
An Analysis of Measuring Economic Growth of Nepal

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Abstract

The paper has attempted to analyze measuring of economic growth and the dynamics in the contribution of three major sector such as agricultural, industrial and service sector of Nepal. Mainly, the GDP growth rate is deepening on the various sectors but this study analyzed relationship between Gross Domestic Product (GDP) and three main sectors. The Multiple Regression Analysis and Pearson's Correlation Coefficients statistical tool is used for secondary data available from the Central Bureau of Statistics of Nepal. This study covers time frame for the period of 2001/02 - 2015/16. And the study found that economic growth has positive relation with service sector and agriculture sector. But Industry sector has a negligible contribution to economic growth of Nepal. In this empirical analysis, economic growth parameters; GDP of Nepalese economy is taken in order to oversee into the relationship between sectoral growth rate and economic growth. The major economic contributors have high potentiality of inclusive, broad based and sustainable development of long term economic growth of Nepal. This study suggests all the stakeholders to bust up the national economy empowering the key economic parameters.

Key Words Economic Growth, Gross Domestic Product, Service sector Agriculture Sector and Industry Sector

Background

Economic growth is the increment in the capacity of economy to produce goods and services as per the population over a period of time. It can be measured by Gross Domestic Product (GDP). It is an economic tool which attributes the value of goods and services within the boundary of an economy over a period. GDP shows the level of economic growth accounting the major factors. Nepal has a low level of economic growth. It is a south Asian nation among the poorest and least developed countries in the world. Nepal is heavily dependent on remittances. Agriculture is the backbone of the Nepalese economy generating livelihood for more than 70% of the population and bookkeeping for a modest over one-third of GDP. Industrial sector activity involves the processing of cash crops and food crops. Nepal has substantial capacity for exploiting its prospective in hydropower which is estimated 42,000 MW of commercially viable capacity. Economic growth is low during the last decade and the current year. Three major areas of economy are agriculture sector, industry sector and service sector which has greater potentiality to achieve targeted economic growth of Nepal. Likewise, these sectors have been yielding lower productivity however generating employment opportunities. On the other hand, industry sector has low productivity and service sector is operating with a higher productivity.

On the other hand, the policy implementations of concern sectors have not been effective due to political uncertainty and a complicated business climate has hindered foreign investment. A supplementary challenge to Nepal's growth includes its landlocked geographic position, unrelenting power shortages, unripe transportation infrastructure, civil contention and labor turmoil, and its vulnerability to natural disaster. The contribution of agriculture sector to GDP is higher in generating employment and income opportunity to the rural people and higher potentiality of industry as well as service sector capacity. Therefore, GDP is major factor that has multifacets effects in creating the employment opportunities. Therefore this study is undertaken to examine the relationship of some major contributors to GDP growth of Nepal which is legitimate to explore. This study reflects state of economic growth rate of Nepal which is deepening on advancement and development of every sector of an economy. Now days, the relationship between GDP and key contributors

have the important role in measuring the economic growth of Nepal. Hence this study intends to assess the relationship between roles of the major contributors to GDP and economic growth of Nepal and find out the significant relationship between major key factors and the Nepalese economic growth to draw the conclusions for further policy reform.

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) Whereas if the ownership of land is not highly skewed then agricultural growth is more effective in rural poverty reduction in comparison to industrial growth (Datta and Ravallion 1998; Timer 1979 and Thirtle 2001). Moreover existing literature presented that economic reform is one of the important factors contributing to the overall economic growth in general and to the growth of service sector in particular in India (Banga and Golder, 2004; Jain and Nian, 2010) Likewise, the key indicators of labor market (KILM) of ILO estimated the labor force ratio for year 2018 and it will be 69%, 13% and 19% in agriculture, industrial and service sector respectively (United Nation, 2013). However, according to the Economist Intelligence Unit HDI score of Nepal was only 0.43 in year 2013(Institutes for Integrated Development Studies, 2014).

