

## Keynes's View Versus Solow (A Case Study in Indonesia)

Djawoto<sup>1\*</sup>, Munawar Ismail<sup>2</sup>, Ghozali Maskie<sup>2</sup>, Khusnul Ashar<sup>2</sup>

1. Doctoral Program of Economics Science, Faculty of Economics and Business, University of Brawijaya

2. Faculty of Economics and Business, University of Brawijaya, Indonesia

\*E-mail: [djawoto0706@yahoo.co.id](mailto:djawoto0706@yahoo.co.id)

### Abstract

This research is aimed to determine the debate between Solow Growth Model and Keynes Hypothesis in the Indonesia. There are three (3) variables which are considered in this study, i.e.: Saving, Gross Domestic Product (GDP) and Foreign Direct Investment (FDI). The data are annual data from 1980 to 2012 which are all accessed from the official website of the International Monetary Fund (IMF). The result of Stationary test indicates that most of the variables which are considered in the stationary research are on 1st-degree difference. Whereas, the result of Moderate Multivariate Co-integration Test Result (Johansen Co-integration Test), indicate that there are at least two vectors are co-integrated in the long run. The results of the study by Toda-Yamamoto Causality (Modified Wald) Test Result shows that, Indonesia is more inclined to agree with the theory which is presented by Keynes i.e. in the case of Indonesia, GDP has the potential to encourage saving growth (Saving), therefore it can be concluded that saving rate in Indonesia is influenced by GDP and FDI. The result which has been found in this research is in accordance with the findings of other researchers i.e.: Abu (2010) in Nigeria, Waithima (2008) and Olajide (2009). It is expected that after this research has been conducted, some policies which can be developed to encourage the Indonesian economy will be concluded. From these result, the government may consider policy that favor to the presence of Foreign Direct Investment in Indonesia.

**Keywords:** Foreign Direct Investment , Gross Domestic Product , Saving, Cointegration and Toda-Yamamoto Causality Test

### 1. Introduction

The debate between the two theory parties about the opposing growth is happening until now. Growth theory loyalist opinion Solow who stated that higher saving precedes and leads to higher economic growth (Solow, 1956). After Solow, authors such as McKinnon (1973) and Shaw (1973) support the view that saving plays an important role in economic development. This is true since the enhancement of savings means the enhancement of investment level; therefore it accelerates economic growth (Sinha and Sinha, 1998). In the concept of life-cycle hypothesis, Modigliani (1970) stated that higher growth increases the richness of life when young (work) savers are relative to the retired (non-working) dissaveers, thus it increases the amount of economic savings. The increase in national saving, in turn, will lead to higher investment and expansion of output (in Abu, 2010). And then a lot of research of Sinha and Sinha (1998) asserted that the increase in the result saving with an increase in the formation of capital and investment; therefore it enhances the growth of national output in an economy. After the assumption has been put forward by Solow, other authors such as Jappelli and Pagano (1994), Alguacil et al. (2002) found that a higher deposit growth precedes higher economic growth. In fact, Olajide (2009) has findings that unidirectional causality runs from saving to economic growth indicates that the low level of saving may be responsible for slow and unimpressive economic growth in Nigeria (Abu, 2010). Moreover Alguacil et al. (2004) and Singh (2009) research provides support for the hypothesis that the growth of deposits encourages economic growth (AbuAl-Foul, 2010). In addition, the research from the World Bank (1993) stated that a high savings rate can explain differences in economic growth between developed and developing countries.

In the opposite parties, there is another growth theory that is as strong as which has been presented by Keynes. Proponents of this theory have point of view that the growth of output (or income) that causes the growth of saving. Proponents of this theory stated that the increase in output will lead to an increase in income, thus it increases the level of saving in the economy. Then, this point of view is supported by Carroll and Weil (1994) research which shows that economic growth precedes saving has been motivated further research which is meant to examine the causality direction between saving and economic growth. For this purpose, Gavin et al. (1997), Sinha and Sinha (1998), and Agarwal (2001) stated that economic growth has higher impact on higher savings (Abu, 2010).

The importance of knowing the causal relationship between economic growth and saving, it certainly cannot be ruled out since the economic variable relationship which is very complex in which it is very important to know what sort of variables that can provide a stimulus to other variables to come to move (Sajid and Sarfaz 2008 in Abu, 2010). An empirical analysis which is based on the theory, if the result of causality test indicates that the saving stimulates economic growth; therefore saving mobilization is very important in order to achieve the target i.e. high economic growth. But on the contrary, if economic growth that encourages savings then it

will accelerate economic growth and it is necessary to increase the proportion of savings.

