM test is based on a plot of the sum of the recursive residuals. If this sum goes outside a critical bound, one concludes that there is a structural break at the point at which the sum begins its movement toward the bound. The CUSUM-OF-SQUARES test is similar to the CUSUM test, but plots the cumulative sum of squared recursive residuals, expressed as a fraction of these squared residuals summed overall observations.

The CUSUM and CUSUMSQ plotted line should be within the border. The model is considered to be unstable if the plotted line crosses the borderline at the 5% level of significance.

CHAPTER IV

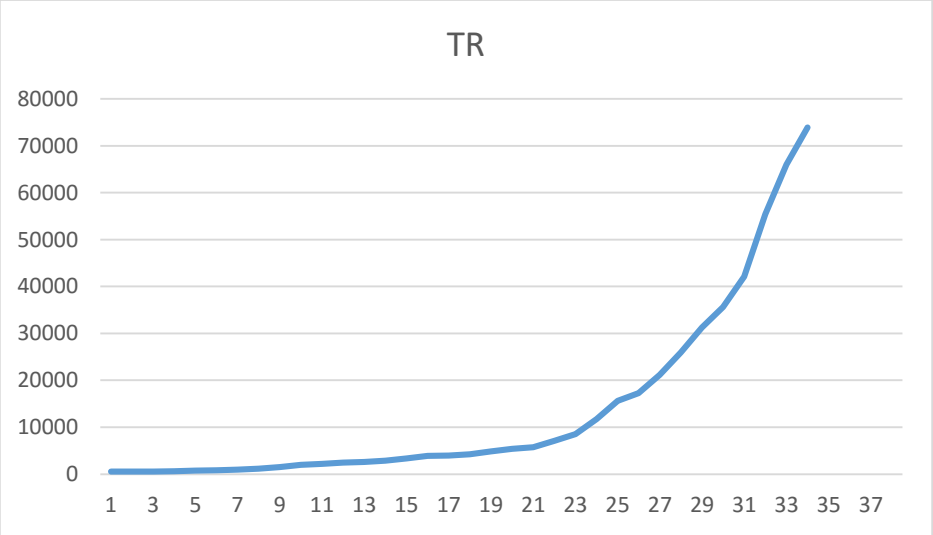
PRESENTATION AND ANALYSIS OF DATA

The chapter deals with the analysis of the relationship of tax revenue and economic growth. Also, the analysis of the trend and composition of tax revenue is presented. The analysis is performed by organizing and assessing through graphs and tables.

4.1 Trend and Composition of Total Tax Revenue in Nepal

Tax revenue is divided into direct tax and indirect tax. A direct tax is imposed upon the income or property of people. A direct tax is paid by the person on whom it is legally imposed. Income tax, property tax, gift tax, vehicle tax are the constituents of direct taxes. On the other hand, indirect tax is imposed upon any person without direct collection but is imposed on a person partially or wholly. And indirect tax constitutes Sales tax, VAT, Entertainment tax, customs duty, excise duty, etc. The below table shows the contribution of different constituents to the total tax revenue.

Figure 4.1 Trend of Tax Revenue



Source: Researcher's calculation through Excel

Table in Appendix A shows the composition of tax revenue. The tax revenue is divided into direct tax and indirect tax. The table consists of income tax revenue, excise and customs duties, Sales tax /VAT, and other taxes. Income tax, the most important component of direct taxes, increased substantially during the study period.

The income tax rose from the amount Nrs.364.4 million in FY 1985/86 to Nrs.171932.2 million in FY 2018/19.

Sales tax/ VAT, the most important component of indirect tax also increased substantially. The revenue from sales tax and VAT increased from 1173 million in FY 1985/86 to 232932.8 million in 2018/19. The revenue from excise duties, on the other hand, increased from Rs. 558.7 million in FY 1985/86 to 112383.2 million in FY 2018/19. Due to the exclusion of imported goods from the excise net, and exclusion of most of the domestic goods from the excise net, the contribution is relatively low now. Among the components of taxes, the contribution of custom duties was Nrs. 1231 million in FY 1985/86 to Nrs.162654.3 million in FY 2018/19. Other taxes consists of house & land tax, interest tax, rent tax, etc which also has an increasing trend during the study period. Overall, the trend of tax revenue seems to be increasing throughout the study period.

4.2 Descriptive Statistics

The descriptive analysis helps to organize, display, summarize and describe the collected data and information in a meaningful way. The dependent variable is LOGRGDP while the independent variable is LOGTR. It allows presenting raw data applying to the entire population. There are two main concepts to understand descriptive statistics that are the nature of variables and distribution.

Table 4.1 : Descriptive Statistics

	LOGTR	LOGRGDP
Mean	8.483308	10.77183
Median	8.296688	10.76965
Maximum	11.11623	12.67681
Minimum	5.902442	8.625761
Std. Dev.	1.535219	1.187543
Skewness	0.134400	-0.090177
Kurtosis	1.965760	1.956243
Jarque-Bera	1.617700	1.589440
Probability	0.445370	0.451708
Sum	288.4325	366.2423
Sum Sq. Dev.	77.77760	46.53856
Observations	34	34

Source: Researcher's own calculation through E-views.

As shown in Table 4.1, there are 34 observations used in this study. The average tax revenue is 8.48. The standard deviation is 1.53 which means the values are not spread out. This may also be seen from maximum and minimum values which are not that far from each other. The average real GDP is 10.7718. And the standard deviation is 1.187543 which indicates that the values do not vary that much. Tax revenue has a positive skewness and RGDP has negative skewness.