Nepal's real GDP was estimated to grow by 5.0 percent in FY 2014/15. Such growth rate, however, is estimated to stagnate at 3.0 percent at basic prices against the growth rate of 5.1 percent in 2013/14 fiscal year. Unfavorable climate for agriculture sector and adverse impact on non-agriculture sector's activities due to earthquake of April 25, 2015 are attributable for such low economic growth rate in current fiscal year (Economic survey, 2014/15). Moreover, devastating earthquakes late in Fiscal Year 2015 cut economic growth in Nepal, and a surge in worker remittances expanded the current account surplus. Growth is expected to slide markedly in FY2016, affected by reconstruction delays, extended trade and transit disruptions as minority groups object to features of the newly announced constitution, and

an unfavorable monsoon. Economic growth of the country (at the basic price) is estimated to remain at 0.77 percent in FY 2015/16. GDP recorded a growth of 2.32 percent growth rate in the previous fiscal year. The economic growth rate in FY 2001/02 had recorded 0.16 percent, which once again went below 1 percent in current fiscal year for the second time. The economic growth rate shrank owing to negative production rate of mines and quarrying, industry, electricity, gas and water, construction, wholesale and retail trade, hotel and restaurant sectors, and the low growth in agriculture sector that occupies one-third proportion in GDP (Economic survey, 2015/16). In addition, recovery in FY2017 is contingent on accelerating reconstruction and restoring trade and transit to normal. (Asian Development Outlook, 2016).

To summarize on the whole, GDP is the main source to measure the economic growth along with the major economic contributors except quaternary and quinary sectors. The effectiveness of sector development and growth is low. On the other hand, the studies undertaken in growth measuring of Nepalese economic growth are not incorporated as an issue. Hence, a separate study seems to be necessary to examine the relationship between the key economic variables for economic growth in a time series framework.

Research Methodology and Model Use

This study is based on secondary data available from CBS Nepal. This study has followed trend, descriptive and quantitative analysis. For this study, economic variables such as GDP, agriculture, industry and service sectors are taken to examine the relationship among them. And statistical calculation is done through the Multiple Regression Analysis and Pearson's Correlation Coefficients. The study model like flexible Cobb- Douglas production function serves GDP is the main factor of economic growth of Nepalese economy. This study has examined the relationship between dependent and independent variable using Multiple Regression analysis.

Multiple regression equation can be express as:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 \dots \dots \beta_n X_n + e \dots \dots \dots (1)$$

Where Y is dependent variables,

β_0 = intercept, $\beta_1, \beta_2, \beta_3$ and β_n slope of independent variables and X_1, X_2, X_3 and X_n

are dependent variables and e is random variables.

The above equation can be expressed as follows:

$$Y = \beta_0 + \beta_1 \text{agriculture sector} + \beta_2 \text{Industrial sector} + \beta_3 \text{service sector} + e \dots\dots (2)$$

$$\text{GDP} = \beta_0 + \beta_1 \text{AS} + \beta_2 \text{IS} + \beta_3 \text{SS} + e \dots\dots\dots (3)$$

Where, GDP = Gross Domestic Product

AS = Agriculture Sector

IS = Industrial Sector

SS = Service Sector

e = random variable (unpredicted)

β_0 = intercept, $\beta_1, \beta_2, \beta_3$ are the coefficient (slopes)

Regression analysis Pearson's correlation coefficient has determined that the magnitude of the relationship of the variable. SPSS software is applied to fulfill the requirements using data available from Central Bureau of Statistics of Nepal.

Analysis and diagnosis

In this study, growth rate of neighboring countries' scenario, GDP Growth and Key sectors growth, Economic Growth Trend (at Base Prices), Growth Rate of Agriculture and Non-Agriculture sector, growth rate of Industry and Service Sector, Sector-wise Growth Rate, contributions in GDP (Percent) and the statistical analysis is done. Economic growth can be measured by the Gross Domestic Product (GDP) performance. The contribution of key economic factors and non economic factors have considerable share in Nepal's economic growth. In order to measure economic growth rate, key economic factors performance has been examined in this study. Change in sectoral growth performance definitely change in GDP. Average economic growth rate in last decade remained 4.1 percent at a basic price. Similarly, average growth rate of agriculture sector, industry sector and service sector has been reached 2.9 percent, 3.2 percent and 2.5 percent respectively during last decade.