A phenomenon of "conflict" over the opposite theory above has certainly made the writer interested in examining the causal relationship between saving and economic growth in Indonesia. Hypothesis testing which has been carried out of course in order to get the causal relationship direction in favor of one of these two mainstream theories. The results of this research can certainly give a little consideration of what sort of policies that can be taken to improve the economy of Indonesia.

In this research it will be discussed in depth which is started from the first part that is introduction, and then the second part is literature review, and the third part the methodology and the data will be discussed in depth, the fourth part the findings of the research will be presented, and the last part will contain conclusions and recommendations of policies that can be taken.

## 2. Literature Review

In this section the history of the controversy of two conflicting theories will be discussed.

### Neoclassic and Economic Growth Theory

Marginal or neoclassical theory is the theory of the level and distribution of national production which is based on the social endowment of production factors such as labor and "capital", production technology and consumer preferences. Pre-Solowian are focused on the determination of the long-period equilibrium with the endowment production factor, but this theory still consider the condition of economic growth. It is seen as the result of the enhancement of endowment factor. Talking about capital accumulation, economic growth is considered to be "endogenous" in the sense of that the character of neoclassical which depends on public choice (individual choice) between current saving and consumption. There is a firm relationship between the role of capital in distribution theory and the theory of growth. The existence of positive profit depends on the scarcity of capital as a result of the decision to save.

In the history of economic thought, economic experts discuss the process of economic growth that it can be grouped into four streams are streams i.e.: classical, neo-classical, Schumpeterian and post-Keynesian. Economists, who were born between the eighteenth century and the beginning of the twentieth century, were commonly classified as a classic stream / the Classic. The classic stream / the classics are distinguished into two groups, i.e.: the stream of Classical and Neo-Classical stream. From these two groups of economists Classical and Neo-Classical, spilling most of their attention on the analysis of the characters of community activities in the short term, only a few were analyzing the problem of economic growth. The lack of attention of these two groups on economic growth are primarily caused by their point of view which was inherited from Adam Smith's opinion, who believes that the market mechanism will create an economy which functions efficiently.

According to Schumpeter, economic development is not a harmonious or gradual process, yet it is a spontaneous and discontinuous change. Furthermore, according to Schumpeter, the following development is not gradual, but it contains a large uncertainties and risks, so it cannot be calculated in advance and this cause hesitations in developing the business further. According to Schumpeter, the most important factor for economic development is self-employed (entrepreneurs), since they are the people who take the initiative for the development of the national production. The experts in the Post-Keynesian growth theory try to seek to develop Keynes. In fact, the theory was developed by two economists alone, but since the core of the theory is the same, it is now known as the Harrod-Domar theory.

The Harrod-Domar Economic growth theory is a growth theory which is based on the theory of economic growth in developed countries. Moreover, it is the direct development of Keynes's macro economic theory that is a short-term theory then it becomes long-term theory.

In the Harrod-Domar model, investment has very important role. In the long term, investment has dual effect. On the one hand, investment influence the aggregate demand whereas on the other hand it also influences the national production capacity by adding the available capital stock. Harrod concludes that the national economy has always grown with the full production capacity which is described as steady economic growth (steady-state growth), the effect of demand which is generated from additional investment should always be balanced by the effect of its bid without any exception.

But investments which have been made by entrepreneurs who have expectations are not always the same from time to time, therefore the long-term economic equilibrium can only be achieved if the entrepreneurs' expectations are stable and its possibility to come to reality is very small, as it is stated by Joan Robinson (golden age). Harrod was also stated that once the balance was disturbed, the disturbance will push the national economy towards depression or secular inflation. Therefore, Harrod symbolizes the economic balance as the balance of the blade that is easy to slip and once it slips everything will be destroyed (so unstable equilibrium). Domar economic growth theory is similar to the Harrod's theory although there are also some fundamental differences between the two theories. The difference is particularly concerned about the lack of investment function on Domar's model, so the actual investment is not specified in his theory. Therefore, the difficulty in achieving a long-term steady economic balance for Harrod is caused by the difficulty of  $v$  and  $v_r$  similarity or growth rate is

required by the natural growth rate, while for the Domar difficulty emerges because of the tendency of people to make investments that are relatively too low (underinvestment). In fact, the Harrod-Domar theory is to analyze the problems about: the terms whether or how the state should be created in the economy to ensure that the ability to produce that always increases from time to time, as a result of capital investment will always be fully utilized.

### **Stages of Economic Development**

There are some experts who explained the theory of the stages of economic development, i.e.: Fredrich List, Bruno Hilderbrand, Karl Bucher and WW Rostow. Fredrich List was a laissez faire follower. He has an opinion that the concept of Laissez faire can ensure resources allocation optimally, although he demands the presence of protection for industries that are still weak. According to List, economic development will only occur if there is freedom in political organizations and individual freedom in community. He compiled the stages of economic development which was started from: savage primitive phase, agricultural phase, farming and factories phase, factory and trade.