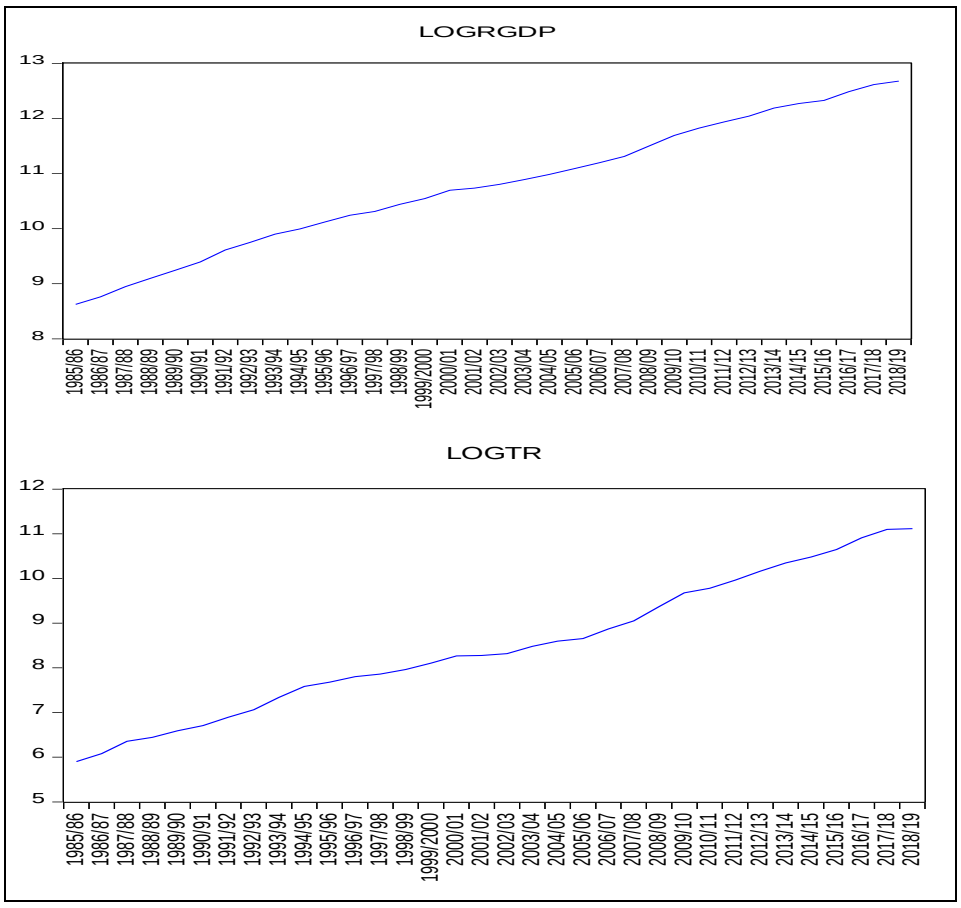
4.3 Test of Stationarity

In any time series data, it is essential to test whether there is a presence of unit root or not. Thus the unit root test has been done through E-VIEWS software.

4.3.1 Unit root test

In order to determine the short-run and long-run relationship between tax revenue and economic growth (measured in Real GDP), we have to check on the integration of the variables. Before testing the stationarity of the data, it is better to see the nature of the data. The nature of the data is given in Figure 4.2.

Figure 4.2 : Graphs of LOGRGDP and LOGTR



Source : Researcher's calculation through E-Views.

Figure 4.1 shows the graphical representation of the variables that are used in the study in their logarithm form. In the figure, LOGRGDP and LOGTR are non-stationary because each of them has an increasing trend over the period. The graph only helps to show the general properties of time series data. Now, it is necessary to conduct a stationarity test of the data by using econometric tools. In the study, Augmented Dickey-Fuller (ADF) test is used to test the unit root of the data. The result of the ADF test can be shown in Table 4.3.

Table 4.2 : Augmented Dickey-Fuller (ADF) test to test Integration Order.

