

## Multiplier Effect of Investment in Nepalese Economy

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### ABSTRACT

Investment refers to the expenditure made on physical and human capital and is one of the components of gross domestic product by expenditure method. Multiplier effect explains the extent by which national income changes due to the change in the investment. This study aims to find out the relationship between total investment and economic growth and further estimates the multiplier coefficient of investment in Nepalese economy using linear regression model taking time series data from FY 2002/03 to FY 2022/23. Gross domestic product is the dependent variable and gross capital formation is an independent variable. The secondary data is collected from the publications of Nepal Rastra Bank is processed and analyzed by using SPSS statistical software. Gross capital formation of Nepal in that period represents the total investment. From the analysis of collected data, it is observed that there is positive and significant relationship between gross capital formation and gross domestic product. The estimated multiplier coefficient of investment is found to be 2.645 (t-value = 23.772; p-value <0.001).

**Key words:** Investment, Investment Multiplier, Economic Growth, Gross Domestic Product.

### 1. Introduction

Investment means the allocation of resources either by the government sector or private sector to produce goods and services in order to generate future income or gain profits. In other words, any injection of capital in an economy can be defined as investment. Investment plays pivotal role in fostering economic growth. The effect of increased spending by public and private sector on the national income depends on the coefficient of investment multiplier. Investment multiplier tells us how many times income increases as a result of an initial increase in investment (Acharya, 2022). The increased flow of spending in various sectors of economy like infrastructure, tourism, agriculture and industry causes increase in employment and income, leading to increased consumer spending. This stimulates further investment, thereby creating a ripple effect that amplifies the initial investment. Higher multiplier coefficient means larger increase in national income as compared to the increased amount of initial investment. In case of developing countries like Nepal government adopts expansionary fiscal policy more often in order to achieve higher economic growth. To examine the effect of this policy implementation, the study of multiplier effect of investment becomes paramount.

### 2. Statement of Problem

Developing countries like Nepal needs surge in economic growth. Thus, it becomes imperative to understand the consequence of multiplier effect of investments for policymakers and stakeholders. Various research have been conducted to study the relationship of overall government expenditure, government capital expenditure, export and import with the economic growth of Nepal. Kunwar (2019) studied the impact of government expenditure in economic growth of Nepal by using ARDL approach and found that government expenditure has significant and positive impact on real GDP. The empirical study by Mahara (2021) observed the relationship between money supply, inflation, capital expenditure and economic growth in Nepal and found that capital expenditure has substantially induced economic growth in the long-run while in the short-run it has insignificantly hampered growth. There exists a gap in comprehensive research that studies the multiplier effect of total investment (the sum of government investment, private investment and change in stock which can be also termed as gross capital formation) on the economic growth of Nepal. This study aims to address this gap by raising a couple of research questions;

- i. Is there any relationship between gross investment and economic growth of Nepal?
- ii. To what extent the gross investment affects the national income of Nepal?

### 3. Objective of the Study

The objectives of this study are;

- i. To show the relationship between gross investment and economic growth of Nepal.

- ii. To determine the coefficient of investment multiplier in Nepalese economy.

#### 4. Research Methodology

For this study, quantitative research method is used to estimate the multiplier effect of investment on national income of Nepal. Gross capital formation represents the amount of gross investment and gross domestic product represents the national income. The time series data of gross domestic product (GDP) and gross capital formation (GCF) of Nepal from FY 2002/03 to FY 2022/23 has been taken for analysis. The secondary data are collected from the Current Macro-Economic and Financial Situation, published by Nepal Rastra Bank.

The bivariate linear regression model is used for the analysis and interpretation of data where GDP is a dependent variable and GCF is an independent variable. GCF is the sum of government investment, private sector investment and change in stock. The regression model is expressed as;

$$GDP = \alpha + \beta GCF + \varepsilon$$

where; GDP = Gross Domestic Product (dependent variable)

GCF = Gross Capital Formation (independent variable)