Nepal's average growth report has taken 15 sectors. Similarly, National accounts 1993 have classified all economic activities into 17 sectors. But in this analysis; in order to measure economic growth, three major contributors to GDP are carried out.

Table 1:

Economic Growth Rate of Neighboring Countries (Annual Percentage Change)

Countries	2012	2013	2014	2015
Bangladesh	6.3	6.1	6.1	6.4
Bhutan	6.5	5.0	6.4	7.7
India	5.1	6.9	7.2	7.3
Maldives	1.3	4.7	5.0	1.9
Nepal	4.8	3.9	5.5	3.4
Sri Lanka	6.3	7.3	7.4	5.2
Pakistan	3.8	3.7	4.1	4.2
Afghanistan	14.0	3.7	1.5	1.5
China	7.8	7.8	7.4	6.9

Source: International Monetary Fund, April 2016

Table 1 shows Economic Growth Rate of Neighboring Countries in annual percentage. South Asian countries like Bangladesh and Afghanistan have higher economic growth in 2014. Indian economy is expected to grow further due to the expansion of investment and current policy reforms. Likewise China has continued to decline resulting of its structural problems.

Table No. 2 GDP Growth and Key sectors growth				
Year	GDP Growth	Agriculture sector Growth	Industrial sector Growth	Service Sector Growth
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
2014/15	2.32	0.8	1.5	3.6
2015/16	0.77	1.3	-6.3	2.7

Source: Central Bureau of Statistics Nepal

The above table shows GDP growth and contribution of key economic sectors growth of various FY 2001/02 to FY 2015/16. GDP is at constant price. Service sector contribution in 2001/02 and 2004/05 is lower than rest of all fiscal year. An average economic growth rate of Nepal reached 3.8 percent at a basic price. Similarly, agriculture and non agriculture sector growth rate in the last decade remained 2.1 percent and 4.3 percent respectively. Besides service sector growth rate in last ten years remained satisfactory. The growth was sufferer by negative returns of mines and quarrying, construction and infrastructure, electricity, gas and water, hotel and restaurants wholesale and retail business. Thus low growth in agriculture has led to one third proportion in GDP.