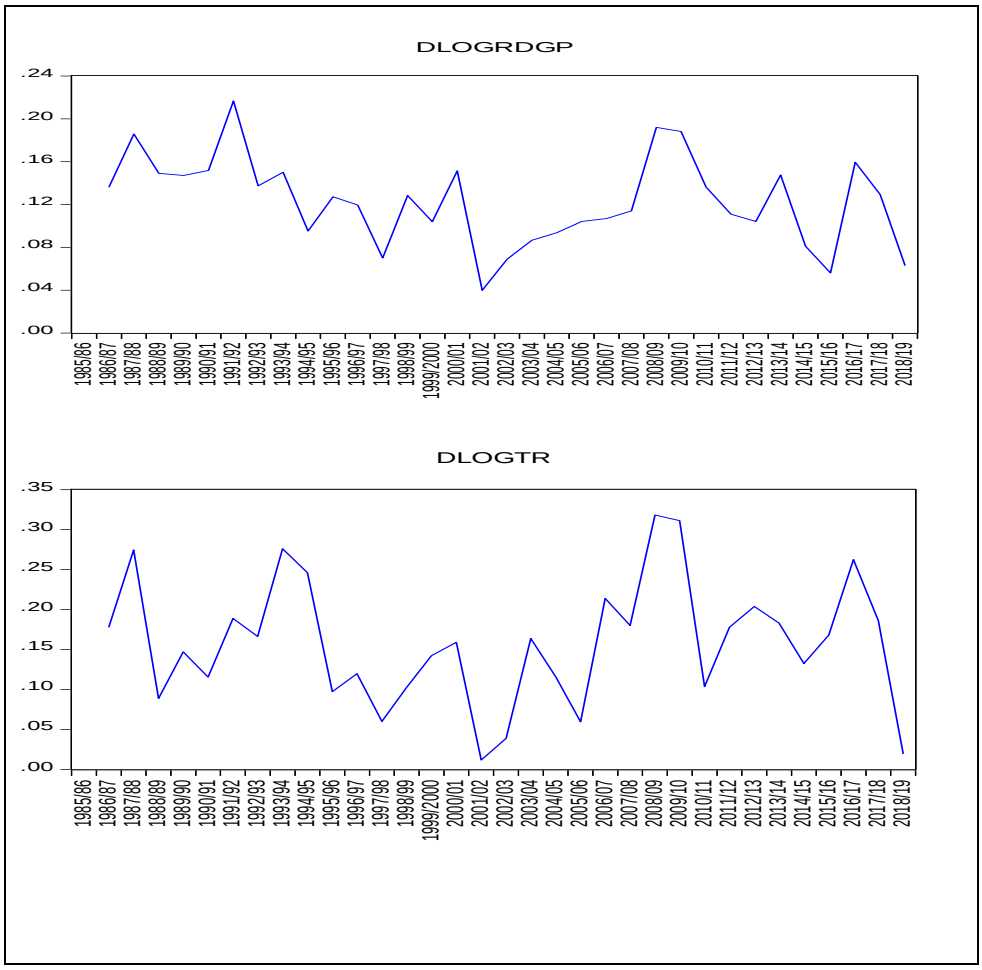
Variable	Level		First Difference		Order of Integration
	Intercept	Intercept & Trend	Intercept	Intercept & Trend	
LOGTR	- 0.116317 [0.9392]	1.960059 [0.5986]	-3.916252 [0.0052]	-3.823186 [0.0282]	I(1)
LOGGDPG	-2.052944 [0.2641]	-2.238987 [0.4537]	-3.795299 [0.0070]	-4.102586 [0.0149]	I(1)

Source: Researcher's calculation from E-views

The E-views software automatically selected the lags of eight and thus each value have been derived. The p-value is taken into consideration to examine whether the variables have unit root or not. The p-value less than 0.05 is considered to be stationary. The above results show the unit root test using Augmented Dickey-Fuller (ADF) test for the order of integration of each variable.

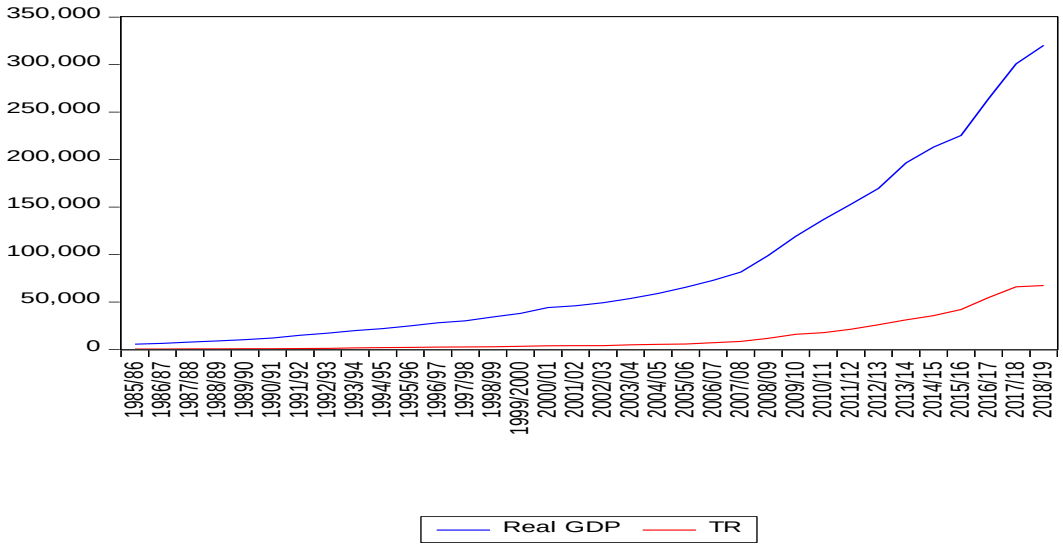
For the level of the series, the null hypothesis of the series having unit roots cannot be rejected at 5% for tax revenue (LOGTR) and Real GDP (LOGRGDP). It shows that LOGTR and LOGRGDP are integrated of order one I(1). The graph of the variables that becomes stationary at the first difference is given in Figure 4.2 .

Figure 4.3 Graphical Representation between D(LOGRGDP) and D(LOGTR).