$\alpha$  = the Y – intercept

$\beta$  = the regression coefficient

$\varepsilon$  = error term or disturbance

#### 5. Review of Literature

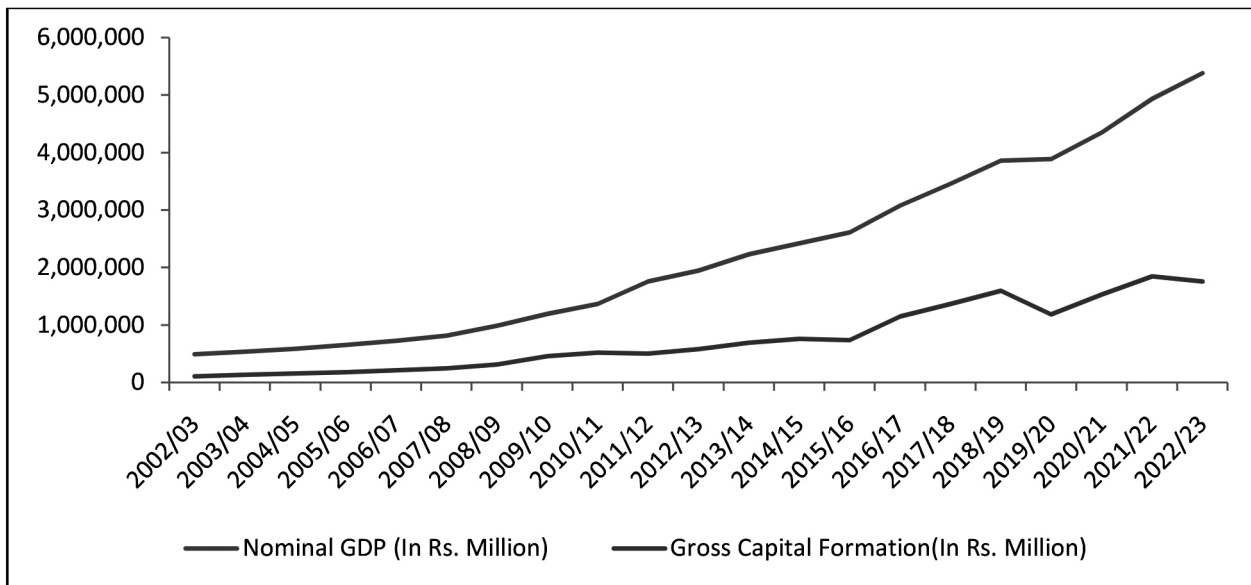
The analysis of fiscal multiplier, investment multiplier and foreign trade multiplier has been the area of concern for many researchers around the world to examine their effect on economic growth which plays significant role in the policy making process. Chaudhary and Acharya (2018) studied the casual relationship between government expenditure and real income in the context of Nepal. They used time series data from 1975-2015 and analyzed the relationship through Autoregressive Distributed Lag Model (ARDL) to Cointegration analysis. They observed positive and significant relationship between public expenditure and economic growth in short-run and long-run. Similar approach is used by Abiola (2019) to estimate the investment multiplier in Nigeria. From the analysis of time series data spanning 38 years, the study found that for every 1 unit rise in investment gross domestic product increase by 0.55 units.

The coefficient of investment multiplier of Hajj funds in Indonesia is estimated to be 1.66 which means for each Rp 1 billion increase in investment by BPKH, the GDP of Indonesia increases by Rp 1.66 billion (Andni, Widodo, & Afendi, 2023). Deleidi et al. (2021) estimated fiscal multipliers in Italy at national and sub-national level using panel SVAR analysis of regional data from 1995-2017. The study discovered that expansionary fiscal policies produce positive and persistent effects on GDP. The effect of discretionary fiscal policy is such that the fiscal multipliers remain larger than 1 even after 10 years of policy implementation.

The study conducted by Tandan and Kafle (2021) also used time series econometric tools to establish the relationship among the imports, exports, investment and economic growth in case of Nepal. The data taken from 1974/75 to 2018/19 AD is estimated using log-linear regression model and observed the short and long-run association of investment and export in achieving high economic growth. Pradhan and Yadav (2002) also examined the role of saving, investment and capital formation in economic development of Nepal. The empirical analysis is based on Polynomial Lag Model using annual data from 1974/75 to 2000/01 at current prices. The estimated regression equations showed larger impact of current values of saving, investment and capital formation on economic development with respect to the past values of respected variables. Papaioannou (2016) observed the role of public sector efficiency in shaping the relation between public investments and economic growth of EU countries. A standard VAR model is used to estimate the fiscal multiplier and found that the multiplier of government investment is positive for most of the EU countries.

