

# Causality between Economic Growth and Investment in Zimbabwe

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## Abstract

The paper aimed at investigating the causal relationship between investment and economic growth in Zimbabwe using Granger causality methodology. Results revealed that causality does not run in any direction and hence the two are independent. These results are not the only one in literature since they are in line with others such as Verman and Wilson (2005) but are contrary to those of Samake (2008). It is recommended that Zimbabwe should invest in modern day technology to improve its growth.

**Key words:** Economic growth, investment, causality, Zimbabwe

## 1. Background to the Zimbabwean Growth and Investment

Since attaining independence from Britain, Zimbabwe's economy has been on a free fall especially in terms of economic growth. The first decade and a half were however better than what later followed. Gross Domestic Product (GDP) is seen to be generally on an upward trend from 1980 up to the 1992 drought which brought the economy to a whopping -9.02% economic decline, ([www.worldbank.org/data](http://www.worldbank.org/data)). For the period under review, however, investment, as proxied by gross capital formation as a percentage of GDP was growing to average 16.9% with a standard deviation of 3.69. The most compelling thing then is, even if investment was growing, GDP fell for the last part of the period. This goes against conventional economics wisdom that investment is the engine for growth. Some economists generally believe that economic growth emanate from investment, through the so called multiplier effect, while others believe it is growth that lead investment, the so called accelerator theorem.

It is therefore, from the above argument, inconclusive as to which leads the other. The aim of this research paper is to give an analysis of this relationship to reveal the direction of causality that is, testing the applicability of the multiplier-accelerator theorem.

This paper is organized as follows: The next section reviews relevant literature followed by model specification. The fourth section presents the results and analyse them and the paper is wrapped up in the last section by recommendations especially to policy-makers.

## 2. Review of Relevant Literature

Literature has it that investment is the engine for economic growth. It is argued that the availability of investment funds enables people to invest since this availability will make the cost of borrowing relatively cheap. The argument is that the major source of funds is borrowing such that a reduction in interest rates that is lending rates will lead a surge in demand for loans for investment purposes. This is because projects that were previously marginal will now be profitable.

It was Samuelson (1939) in Westerhoff (2006) who introduced the concept of the multiplier-accelerator. The model as argued by Westerhoff (2006) may generate temporary business cycles. The argument of the multiplier-accelerator theory is that autonomous expenditure lead growth via the multiplier but growth in turn has a feedback effect on induced investment in the economy via the accelerator process. This then implies a question as to which one actually perpetuates the change in the other especially in the long run.

Jayachandran and Seilan (2010) studied the causal relation between trade, foreign direct investment and economic growth in India. The variables were found to be cointegrated meaning a long run relationship could be established. The findings using Granger-causality test revealed independency among the variables for the period 1970 to 2007.

Acosta and Loza (2005) carried out a study on the short run and long run determinants of private investment in Argentina for the period 1970 to 2000. Findings indicated positive cointegration between private investment and output with a long term elasticity of 2.1%. Crowding out effect was evident in this study. Also investment decisions were found to be determined by exchange rates and trade liberalization in the short run. However, in the long run capital accumulation was seen to be closely dependent on both well developed financial and credit markets and on perspectives of fiscal sustainability.

Samake (2008) employed the coherent set of structural vector-autoregressive (SVAR) method to model investment and growth in Benin. It was found out that public investment and private capital formation facilitated by access to financial services had a significant impact on growth. The analysis supports the crowding in effect of public investment.

A study by Ouattara (2004) in Senegal revealed that public investment, real income and foreign aid flows affect positively private investment, while the impact of credit to private sector and terms of trade was negative. The study derived the private investment function using Johansen cointegration technique and Johansen (1988) and bounds test by Pesaran et al (2001).

A multivariate analysis of savings, investment and growth in India was carried out by Verman and Wilson (2005). The analysis used full information likelihood to establish long run cointegration equilibrium and short run Granger dynamics for the non stationary time series data. The findings support the popular view that increases in savings are a necessary condition for economic growth. However, the link from investment to output was found missing, meaning there was no causality from investment to output. Thus the Solow endogenous growth models could not be supported from this study.

### 3. Methodology Employed

The study employs the Granger (1969) causality test. Granger (1969) and lately Mandishekwa and Manzote (2010) argued that if the inclusion of past values of X still significantly contribute to the explanation of Y in a regression of Y on its past values and other relevant information, then X is said to Granger-cause Y. In this research, the model to be employed is specified using simple Granger (1969) specification as follows:

$$GDP_t = \alpha \sum GDP_{t-1} \text{-----} 1$$

$$I_t = \beta \sum I_{t-1} \text{-----} 2$$

$$GDP_t = \delta \sum GDP_{t-1} + \phi \sum I_{t-1} \text{-----} 3$$

$$I_t = \eta \sum I_{t-1} + \gamma \sum GDP_{t-1} \text{-----} 4$$

In this specification, equations 1 and 2 are the restricted Granger causality equations while 3 and 4 are the non restricted ones. Again of note is that in these equations:

$I_t$  represents investment in period t proxied by gross capital formation growth.