Source : Researcher's calculation through E-views

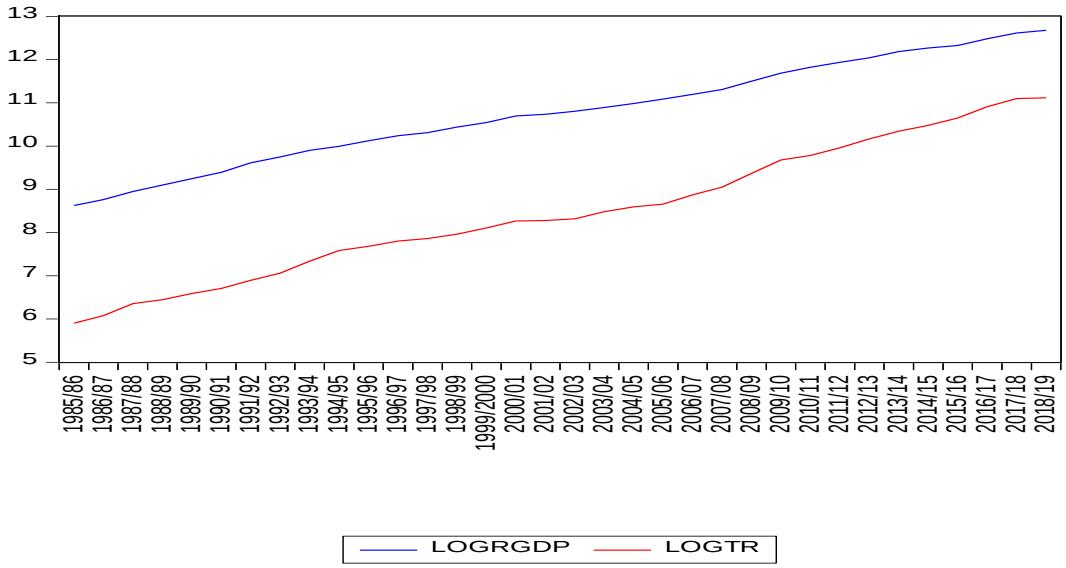
Figure 4.4 Graphical Representation between TR and RGDP



Source : Researcher's calculation through E-views.

Figure 4.5 shows, both RGDP and TR are increasing over the study period. From FY 1985/86 to 2018/19, RGDP is growing at a faster rate while TR is increasing in a slower pace. There are no fluctuations in the data. RGDP started growing much faster from FY 2001/02 till FY 2018/19. Similarly, TR also started growing at a faster rate from FY 2008/09 till 2018/19 with few fluctuations.

Figure 4.5 : Graphical Representation between LOGRGDP and LOGTR.



Source : Researcher's calculation through E-views.

Figure 4.5 shows that there is a strong relationship between LOGRGDP and LOGTR. Both the variables are moving together. At the start of FY 1985/86 the gap between them seems to be higher. But in later years, both LOGRGDP and LOGTR started to grow and the gap between TR and RGDP eventually started to decrease in the later years. The overall trend for both variables can be seen as they are increasing together.

4.4 Autoregressive Distributed Lag (ARDL) model to Cointegration

The test is done to examine the existence of long-run equilibrium among the variables using the ARDL model. The ARDL approach tests the null hypothesis that there is no long-run relationship between the variables. It is done by the bound testing approach. It uses the F-statistics to identify whether the variables used have long-run correlation or not. The maximum number of lag is selected automatically by the software using Akaike Information Criterion (AIC). From twenty different models generated by Eviews, ARDL (1,4) has been selected which is given in APPENDIX B.

Table 4.3 : Result of Bound Test for ARDL (1,4) Cointegration Model

F-Bound Test			Null Hypothesis: No levels relationship	
Test Statistic	Value	Significance	I(0)	I(1)
F-statistic	16.68869	10%	3.223	3.757
		5%	3.957	4.53
		1%	5.763	6.48

Source: Researcher's own calculation through E-views.

The result from the bound test with a maximum lag length (based on Akaike Information criterion), generated from the ARDL model (1,4) indicates that the dependent variable and independent variable are regressed with one lag and four lags respectively. The computed value of F-statistic for the model is 16.68869 which is greater than the upper bound values of 3.757, 4.53 and 6.48 at 10, 5, and 1 percentages significance level respectively. This shows that the rejection of the null hypothesis of the hypothesis given in equation (iv). Thus, the F statistic confirms that there is a long run relationship among variables. The details of the ARDL model is given in Table 4.4.

Table No : 4.4 Coefficient of Long Run Relationship in ARDL (1,4) cointegration form

Dependent variable (LOGRGDP)				
Regressors	Coefficient	Standard Error	t-ratio	p-value
LOGRGDP	0.384497	0.182490	2.106948	0.0468
LOGTR	0.193032	0.078462	2.460198	0.0222
C	0.24560	0.024616	0.997738	0.03293
R-Squared	0.616778	Adj. R-Squared	0.512262	

Source: Researcher's own calculation through Eviews.

Table 4.4 shows that LOGTR has a positive and significant relationship with LOGRGDP at a 5 percentage level of significance. The relationship of LOGRGDP and LOGTR implies that a 1 percent increase in LOGTR causes a 0.192032 percentage increase in LOGRGDP. This has rationality because an increase in TR contributes to the government revenue. Thus collected revenue which is spent on economic activities further increases the income of the public. Thus, an increase in tax revenue increases the economic growth of the country. The R-squared and adjusted R-squared shows that there is the overall significance of the model. This implies that 61.67 percent of the variation in LOGRGDP can be explained by LOGTR. The Table 4.5 is based on the following equation:

DLOGRGDP=0.38449674227*DLOGRGDP(-1)+0.349856401022*DLOGTR-
0.12511978776*DLOGTR(-1)+0.106391945043*DLOGTR(-2)-
0.218756114317*DLOGTR(-3)+0.193031709737*DLOGTR(-4) + 0.0245603680945

4.5 Error Correction of ARDL model

In order to check the long-run relationship between the LOGRGDP and LOGTR, the ECM model is used by taking into account the sign of the adjustment coefficient. The negative sign of adjustment coefficient indicates the existence of long-term relationship between the variables. The error correction form of the calculated equation is given by,