#### 6. Analysis and Interpretation

The time series data of gross domestic product and gross capital formation from FY 2002/03 to FY 2022/23 is extracted from the Current Macro-Economic and Financial Situation published by Nepal Rastra Bank. The line graph of GDP and GCF is represented in the figure below to show the trend of the variables.

**Figure 1****GDP and GCF from FY 2002/03 to FY 2022/23 (In Rs. Millions)**

Source: Current Macro-Economic and Financial Situation, 2010/11 and 2022/23

In the figure, the trend of gross domestic product and gross capital formation is shown from FY 2002/03 to FY 2022/23. Both GDP and GCF shows increasing trend. However, in FY 2015/16 and FY 2019/20 the value of gross capital formation and gross domestic product declines by larger extent. The increased difference between the two trend line shows that increase in gross capital formation is associated with greater increment in gross domestic product.

The bivariate linear regression model mentioned in the methodology section is processed with SPSS statistical software to find out the relationship between the GDP and GCF and also to estimate the regression coefficient of gross capital formation. The outcomes of the regression analysis is presented and interpreted.

**Table 1 Model Summary**

Variables	R	R <sup>2</sup>
GDP GCF	0.984	0.967

Source: Author's calculation using SPSS

In the Table 1, the value of correlation coefficient is 0.984 which shows high degree of positive correlation between GDP and GCF. The value of R<sup>2</sup> is 0.967 shows the performance of the regression model was good fit for significance at 5% level of significance. Also, it indicates that 96.7% variance in dependent variable (GDP) can be explained by the independent variable (GCF).

**Table 2: ANOVA**

ANOVA <sup>a</sup>						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	46946304571084.310	1	46946304571084.310	565.087	.000 <sup>b</sup>
	Residual	1578482248810.640	19	83078013095.297		
	Total	48524786819894.950	20			
a. Dependent Variable: GDP						
b. Predictors: (Constant), Gross Capital Formation						

Source: Author's calculation using SPSS

Table 2 shows the model is significant. It means the predictor variable is the good predictor of outcome variable. [F (1, 19) = 565.087, p = .000]

**Table 3 Coefficients Model**

Variable	$\beta$	T	P – value
Constant	235471.319	2.230	.038
GCF	2.645	23.772	<.001

Source: Author's calculation using SPSS

In the Table 3, the estimated value of constant ( $\alpha$ ) = Rs. 235471.319 million and the regression coefficient ( $\beta$ ) = 2.645. There is significantly positive relation between the GDP and GCF (t-value = 23.772; p-value = <0.001). It means that if we increase the gross capital formation by Rs. 1 million then gross domestic product increases by Rs. 2.645 million. The coefficient of investment multiplier is 2.645.

## 6. Conclusions and Discussions

There is positive and significant linear relationship between investment and economic growth in Nepal. The value of regression coefficient of gross capital formation ( $\beta = 2.645$ ) shows considerable multiplier effect of investment on economic growth of Nepal. It can be concluded that implementation of appropriate fiscal policy measures which will increase both government investment and private investment can have positive effect on economic growth of Nepal.

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**Appendix**  
**Research Variables (Rs. In Millions)**

<b>Year</b>	<b>Gross Domestic Product</b>	<b>Gross Capital Formation</b>
2002/03	492,231	105,383
2003/04	536,749	131,671
2004/05	589,412	155,907
2005/06	654,084	175,633
2006/07	727,827	208,779
2007/08	815,658	247,272
2008/09	988,272	313,029
2009/10	1,192,774	456,489
2010/11	1,366,954	519,268
2011/12	1,758,379	502,944
2012/13	1,949,295	578,485
2013/14	2,232,525	691,772
2014/15	2,423,638	758,052
2015/16	2,608,184	736,577
2016/17	3,077,145	1,148,546
2017/18	3,455,949	1,366,752
2018/19	3,858,930	1,596,777
2019/20	3,888,704	1,183,732
2020/21	4,352,550	1,530,513
2021/22	4,933,697	1,846,017
2022/23	5,381,335	1,754,158

Source: Current Macro-Economic and Financial Situation, 2010/11 and 2022/23 (NRB)