$I_{t-1}$  is lagged investment.

$GDP_t$  is the gross domestic product in period t which is a proxy for economic growth in that period.

$GDP_{t-1}$  is the lagged gross domestic product.

In this specification, investment Granger causes GDP if  $\phi$  is not statistically significantly equal to zero, while GDP Granger causes investment if  $\gamma$  is not equal to zero. If both of these conditions hold then there is bidirectional causality between the two variables. However, if none of them exists then we say there is independence between the variables.

#### 4. Results Presentation and Analysis

##### 4.1 Unit Root Tests Results

Stationarity tests of the variables were carried out and results revealed that all variables were stationary at all critical levels. GDP was found to be level stationary while investment was stationary of order 1. The unit root tests results are summarized in Table 1 below.

**Table 4.1: Unit root test results**

Variable	Order of integration
GDP	0
I	1

Given that all variables are stationary as revealed by Table 4. 1, the author proceeded to test for cointegration. Cointegration test was performed using the Johansen (1988) methodology. Results revealed presence of at most one cointegrating equation. From this we can safely conclude that the residuals are integrated of order zero, I(0).

##### 4.2 Pair-wise Granger-Causality Test Results

Results based on E-views 4.0 are presented below. Data is for Zimbabwe spanning from 1980 to 2005 obtained from World Bank statistics. The null hypothesis tested is that GDP does not Granger cause Investment and vice versa.

**Table 4.2: Pair-wise Granger-causality Results**

Lag	Direction of causality	F-statistic	P-value
1	I → GDP	2.06335	0.16475
1	GDP → I	0.11179	0.74128
2	I → GDP	1.60949	0.22609
2	GDP → I	0.06572	0.93661
3	I → GDP	1.14542	0.36093
3	GDP → I	0.05893	0.98057

##### 4.3 Results Interpretation

The findings reveal that investment measured by gross capital formation as a percentage of GDP and GDP are independent. Thus there is no causality from any direction between the two variables. The F-statistics and p-values all reveal that we cannot reject the null hypothesis of no causality. Results for lag 4 up to 8 were also tested and they revealed the same results as the first three lags. Thus for Zimbabwe we can safely say for the period under review, the multiplier and the multiplier-accelerator concepts cannot be confirmed. Other factors besides investment could have caused economic growth. Also other factors other than GDP could have contributed to investment growth.

The results of the paper are in line with the findings of Verman and Wilson (2005) who found a missing link between investment and output as a measure of economic growth in India. Also in conformance with these results are the findings by Jayachandran and Seilan (2010) for India again. The findings, however, contradict

those of Samake (2008) who found out that public investment and private capital formation has significant impacts on growth.

## 5. RECOMMENDATIONS

Since the findings reveal independence between the two variables, it means that policies aimed at promoting one can be formulated and implemented without affecting the other variable. It is of paramount importance however to note that even though the findings reveal independence conventional wisdom of investment being an engine for growth cannot be overridden.

The government is advised to make the investment playing field level. This can be so through removal of policies such as 51% local versus 49% foreign ownership of companies. This goes against the business motives of investors. This is so because the majority of big investors are foreigners that is Transnational Companies. This means that once these are discouraged then the whole investment fraternity is in doldrums. Again the government should reduce corporate taxes since they discourage foreign and domestic investors. This causes flight of “hot money” to better tax regime countries.

Political instability within the period under review cannot be ruled out. The political environment was not conducive for investment hence investors were flying away to politically stable nations.

To boost economic growth it might be argued that investment in modern day production technology can be embarked on. Zimbabwe is lagging a bit behind in state of the art technology meaning it cannot make use of less costly methods of production in whichever industry it is in. Investment in irrigation schemes by constructing dams and embarking on rain-water harvesting projects cannot be overlooked since Zimbabwe is an agrarian economy. This will help in production all year long unlike relying on rain season only. It will also reduce effects of droughts like the memorable 1992 drought that brought economic decline to the tune of 9.02% which is the highest decline for the period under review.

## 6. CONCLUSIONS

The research found out that growth and investment are independent of each other in Zimbabwe at least for the twenty six years under review. This however does not deny any other relationship between the two and hence policies aimed at promoting growth should also be investment supporting since orthodox economics argue that investment is an engine for growth.

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World Bank : [www.worldbank.org/data](http://www.worldbank.org/data)