Table 4.5 Estimation of short run coefficient in ARDL (1,4)

Dependent Variable is LOGRGDP				
Variable	Coefficient	Std. Error	t-statistic	Prob.
D(LOGTR)	0.349856	0.064573	5.418002	0.0000
D(LOGTR(-1))	-0.080668	0.074710	-1.079736	0.2920
D(LOGTR(-2))	0.025724	0.072961	0.352579	0.7278
D(LOGTR(-3))	-0.193032	0.066876	-2.886414	0.0086
CoinEq(-1)	-0.415503	0.168557	-3.651602	0.0014
R-Squared = 72.99%			Adj. R-Squared =68.49%	
Durbin-Watson statistics= 1.708262			AIC = -4.160333	

Source: Researcher's own calculation through E views

The above table 4.5 shows the result for short term error correction model for LOGRGDP. The coefficient of the error correction term is negative and statistically significant, indicating the evidence of cointegration between the LOGTR and LOGRGDP. The comparatively higher value of the error correction term for LOGRGDP implies a relatively higher rate of adjustment in LOGTR when shocks arise. The coefficient of error correction term (i.e.; -0.415503) implies that about 41.55 percent of total adjustment takes annually when shock arises. The R-squared is 72.99 percent which implies that 72.99 percent of variation on LOGRGDP is explained by LOGTR.

4.6 Residual Diagnostic test

Heteroscedasticity, Autocorrelation and Normality tests have been conducted.

4.6.1 Serial Correlation/ Autocorrelation

Autocorrelation means that there is a correlation between two random disturbance terms or residuals. It refers to the degree of correlation between the values of the same variables across different observations. If autocorrelations are present in a regression

model, it is considered to be unbiased, inconsistent, and inefficient. Breusch-Godfrey Serial Correlation LM test is done to detect the presence of autocorrelation.

Test for Serial Correlation

To test for Auto correction, Breusch-Godfrey Serial Correlation LM test has been used by done by setting following null and alternative hypothesis.

Null hypothesis (H_0): There is no serial correlation.

Alternative hypothesis (H_1): There is serial correlation.

Table 4.6 Breusch-Godfrey Serial Correlation LM Test

F-statistics	0.116121	F(2,20)	0.8910
Observed R-Squared	0.332884	Prob. Chi Square	0.8467

Source: Researcher's own calculation through Eviews

The table 4.6 shows the result of the serial correlation test. The corresponding probability value for F-statistic and observed R-Squared with a degree of freedom 2 is 0.8910 and 0.8467 respectively which is greater than 0.05. It means that the null hypothesis cannot be rejected rather it is accepted. Hence, it is concluded that there is no serial correlation.

4.6.2 Heteroskedasticity

Heteroskedasticity is a systematic change in the spread of the residuals. In Homoscedasticity, the value of residual value doesn't increase with the increasing value of the independent variables. To test for Heteroskedasticity, the Breusch-Pagan test will be done.

Test for Heteroskedasticity

To test the heteroskedasticity, Breusch- Pagan test has been used by setting following null hypothesis and alternative hypothesis.

Null hypothesis (H_0): Residuals are not heteroskedastic.

Alternative hypothesis (H_1): Residuals are heteroskedastic.

Thus the following table is obtained and extracted from E-views

Table 4.7 Breusch- Pagan test for Heteroskedasticity

F-statistic	0.583882	**Prob.(6,22)**	0.7318
Observed R-Square	4.042927	**Prob. Chi Square(2)**	0.6709
Scaled explained SS	2.194015	**Prob. Chi Square**	0.9010

Source: Researcher's own calculation

The table 4.7 shows the result of heteroskedasticity test. The corresponding probability values for the observed R-squared are 0.6709 which 6.70 percent and more than 5 percent. It means that the null hypothesis can not be rejected rather it is accepted. Hence it is concluded that the model is free from heteroskedasticity.

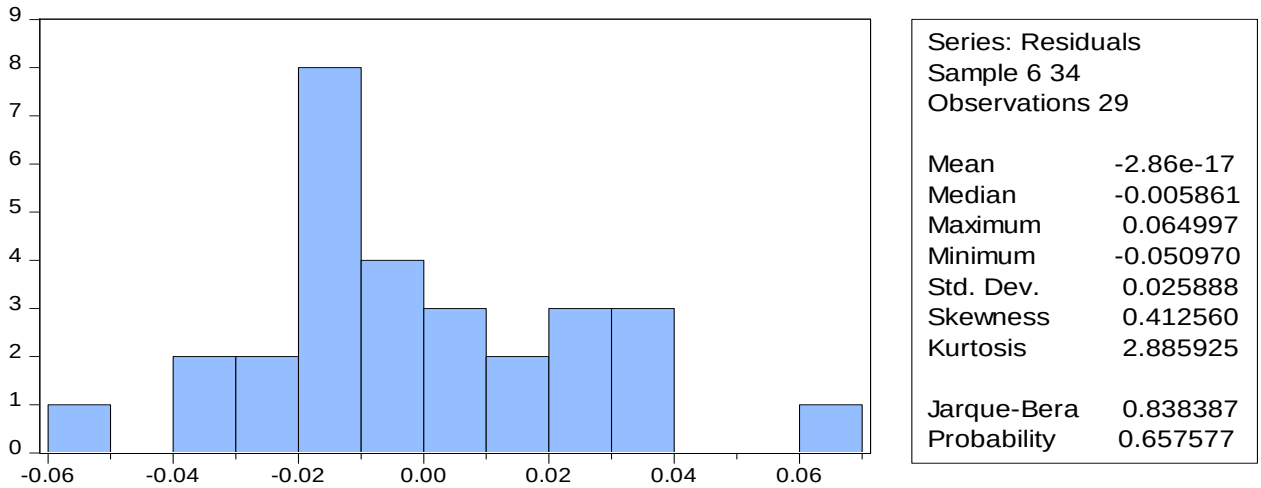
4.6.3 Normality Tests

To test the normality of residuals, Jarque-Bera test has been used by setting following null hypothesis.