Bruno Hilderbrand stated that the stages of economic development into 3 stages, i.e.: a barter economy or a natural economy, the economy of money, credit and the economy. According to Karl Bucher, economic development through three levels or stages, i.e.: production for its their own needs, the economy of the city and the national economy, in which the role of traders seem to be more important. According to the third stage, that the goods were produced for the market is not for its own sake.

Karl Bucher divides economic growth according to the distance which has been taken as the means of satisfying needs, from producer to consumer. Society is seen as a whole household, either as producers or consumers households. Economic growth according to Karl Bucher is as follows:

Covered households, it is a family unit which consists of a few people and do not have any relationship with the people or households outside their environment. Samples of covered households are in isolated tribes in the interior of Kalimantan and Irian Jaya. According to Karl Bucher, covered households were lasted until approximately the year 1000. Urban households, covered households are getting large and begin a relationship with other covered household, so this household is becoming more open. In urban households, means of satisfying needs which are generated by the public (households) are no longer used to fulfill their own needs. The goods which are produced by each household are started to interchangeable. The relationship between one households to another are becoming diversified. Each household was getting more advance and create a new society order which in the next development will form the urban households, Nation households, the relationship between the city and other cities has led to the emergence of the nation's households. Nation household is one unit economy that includes a country. The relationship with other cities is smoothened by the improvement of transportation and security of infrastructures and facilities.

The means of satisfying needs is getting more diversified and its quantity is increasing as well, both the type and the quantity, then comes the companies. World Households, the progress which has been made by one nation households is different with other nation household, both in production technology, efficiency, type and quantity of goods. As a result, the goods which have been produced by a nation households begin to flow into other nation households so that new marketing areas, due to excess production, no longer able to consume itself. This is the period which the presence of international trade is known.

### **Previous Research**

Saltz (1999) examined the causal relationship between savings and growth rate of real output for a group that consists eighteen Latin American and Newly Industrialized countries between 1960 and 1991. The author found that higher growth rate of real output causes higher growth rate of savings. Anoruo and Ahmad (2001) analyzed the causal relationship between the growth of domestic savings and economic growth for a sample that consist seven African economies (Congo, Cote d'Ivoire, Ghana, Kenya, Nigeria, South Africa and Zambia). The econometric results illustrated that economic growth Granger-causes the growth rate of domestic savings for all the countries except Congo where reverse causality was found. In addition, the authors discovered a feedback causal relation for Cote d'Ivoire and South Africa.

Waithima (2008) used the Hendry Model with a two-step method to model a saving function for Kenya. The author observed that a 1 percentage increase in GDP growth rate causes a 0.5 percentage increase in private saving. Moreover, the causality tests revealed a unidirectional causality that runs from per capita GDP to private saving. In Nigeria, Olajide (2009) employed the Toda and Yamamoto (1995) and Dolado and Lutkepohl (1996) methodology to investigate the direction of causal relationship between saving and economic growth in Nigeria during the 1970 and 2006 period. The causality test results showed the existence of a unidirectional causality between savings and economic growth and the complementary role of FDI in growth.

Jong, Ingram and Whiteman (1999) we have employed a formally estimated business cycle model, along with the observed behavior of U.S. output and investment, to study the implied joint behavior of shocks to total factor productivity and the marginal efficiency of investment over the stages of the business cycle. Our findings indicate that both shocks play important roles in driving cyclical activity. In particular, the total factor

productivity shock has a greater initial impact on output and investment, but the marginal efficiency of investment shock has a more lasting impact. Moreover, productivity shocks are reliable recession indicators and generally coincide with the onset of recessions, but recoveries, including the most recent one, generally involve interactions of both shocks. Clearly, there is merit to Keynes' view that shocks to the marginal efficiency of investment are an important source of business cycle fluctuations.

#### Methodology and Data

$$Y = \alpha_0 + \alpha_1 S + \mu_1 \dots \dots \dots (2)$$

The data which is used in this research is a time series data from Saving, FDI (Foreign Direct Investment) and GDP (Real Gross Domestic Product) Indonesia started from 1981 until 2012. All data have been obtained by accessing the official website of the International Monetary Fund.

This research has been conducted by using granger causality test and cointegration test to examine the relationship pattern between savings and economic growth. The applied modeling is adopting the theory which is presented by Solow and Keynes hypothesis.

The theory of the relationship between savings and economic growth is described by Keynes as follows (Abu, 2010):

$$S = \alpha_0 + \alpha_1 Y + \mu_1 \dots \dots \dots (1)$$

In Keynes's theory it is explained that the savings (S) is a function of income (Y) as described in the above functional form. On the contrary, Solow models the relationship between economic growth and saving is as follows:

$$Y = \alpha_0 + \alpha_1 S + \mu_1 \dots \dots \dots (2)$$

After equations between growth and savings are determined, then the first step is testing the unit root test. The test is to make sure that the time series in used is stationary or not. The ADF test (Augmented Dickey Fuller) is used as a standard test in time series data in this research.

