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Influence of Different Economic Sectors on Gross Domestic Product (GDP) of Nepal

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Abstract:

This paper analyzed the effect of fluctuation of agricultural, industrial and service sector of economy on the GDP growth of Nepal. Secondary data used for this study was collected from the Central Bureau of Statistic of Nepal from year 2001/02 to year 2013/14. Multiple Regression Analysis and Pearson's Correlation Coefficients were used to analyze the data. The study identified the bottlenecks in GDP growth and suggests some procedures to eliminate them and some areas that can contribute more to GDP of Nepal were also suggested. Analysis shows service sector as major contributor to GDP of Nepal followed by agricultural and industrial sector respectively. The study also reveals slow shifting of economic sector from agriculture to industry and industrial to service which result in negligible growth in GDP even after a long time period. On the ground of labor involvement, agriculture is the largest economic sector serving 71% people, but contributing only 33.9% to GDP. The study also exhibits that GDP has a strong positive relationship with service and agriculture sector and negligible relationship with industrial sector. Even though, agricultural sector plays a vital role on the basis of people involvement, this study suggests economist to concentrate their attention on key areas of all economic sectors which can contribute more on GDP growth.

Keywords: GDP, economic sector, development process, regression analysis

1. Introduction

Nepal is a small agrarian land-locked country having total land area of 147,181 Sq. Km. Even though it is small on the ground of land mass, it possesses immense ethnic, climatic, cultural and biological diversities. After acceding to World Trade Center in 2004, Nepal tries to transform its economy away from the predominantly agricultural sector to services and industrial sector though the desired changes have not been accomplished (Government of Nepal, 2012). As agro based industries occupy a considerable share in Nepal's export, agriculture plays a vital role in Nepalese economy.

Nepal is among the poorest and the least developed country suffering from wide spread poverty and deprivation. Agricultural sector covers one third of total economy and more than two third populations derive their livelihood from it. In recent years, remittance from foreign employment has become the major source of foreign currency and foreign employment becomes the largest component of service sector. Industrial sector is relatively small in comparison to other two sectors of economy. If we analyze the trend of GDP then it reveals that GDP of Nepal has been growing slowly. GDP of Nepal has reached to \$19.1 billion in FY 2012/13 from \$ 6 billion of FY 2000/01. According to the Economist Intelligence Unit HDI score of Nepal was only 0.43 in year 2013 (Institutes for Integrated Development Studies, 2014).

One of the best measurement scales for measuring overall economic performance of the nation and the material well-being of its population is GDP. Economic development of a country and improvements in general welfare of its population will be rapid if GDP growth rate is higher. After the adoption of a liberal macroeconomic policy in late 1990, GDP growth rate of Nepal started to increase and average growth rate from FY 1990/'91 to 1999/2000 was stood at 4.8%. But after 1999/2000, due to Maoist insurgency and nine-eleven incidents, GDP growth rate of Nepal started to decline continuously. In fact, nine-eleven incidents disturb the tourism sector and international trade of Nepal (Sharma & Khadka, 2011). On the other hand, during the period of Maoist insurgency, lot of infrastructure was destroyed, lot of factories and industrial estates were closed, lot of people migrated to city areas in search of security by leaving their land barren in the rural areas and the like. This migration of rural people resulted in low agricultural production and became the main reason for the GDP reduction in Nepal. Uncertain rainfall, lack of irrigation facilities, lack of seeds, fertilizer and pesticides, lack of modern agricultural tools and lack of agriculture related education and training are the major factors influencing the agriculture sector of Nepal. Similarly, non-agricultural sectors of Nepal are hampered by band (closing entire sector of

nation), labor union strikes, political instability, load sheddings, corruption, complex legal procedure, lack of peace and security and so on.