Null hypothesis (H_0): Residuals are normally distributed.

Alternative hypothesis (H_1): Residuals are not normally distributed.

Figure : 4.6 Normality Tests



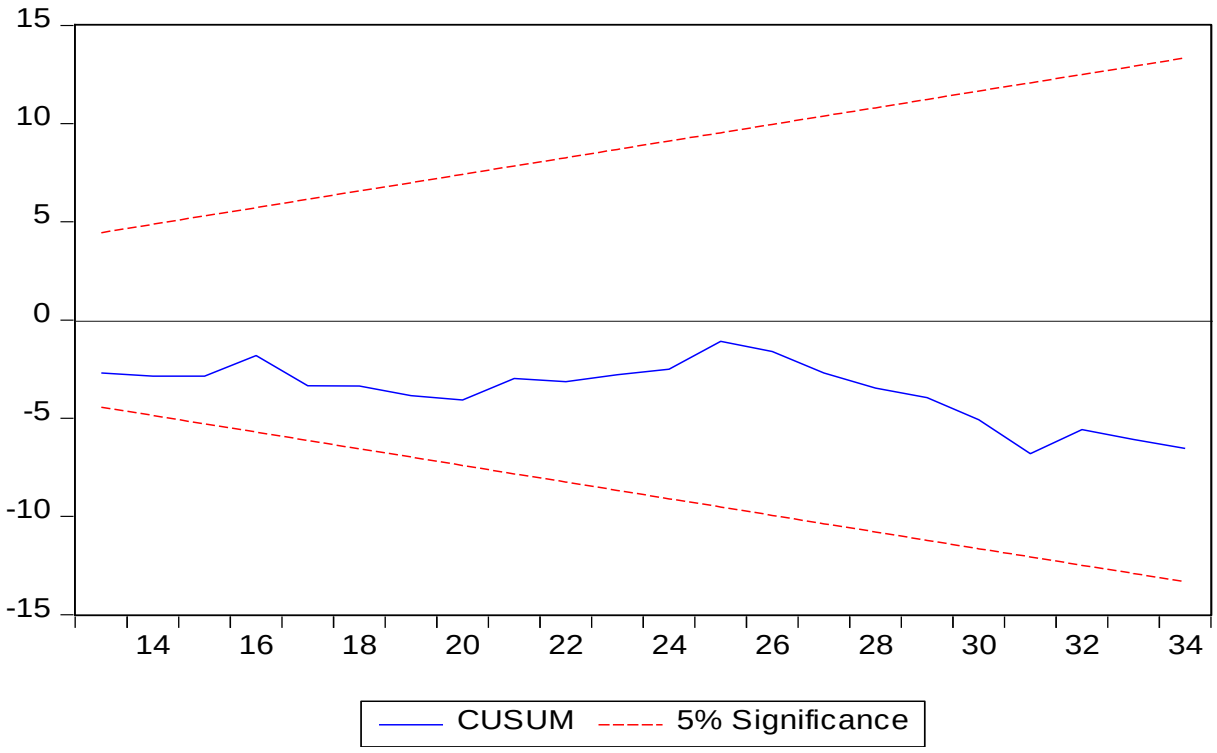
The figure shows the result of Jarque-Bera (JB). The JB value is 0.838387 with P-value 0.6575. Since P-value is more than 5 percent level of significant, the null hypothesis can not be rejected. It means the residuals are normally distributed.

4.6.4 CUSUM and CUSUMSQ test

The stability of the long-run parameters together with short-run movements for the estimated equations should be examined. For this, the thesis relied on the cumulative sum of recursive residuals (CUSUM) and cumulative sum of squares of recursive residuals (CUSUMSQ) tests proposed by Borensztein et al. (1998). The CUSUM test is based on a plot of the sum of the recursive residuals. If this sum goes outside a critical bound, one concludes that there is a structural break at the point at which the sum begins its movement toward the bound. The CUSUM-OF-SQUARES test is similar to the CUSUM test, but plots the cumulative sum of squared recursive residuals, expressed as a fraction of these squared residuals summed overall observations.