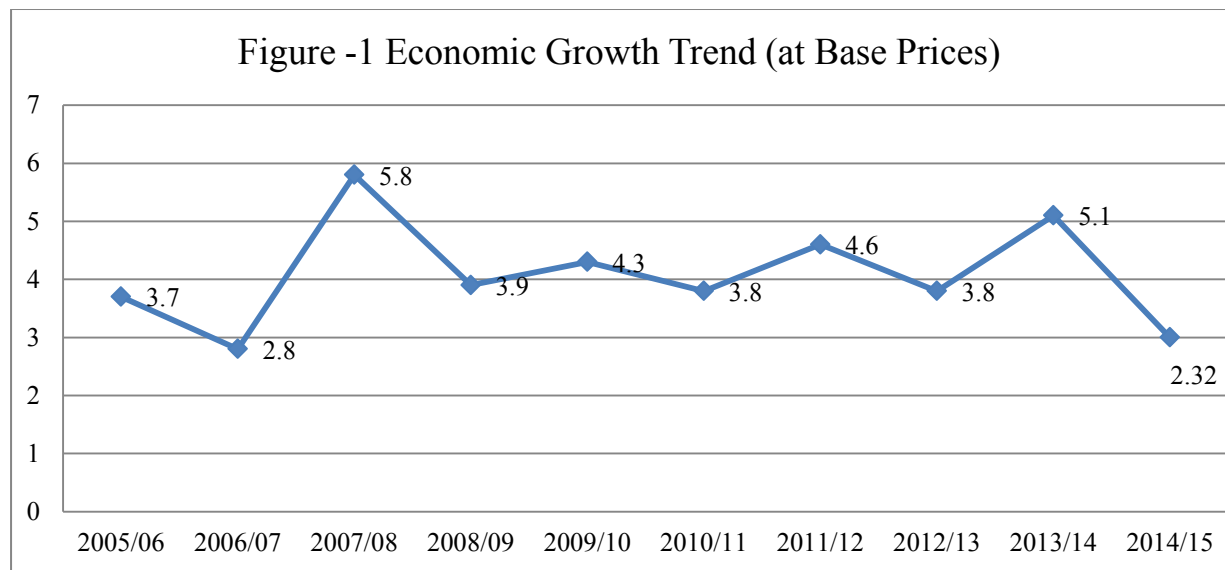


Figure 1 shows satisfactory economic growth of Nepal. The growth of last decade average growth is 4.1 percent at basic prices. The contribution of agriculture and non agriculture sector reached in average 2.9 and 4.8 respectively. Similarly, industry and service sectors recorded at 3.2% and 5.4% respectively.

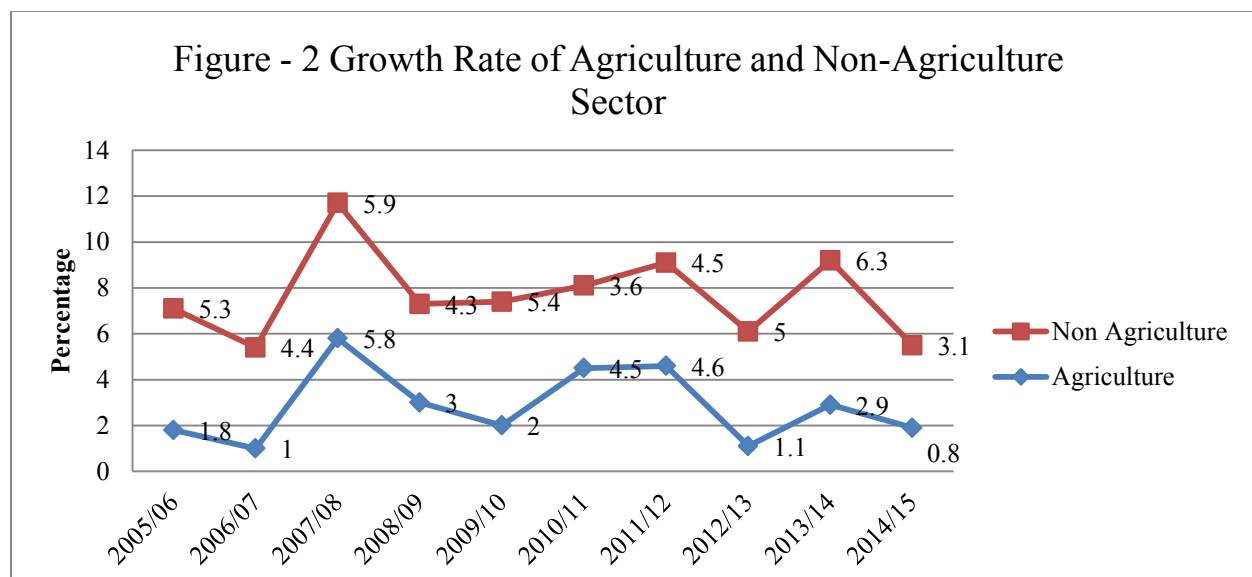


Figure-2 presents growth rate of agriculture and non agriculture sector of Nepal. Growth of the service sector is higher. Agriculture sector is influenced by seeds, climate and fertilizers.

A non agriculture sector is affected by shortage of energy, investment environment, labor problem and political transition.