Agriculture and non-agriculture are two major economic sector uses to measure the GDP of a country. Non-agriculture sector can further be categorized into industrial and service sector. In Nepal, the agriculture sector is composed of agriculture, forestry and fishery whereas mining and quarrying; electricity, gas and water; manufacturing and construction are listed under industrial sector. Likewise, service sector comprises of wholesale and retail trade; hotels and restaurants; transport, storage and communication; financial intermediation; real estate, renting and business; public administration and defense; education, health and social work; and other community, social and personal service (Central Bureau of Statistics, 2000). Historical analysis of economic development of several nations demonstrate that economy of any nation shifts from agriculture to industry and ultimately to service during the process of economic development. Statistics presented by Central Bureau of statistic of Nepal shows that 71% people are involved in the agriculture sector, which contribute only 33.9% to GDP of Nepal. It demonstrates that three-fourth of population of Nepal produces only one-third of GDP. This low level of productivity can be taken as evidence of existence of high levels of poverty inside the agriculture sector. This high level of poverty further results in income inequality in the country. If we look at the trend of past 13 years, it reveals that the contribution of the agriculture sector to GDP was 37.89% in FY 2001/02 which declined by 3.75% and reached 34.14% in FY 2013/2014. Comparatively, there is no significant difference between present agriculture related statistic and statistics before 13 years and this negligible fluctuation in the agriculture can be interpreted as a declined in the modernization of the economy. Likewise, if we talk about the non-agriculture sector of the economy, then it is found that the combined contribution of industrial and service sector of economy to GDP of Nepal is 65.86% in FY 2013/2014. 14.83% out of 65.86% is of industrial sector, which was 17.05% in FY 2001/02 and rest 51.03% is of the service sector which was 45.06% in year 2001/02. Trend and size of statistical fluctuation in different sector of Nepalese economy clearly demonstrates slow modernization and economic development process of Nepal. Replacement of agriculture and industrial sector by service sector is not as much as expected by the national plan. Manufacturing is the largest sub-sector contributing about 44.42% in the total industrial sector in FY 2013/14 followed by construction (37.86%), electricity, gas and water (14.94%) and mining and quarrying (2.87%) respectively (Nepal Rastra Bank, 2014). In Nepalese economy, most flourishing sector is service sector and its contribution to GDP is more than three times than that of industrial sector and nearly around double of the agricultural sector. Not only contribution of service sector to GDP but also its growth rate is much higher in comparison to agricultural and industrial sector. Wholesale and retail trade is the largest contributor (25.81%) of service sector followed by transport, storage and communication (20.19%), real estate, renting and business (14.98%), education (13.27%) respectively. Rest sub-sectors (such as hotels and restaurant, financial intermediation, public, administration and defense, health and social work and other community, social and personal service) have less than 10% contribution to the service sector of economy.

Whatever the economic situation of a country i.e. whether developed, developing or under developed it is very essential for economist and national planner to know the impact of the fluctuation of economic sector to GDP, so that they can take corrective actions and measures the level of modernization and economic development of the nation.

This study is conducted to measure the influence of three major economic contributor i.e. agricultural, industrial and service sector on GDP growth of Nepal. In economics, agricultural, industrial and service sectors are also known as primary, secondary and tertiary sector of economy respectively. Contribution of primary, secondary and tertiary sector of the economy to GDP of Nepal is 34.14%, 14.83% and 51.03% respectively in FY 2013/14 (Central Bureau of Statistic, 2014).

All the three sectors of economy has their own role and equally important in the development of any nation. Proper composition of these three sectors in GDP is required to sustain growth, to generate employment and incomes and to reduce poverty. In fact, the proportion of these three sectors in GDP determines the situation of socioeconomic development of any country. Out of various economic sectors, the Nepalese economy considers primary, secondary and tertiary sectors as prime contributor to the GDP and rest two sectors namely quaternary and quinary sectors have not been included in GDP calculation.

2. Hypotheses

On the basis of objectives of the study, following hypotheses have been set.

1. H_0 : GDP of Nepal is not significantly influenced by fluctuation in agriculture, industrial and service sector of economy.
 - H_1 : GDP of Nepal is significantly influenced by fluctuation in agriculture, industrial and service sector of economy.
2. H_0 : Agriculture, industrial and service sectors of economy are not interrelated to each other.
 - H_1 : Agriculture, industrial and service sectors of economy are interrelated to each other.

3. Objective of the Study

Major objective of this study is to determine the effect of fluctuation of agricultural, industrial and service sector of economy on annual growth of GDP of Nepal. Some sub objectives of this study are:

1. To measure the magnitude and direction of long-run relationship between GDP and agriculture, industry and service sector of economy.
2. To determine the interrelationship among agriculture, industrial and service sector of economy.

4. Significance of the Study

This study will be fruitful because of the following reasons:

1. Outcome of this study will support policy makers to take some necessary steps which will be supportive for the sector wise development of the national economy of Nepal.
2. This study will add some extra literature in the field of economics.
3. This study will act as foundation for potential researchers to conduct research in agricultural, industrial and service sector of Nepalese economy.
4. This study will support donor agencies and foreign investors to identify the suitable and lucrative sector of economy and to know where to support and where to invest.

Besides aforementioned importance, data and result of this study will be helpful for students, entrepreneurs and economist and they can use it for different sorts of economic analysis.

5. Literature Review

As per traditional macroeconomics GDP can be categorized into three major sectors and are agricultural, industrial and service sector. Out of these three sectors, the agriculture sector have been considered as an important sector in developing country as it supports in sustainable growth and poverty reduction. According to past research (Datta & Ravallion 1998; Timer 1979 and Thirtle 2001) if the ownership of land is not highly skewed then agricultural growth is more effective in rural poverty reduction in comparison to industrial growth. In developing countries, proportion of agricultural sector is higher in GDP, employment and incomes. Hence, it is very essential for government of developing nation to pay more attention on the growth of the agricultural sector to bring smoothness and to impart continuity in socioeconomic development process.