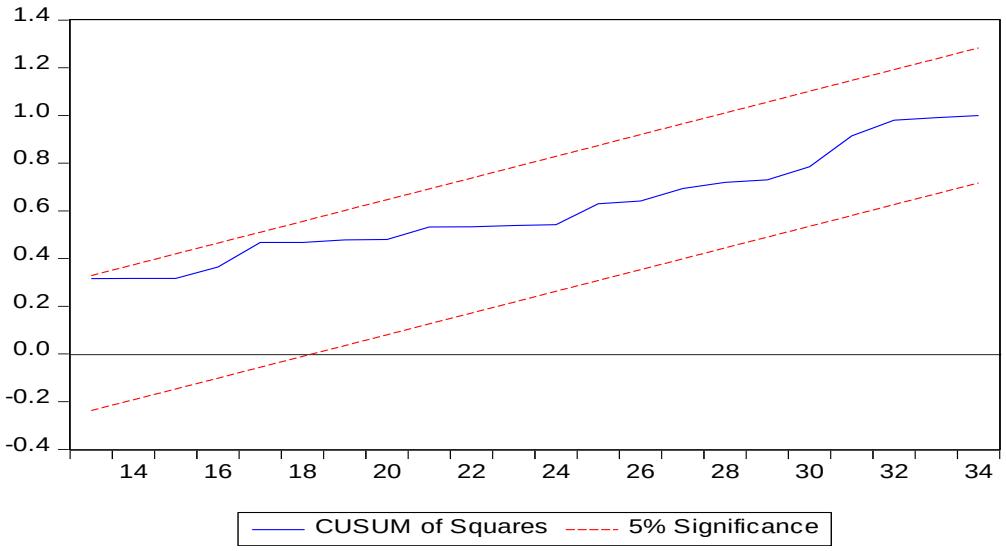
The CUSUM and CUSUMSQ plotted line should be within the border. The model is considered to be unstable if the plotted line crosses the borderline at the 5 percent level of significance.

Figure 4.7 Cumulative sum of Recursive Residuals (LOGRGDP)



Source: Reseacher's own calculation through Eview

Figure 4.8 Cumulative Sum of Squares of Recursive Residuals LOGRGDP



Source: Researcher's own calculation through Eviews

Since, the plots of CUSUM and CUSUMSQ statistic for LOGRGDP is within the critical lines at 5% level of significance, we can conclude that long-run coefficient of LOGRGDP function is stable.

CHAPTER V

SUMMARY, CONCLUSION AND RECOMMENDATIONS

The chapter consists of a summary, conclusions, and recommendations. The conclusion of this study is abstracted from the trend tax revenue and the relationship between tax revenue & economic growth based on the results.

5.1 Summary

Economic growth is taken as an increase in the productive capacity of the country which is measured annually. Meanwhile, taxes are a part of a country's income collected by the government for which there is no reciprocal benefit provided to taxpayers. In a country like Nepal, a insufficient financial resource is a major constraint for economic development. Taxation is considered as a convenient method of raising revenue which in turn is linked with the welfare of the people and economic growth. Tax revenue is a very important instrument for the government to meet the planned expenditures and helps to achieve set growth targets over the years. Numerous studies have revealed the relationship between tax revenue and economic growth. The previous empirical studies found different and disaggregated results. With the dissimilar findings in the previous studies and for the fact that very little researches have been done in Nepalese context, there needed a further investigation of the short-run as well as long-run relationships between tax revenue and economic growth in Nepal. So, this study tried to explore the short run and long run relationship between tax revenue and economic growth covering the time periods of 1985 to 2019.

The objectives of study were to examine the trend of tax revenue and explore the relationship between tax revenue and economic growth. To achieve the targeted objectives of the study, secondary data have been used. The nature of the study is descriptive as well as analytical. Under quantitative analysis, the research is conducted to analyze the relationship between tax revenue and economic growth using the ARDL model. And under qualitative, the trend of tax revenue is analyzed using a graph. The main sources of data for this study are abstracted from, Economic Survey and Indicators from Nepal Rastra Bank and Ministry of Finance (MoF).

It is essential to carry out stationarirty test of the data while carrying out any analysis, thus, the Augmented Dickey Fuller (ADF) test of unit root test has been used in the study. Once the variable's individual stationarity is checked, ARDL model of cointegration is used. To examine the trend of tax revenue, descriptive analysis have been done. And, the study showed the relationship of tax revenue to the real GDP through ARDL bound testing approach. Also, Heteroskedasticity, LM Correlation test, and Normality tests, CUSUM & CUSUMQ tests are carried out through E-views software.

5.2 Conclusion

Based on the study following conclusions are drawn:

1. The trend of tax revenue is increasing in nature.
2. Tax revenue has a positive and significant relationship with economic growth at a 5 percent level of significance.
3. The relationship of economic growth and tax revenue implies that a 1 percent increase in tax revenue causes a 0.192032 percent increase in economic growth. This has rationality because increase in revenue contributes in economic activities which further increases the income of the public. Thus, an increase in tax revenue increases the economic growth of the country. The R-squared and adjusted R-squared shows that there is overall significance of the model. This implies that 61.67 percent of the variation in economic growth (measured by Real Gross Domestic Product) can be explained by tax revenue.

5.3 Recommendations

1. As this study has explored that there exists a positive relationship between tax revenue and economic growth, it is recommended to government and policymakers to consider the increment of tax revenue to attain certain economic growth.
2. Increasing direct tax such as income tax rate might not be the proper solution to increase tax revenue. Rather,the government should focus on increasing other indirect taxes to lower the direct burden of the taxpayers.
3. The formulation of the five years strategic plan by Inland Revenue Department had adhered to four strategic objectives, which are a) policy

reform and enhancement of enforcement b) improving taxpayer service and education, c) opitmal use of information technology, and d) revitalization of Inland Revenue Department's organization structure and mobilization of compenent human resources. According to the new plan, all the businesses and individuals are required to obtain a permanent account number (PAN) from the Inland Revenenue administration. This plan has contributed in less tax evasion in recent years and increased tax revenue. Also, the plan focused on optimal uses of modern technology which has made easier for tax payers to pay their taxes through online system. There are very minimal number of people who are aware of online payment system. It is recommended that people should be made aware about usage of online payment system.