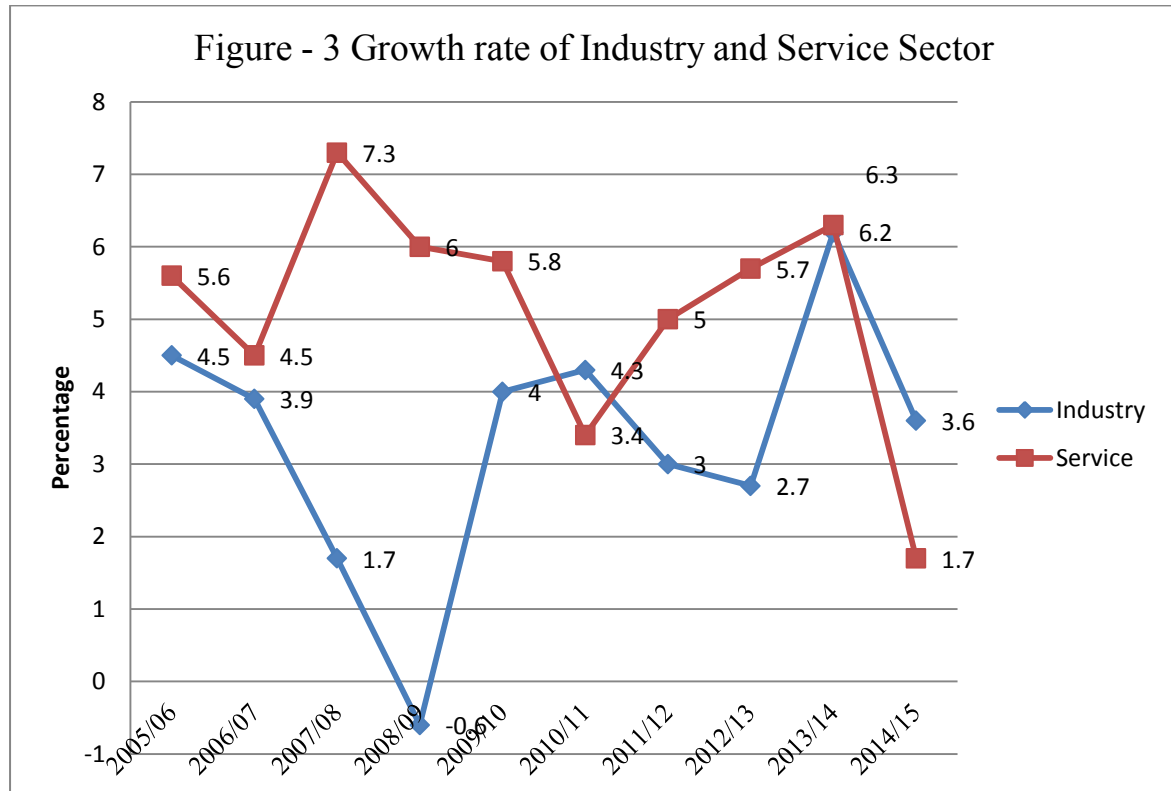


Figure-3 reveals growth of industry and service sector. Growth rate of these sectors had recorded at 6.2% and 6.3% respectively in FY 2013/14. Performance of mining and quarrying sector contribution is low but manufacturing sector performance was satisfactory though it was suffered by earthquake 25 April 2015. Likewise, growth rate of Gas, water and electricity has reached to 3.5 % in the FY 2014/15. Construction sector has low growth rate though it has been raised by 5.9 % in FY 2014/15. On the other hand, industry growth in FY 2014/15 has become 6.1% and 5.5% in 2015/16 fiscal year. Likewise, Wholesale and retail trades, hotel and restaurant, transport storage and communication performances have a record of significant contribution in a service sector. Since industries sector is back warded due to low level output of the manufacturing industries, entrepreneurship.