Several past studies (Douglas & Clark, 1941; Kuznets, 1957; and Fuchs, 1980) reveal that size of people involving in different sector of economy will change from one year to another year as they shift from one sector of economy to another during the course of development. In the process of economic development certain percentage of people shifts from the agricultural sector to industrial sector and again from industrial to service sector. Within 1970-80, 123 countries increase their per capita GDP by shifting their economy from agricultural and industrial sector to service sector (Kongsamut, Rebelo & Xie, 2001). According to Rath et.al. (2006), higher economic growth rate in India is the result of higher growth in service sector. But in the context of Nepal 71% labor force is involving in the agricultural sector for their livelihood whereas this ratio in industrial and service sector is only 12% and 17%, respectively (United Nation, 2013). United Nation (2013) analyzed the key indicators of labor market (KILM) of ILO and estimated the labor force ratio for year 2018 and it will be 69%, 13% and 19% in agriculture, industrial and service sector respectively. This estimation shows that very small size of population will be shifted from primary sector of economy to secondary sector and tertiary sector of economy which result in negligible changes in GDP of Nepal even after five years from now.

6. Research Methodology

Data for this study has been collected from secondary source known as Central Bureau of Statistics Nepal consecutively from year 2001/02 to year 2013/14. Four variables are included in this study and are agriculture, industry, service and GDP growth of Nepal. In this study agriculture, industry and the service sector are independent variables and GDP is dependent variable. To analyze the influence of fluctuation of agriculture, industry and service sector in GDP; multiple regression model is used. This paper also traces the magnitude and strength of the long run relationship between predictor variable and criterion variables.

Explained variable (GDP) measures the size of the economy, i.e., how big or small an economy is. Nominal GDP is expressed in current price (in Rs.) whereas production approach expresses GDP as the total value of final goods and services produced by all production units in a country within a certain time period i.e. usually in one year time period. Agriculture, a predictor variable, indicates the primary sector of the economy and it includes the production of cultivatable food products along with crop and livestock production, fishing, forestry and hunting. In fact, agriculture output is defined as the first transformation of natural resources. Likewise, industry indicates the secondary sector of the economy and it includes the value added in manufacturing, construction, mining, water, electricity, gas and the like. Industrial sectors are those sectors of the economy, which process primary goods into more elaborate products for market use. Lastly, service sector indicates the tertiary sector of the economy and it includes value added in wholesale and retail trade; hotels and restaurants; transportation, storage and communication; financial intermediation; real estate, renting and business; public administration and defense; education and other community, social and personal services. Service sector can be defined as production of services which can be consumed directly without storing and transforming into other goods.

In this study dependent variable GDP is discrete variable and to examine the relationship between a dependent variable and a set of independent variable, multiple regression analysis is employed.

General form of the multiple regression equation is as under:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \dots + \beta_n X_n + e \dots \dots \dots (I)$$

Where Y is dependent variable, β_0 is intercept, $\beta_1, \beta_2, \beta_3$ and β_n are slope of respective independent variables and X_1, X_2, X_3 and X_n are independent variables and e is unpredicted random variable.

On the ground of the above regression equation, this study developed the following model equation for research purpose.

$$Y = \beta_0 + \beta_1 \text{Agriculture} + \beta_2 \text{Industry} + \beta_3 \text{Service} + e \dots \dots \dots (II)$$

$$G = \beta_0 + \beta_1 A + \beta_2 I + \beta_3 S + e \dots \dots \dots (III)$$

Only four economic variables, i.e. GDP, Agriculture, Industry and Service are considered for analysis because of availability of relevant information on them. Even though other economic indicators such as labor and capital have also some impact on GDP, they are not considered here as an independent variable because of lack of information on them. In our model equation G represents GDP, A represents agriculture sector, I represents industrial sector and S represents service sector of economy, β_0 is intercept or constant, β_1 , β_2 and β_3 are the estimated regression coefficient or slope. In this study IBM SPSS software is used to analyze the data. Along with regression analysis Pearson's Correlation Coefficients are determined to measure the magnitude and strength of relationship among the independent variables.

7. Data Analysis and Presentation

GDP growth rate at constant price and growth rate of primary, secondary and tertiary sector of Nepal for 13 years i.e. from FY 2001/02 to FY 2013/14 has been presented below in Table 1.