4. For future researchers, it is recommended to consider various factors that affect the economic growth of Nepal as this study only considered tax revenue to find out the relationship between tax revenue and economic growth.

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APPENDIX A : COMPOSITION OF TAX REVENUE

(**Nrs. in Millions)**

FY	Tax	Customs	Excise	Income	Sales/VAT	Other tax
1985/86	3659.3	1231	558.7	364.4	1173	332.2
1986/87	4371.7	1505.1	678.6	437.5	1363	387.5
1987/88	5752.8	2214.6	825.3	579	1612.5	521.4
1988/89	6287.2	2289.9	877.7	861.1	1698.9	559.6
1989/90	7283.9	2684.9	1097	919	1953.8	629.2
1990/91	8176.3	3044.3	1200.2	746	2354.4	831.4
1991/92	9875.6	3358.9	1414.3	855.5	3283.6	963.3
1992/93	11662.5	3945	1452.8	1124.8	4007.7	1132.2
1993/94	15371.5	5255	1592.5	1824.5	5380.9	1318.6
1994/95	19660	7018.1	1657.3	2711.8	6857.1	1415.7
1995/96	21668	7327.4	1944.3	3311.6	7429.3	1655.4
1996/97	24424.3	8309.1	2298.1	3969	8162.9	1685.2
1997/98	25939.8	8502.2	2885.8	4685.9	8020.6	1845.3
1998/99	28752.9	9517.7	2953.2	5850.7	8765.9	1665.4
1999/00	33152.1	10813.3	3127.6	7006.2	10259.7	1945.3
2000/01	38865	12552.1	3771.2	8650.1	12382.4	1509.2
2000/01	38865	12552.1	3771.2	8650.1	12382.4	1509.2
2001/02	39330.6	12650	3807	8436	12267.3	2170.3
2002/03	40896	12783.2	3771.2	8811.8	13459.7	2070.1
2003/04	48173	15554.8	6226.7	8512.5	14478.9	3400.1
2004/05	54104.7	15701.6	6445.9	9402.4	18885.4	3669.4
2005/06	57430.4	15344	6507.6	9598.8	21610.7	4369.3
2006/07	71126.7	16707.6	9343.2	13979.1	26095.6	5001.2
2007/08	85155.5	21062.4	11189.6	16223.3	29815.7	6864.5
2008/09	117051.9	26792.9	16220.9	23457.3	39700.9	10879.9
2009/10	159785.3	35218.9	24147.6	33821.3	54920.9	11676.6
2010/11	177227.2	35713.5	26338.5	41350.3	61663.6	12161.3
2011/12	211721.8	43390.6	30016.1	51303	70930.4	16081.7
2012/13	259610	56890	36660	67020	83510	15530
2013/14	311800	67880	45390	77920	100960	19650
2014/15	355942.9	74671	53525	88459.1	112377.4	26910.4
2015/16	421096.6	82159.1	65776.4	117407.8	122411.9	33341.4
2016/17	547486.4	113184	84678.4	148236.1	160316.6	41071.3
2017/18	659491.3	137785.3	102579.1	159900.5	206793.9	52432.6
2018/19	738565.4	162654.3	112383.2	171932.2	232938.2	58657.5

Source : Economic Survey, FY 2016/17 and various years' budget.

APPENDIX B : ARDL MODEL SELECTION CRITERIA

Sample: 1 34

Included observations: 29

Model	LogL	AIC*	BIC	HQ	Adj. R-sq	Specification
16	65.324825	-4.022402	-3.692365	-3.919038	0.512262	ARDL(1, 4)
11	65.325716	-3.953498	-3.576313	-3.835368	0.489068	ARDL(2, 4)
20	59.864650	-3.921700	-3.780256	-3.877401	0.398584	ARDL(1, 0)
6	65.343670	-3.885770	-3.461437	-3.752874	0.464185	ARDL(3, 4)
15	60.019733	-3.863430	-3.674837	-3.804365	0.381181	ARDL(2, 0)
19	59.872771	-3.853295	-3.664702	-3.794230	0.374877	ARDL(1, 1)
17	61.800776	-3.848329	-3.565441	-3.759732	0.405117	ARDL(1, 3)
1	65.354242	-3.817534	-3.346053	-3.669872	0.436396	ARDL(4, 4)
10	60.152916	-3.803649	-3.567909	-3.729818	0.361290	ARDL(3, 0)
14	60.029027	-3.795105	-3.559365	-3.721274	0.355810	ARDL(2, 1)
18	60.022699	-3.794669	-3.558928	-3.720838	0.355529	ARDL(1, 2)
12	61.992433	-3.792582	-3.462545	-3.689218	0.386244	ARDL(2, 3)
5	60.862317	-3.783608	-3.500719	-3.695011	0.365343	ARDL(4, 0)
2	63.290047	-3.744141	-3.319808	-3.611245	0.382661	ARDL(4, 3)
7	62.199742	-3.737913	-3.360728	-3.619784	0.366145	ARDL(3, 3)
9	60.186421	-3.736995	-3.454106	-3.648397	0.335059	ARDL(3, 1)
13	60.071952	-3.729100	-3.446211	-3.640503	0.329789	ARDL(2, 2)
4	61.048655	-3.727493	-3.397457	-3.624130	0.344967	ARDL(4, 1)
8	60.225495	-3.670724	-3.340687	-3.567360	0.306705	ARDL(3, 2)
3	61.189139	-3.668217	-3.291031	-3.550087	0.320391	ARDL(4, 2)