Figure - 4 Sector-wise Growth Rate

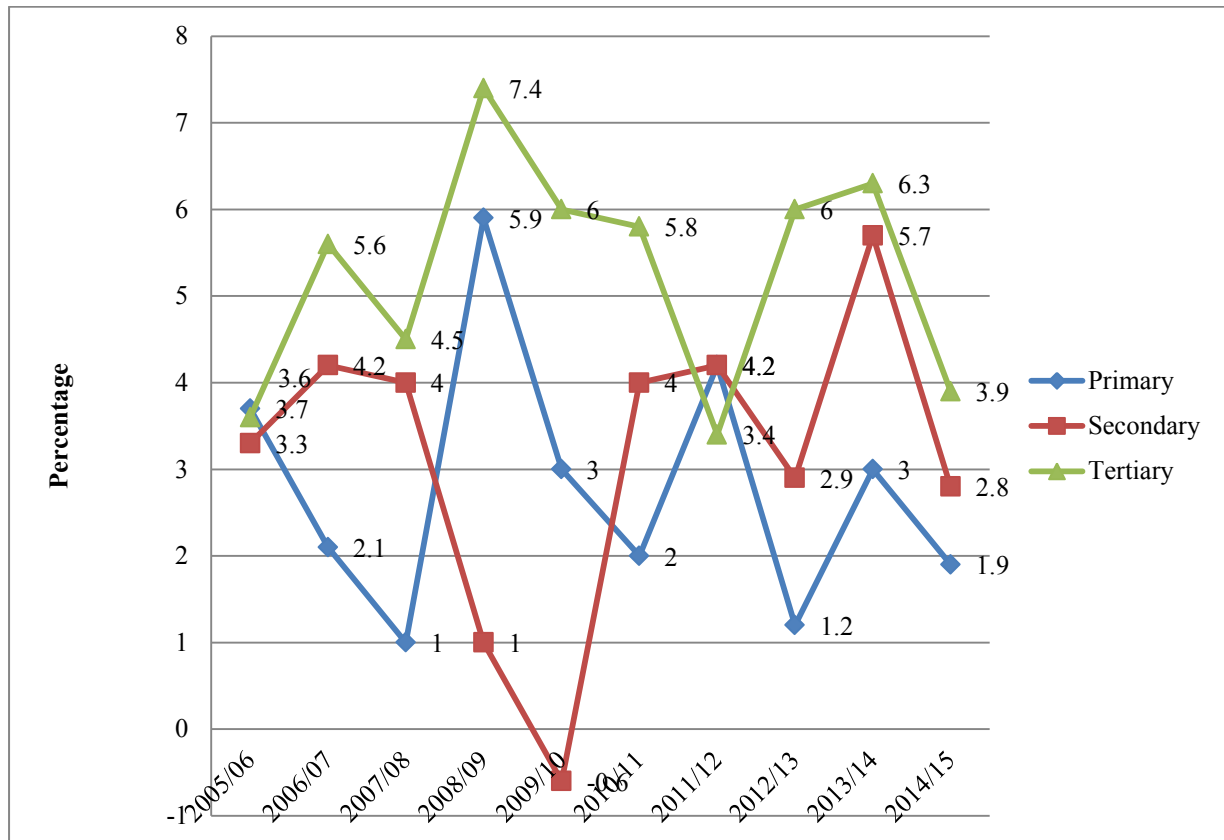


Figure- 4 portrays sector wise growth rate such as primary, secondary and tertiary sector. Primary sector average growth has been reached 2.9 % in FY 2013/14. Secondary sector average growth of last five years has reached at 3.2 percent. Similarly, average growth rate of tertiary sector of preceding five years has recorded at 5.4 percent. Tertiary sector consisting of storage and communication, public administration and defense, education, health and social work other community, wholesale and retail trade, hotel and restaurant, transport, financial intermediation, real estate and business activities, social and personal services.