Year	GDP Growth Rate	Agricultural Growth Rate	Industrial Growth Rate	Service Sector Growth Rate
2001/02	0.16	3.15	0.66	-1.78
2002/03	3.8	3.3	3.1	3.7
2003/04	4.4	4.7	1.5	6.8
2004/05	3.2	3.5	2.9	3.3
2005/06	3.73	1.86	4.37	5.63
2006/07	2.75	0.98	4.02	4.51
2007/08	5.8	5.82	1.64	7.35
2008/09	3.90	2.99	-0.63	6
2009/10	4.26	2.01	4.05	5.83
2010/11	3.85	4.48	4.4	3.42
2011/12	4.48	4.98	2.96	4.51
2012/13	3.56	1.31	1.49	6.03
2013/14	5.2	4.7	2.7	6.1

Table 1: Fluctuations in GDP and Major Economic Sectors (In Percentage)
Source: Central Bureau of Statistic, Nepal

It is revealed from the Table 1 that service sector is the largest contributor to GDP of Nepal continuously from FY 2001/02 to FY 2013/14 except in year 2001/02 and 2004/05 and it is followed by agricultural and industrial sector respectively. Even though proportion of contribution is different in different year, trend of contribution is more or less same with in these 13 years. As per the objectives and requirement of this research multiple regression analysis has performed among these four variables and result of analysis is presented below along with interpretation.

Variable	Unstandardized		t-Statistic	Sig.
	Coefficient	Std. Error		
Constant	-0.001	0.003	-0.437	0.673
Agriculture	0.375	0.064	5.828	0.000
Industry	0.168	0.063	2.671	0.026
Service	0.473	0.041	11.488	0.000
R Square	0.955	F-Statistic		63.567
R	0.977	Sig. (F-Statistic)		0.000
Adj. R Square	0.940	Sum of Square Residuals		0.000
Standard Error of Estimate	0.0033020			

Table 2: Result of Regression Analysis

A value of Pearson's Correlation Coefficient 'R' in the above table is 0.977 and it lies above 0.70 which indicates very strong positive relationship between GDP and agriculture, industrial and service sector of Nepalese economy. Likewise, Coefficient of Determination 'R²' is 0.955 and it explains 95.5% variance in GDP is caused by fluctuation in agriculture, industrial and service sector of economy. Also $F(3,9) = 63.567$, $P < 0.05$ shows agriculture, industrial and service sector are statistically significant to predict the GDP of Nepal. As p -value of all agriculture, industrial and service sectors of economy is less than 0.05, they are individually statistically significant to predict the value of GDP at 95% confidence level. From the above data we can form the following multiple regression equation to predict GDP from three major explanatory variables.

$$GDP = -0.001 + 0.375 A + 0.168 I + 0.473 S$$

GDP of Nepal will be increased by 0.375% if agriculture sector increased by 1%, holding other variable constant. Likewise 1% growth in industrial sector causes 0.168% growth in GDP, keeping rest of the variable constant. If we hold agriculture and industrial sector constant then 1% growth in service sector causes 0.473% growth in GDP. If growth rate of all the three sector of economy is zero then GDP growth rate of Nepal will be decreased by 0.001%. 100% growth in agriculture, industrial and service sector of economy can cause only 99.99% growth in GDP and there are some other hidden factors besides agriculture, industrial and service sectors which reduced GDP by 0.001%. Association among these four variables can be understood from the table below.

	GDP	Agriculture	Industry	Service
GDP	1			
Agriculture	0.483983	1		
Industry	0.150803	-0.18518	1	
Service	0.878831	0.117663	0.044367	1

Table 3: Association among the Variables

GDP has very strong and positive relationship with service sector whereas this relationship with industrial sector is negligible and with agriculture sector is strong and positive. Likewise, agriculture sector has negligible relationship with industrial and service sector. Similarly, relationship between industrial sector and service sector is strong and positive.

8. Summary, Conclusion and Recommendation

This research paper focuses on the variables that influence the GDP growth of Nepal. Result of study demonstrates a strong positive relationship between GDP growth rate and fluctuation among agriculture, industrial and service sector of the economy. Analysis shows service sector as one of the major contributor to GDP followed by agriculture and industrial sector respectively. As Nepal is a small land locked country and surrounded by two economic giants i.e., India and China, it is extremely hard for Nepal to achieve a targeted rate of GDP growth in short time. It is very essential for Nepal to modernize its agricultural system and reduce importing agricultural product from outside the nation. Nepal is the richest country in the world in terms of generating electricity through running water. That is why generating more and more electricity and exporting it to neighboring country is one and only option to increase contribution of industrial sector to GDP. As Nepal is mountainous country and one of the best tourist destinations in the world, the tourism industry can be a major service sector that can increase the contribution to GDP of Nepal. Study also reveals that GDP has strong and positive relationship with agriculture and service sector and negligible relationship with the industrial sector.

9. References

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