Chart - 1 Contributions in GDP (Percent)

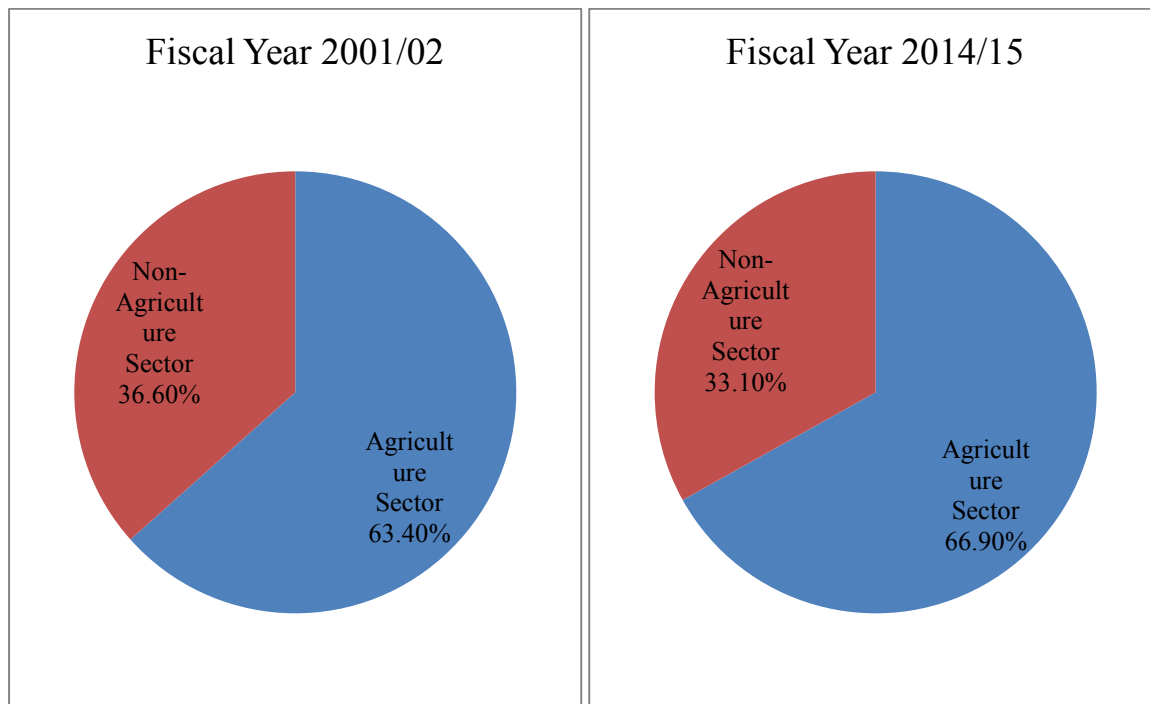
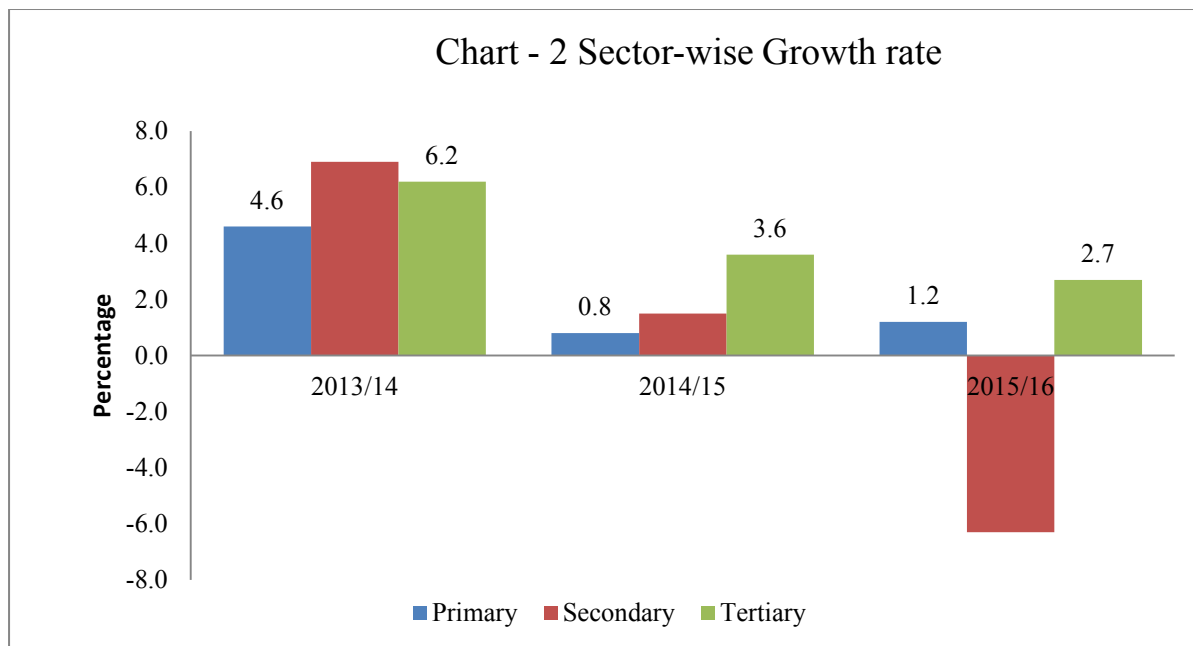


Figure - 5 shows the contributions to GDP in percentage. The contribution of non agriculture sector to real was 36.5 percent to GDP in FY 2000/01, which has recorded 33.1 percent in fiscal year 2014/15. On the other hand, non agriculture sector performance has reached 63.4 percent in FY 2000/01 and recorded 66.9 percent in FY 2014/15.



The chart 3 shows the growth rate of Primary sector, secondary sector and Tertiary sector growth rate from FY 2013/14 to FY 2015/16. The performance of Secondary sector has reached 6.9% in FY 2013/14, 1.5 in FY 2014/15 and became negative return by -6.3 in FY 2015/16. Likewise, tertiary sector was highest in FY 2013/14 and gradually falling in FY 2014/15 and FY 2015/16 by 3.6% and 2.7 % respectively. And primary sector growth rate has reached to 4.6%, 0.8% and 1.2% in respective fiscal year.

Table No. 3

Statistical Analysis

Variable	Unstandardized		t-Statistic	Sig
	Coefficient	Std. Error		
Constant	-0.0309	0.2175	-0.142	0.88
Agriculture	0.357	0.051	6.899	0.000
Industry	0.152	0.031	4.855	0.001
Service	0.471	0.037	12.462	0.000

R Square	0.967	F-Statistic	110.308
R	0.983	Sig. (F-Statistic)	0.000
Adj. R Square	0.959	Sum of Square Residuals	1.017
Standard Error of Estimate	0.003040		

Table number three presents Pearson's correlation coefficient R value which is greater than 0.98 implies that the positive relationship between GDP and key economic sectors of an economy of Nepal. R^2 indicates other variables. The test statistics $F = 110.307$ with - value $P < 0.05$ means that key economic sectors are significant to predict GDP. P-value of key economic sectors is less than 0.05 which exhibits significance of individual sectors to determine the GDP value at 95% confidence level. On the basis of this proof, the findings of multiple regression equation can be expressed as: $GDP = -0.0309 + 0.357AS + 0.152IS + 0.471SS$.

Conclusion

This study has focused on relationship between the predictor variable and criterion variable. The outcome of the research portrays the significant relationship between GDP growth rate and key economic factors such as agriculture sector, industry sector and service sector growth and development. On the other hand, service sector growth is a major contributor to the economic growth rate. In addition, result shows service sector may be the major source for the sustainable growth. Still, it has not been to develop holistically. Professional training to human resource, entrepreneurship education in the colleges and universities may increase the sectoral performance. Communications sector has increased the share of service sector in Nepal which is introduced with a high competition. There is high potentiality of agriculture industry sector and Information Technology development and their modernization. Similarly, there is high scope of entrepreneurship, industrialization and service sector growth. Therefore investment environment and spray of FDI in infrastructure development is a must for the long term economic growth. But the Nepal's political situation, climate

change, and earthquake have affected to the major contributors. Due to the low level of productivity of agriculture sector, industry sector and service sector, GDP growth rate has slow-moving. Inability of industrial development, vulnerability of agriculture, inadequate manufacturing, poor infrastructure, small market, labor problem, failure to achieve investment environment are challenges to achieve higher growth through sustainable development.

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