The methodology we employ in this study is the Granger Causality Relatively new technique developed by Toda and Yamamoto (1995) Considered that robust for the cointegration technique, Followed by the new econometric tests such as unit root tests (ADF, Phillips-Perron) and a test of cointegration proposed by Johansen (1988). The underlining objective of this causality test is to Overcome the problem of invalid asymptotic critical values when causality tests are performed in the presence of nonstationary series or even cointegrated (Afzal, Rehman and Rehman, 2008).

#### Discussion

The discussion in this research is began with the unit root tests for each variable. The examination of the unit root which is used in this research is carried out by using ADF test and PP test. The consideration of using two different unit root tests is in order to find more consistent results.

Then, after the unit root test, the cointegration examination will be performed in order to see a long-term relationship of each variable with the other variables. The examination is carried out since most of the data which has been found is stationary at 1st degree difference (see table 1.).

The primary focus in this research is to see the relationship direction of each variable that can be seen from Table 3. In which Table 3 presents the relationship direction of each variable. From Table 3, it can be seen that Indonesia is more amenable to Keynes's hypothesis, who states that high economic growth of a country in the end will encourage saving (Carroll and Weil, 1994).

In the following Table 1 the result of unit root test will be displayed for the variable Saving (LTSAV), FDI (LFDI) and GDP (LGDP).  $\Delta$  symbol is the symbol for the variables tested in the 1st degree difference.

**Tabel 1.**  
 Test of Unit root hypothesis. Null Hypothesis : X has a unit root

Variable	ADF statistics			PP statistics		
	$\tau(i)$	$\tau(ii)$	$\tau(iii)$	$Z(t_\omega)(i)$	$Z(t_\omega)(ii)$	$Z(t_\omega)(iii)$
<i>LTSAV</i>	0.38	-3.99*	-3.93*	-0.01	-4.07	-4.02
<i>ALTSAV</i>	-7.21*	-7.13*	-7.05*	-8.46	-7.99	-7.85
<i>LFDI</i>	-1.44	-1.98	-2.08	-1.65	-2.21	-2.31
<i>ALFDI</i>	-4.82*	-4.76*	-4.03*	-4.81	-4.74	-4.67
<i>LGDP</i>	5.02*	3.63*	1.09	4.99	3.63	1.10
<i>ALGDP</i>	-2.86*	-3.39*	-4.51*	-2.76	-3.32	-4.47
<b>Critical value for observations</b>						
<b>Significant levels</b>						
<b>1%</b>	-2.64	-3.66	-4.28	-2.64	-3.66	-4.28
<b>5%</b>	-1.95	-2.96	-3.56	-1.95	-2.96	-3.56

Note: (i), (ii), and (iii) indicate the model statistics without either drift or trend, with drift and with drift and trend. The optimal lag length used for the ADF Test and lag parameters in the Phillips and Perron test (PP test) is determined based on the Akaike Information Criterion (AIC). \* Indicates the data is stationary at  $\alpha$  5%; Data show \*\* stationary at  $\alpha$  1%.

From the stationary test results above, suggests that most of the variables considered in the study stationary on 1st-degree difference.

Next, multivariate cointegration test results can be seen in Table 2. Cointegration In testing this, we will use the value of the trace and max eigenvalue statistics as requirements rejection or acceptance null hypothesis. In Panel (A) presented the results of Unrestricted Cointegration Rank Test (Trace Test) and Panel (B) Unrestricted Cointegration Rank Test (Maximum Eigenvalue Test).

**Tabel 2.**  
 Multivariate Cointegration Test Result (Johansen Cointegration Test)

Null	Alternative	Trace Statistic	5% Critical Value
<b>Panel (A) Unrestricted Cointegration Rank Test (Trace Test)</b>			
$r = 0$	$r = 1$	51.19	29.80
$r \leq 1$	$r = 2$	24.41	15.49
<b>Panel (B) Unrestricted Cointegration Rank Test (Maximal Eigenvalue Test)</b>			
$r = 0$	$r = 1$	26.77	21.13
$r \leq 1$	$r = 2$	19.59	14.26

Note: r is the number of co-integrated vector

The results of Cointegration test are presented in Table 2, it indicates that there are at least two vectors which are cointegrated in the long term. Its Trace statistic value of 24.41 is greater than the critical value ( $\alpha = 5\%$ ) 15.49. It can be concluded that the null hypothesis is rejected and accept the statement that two vectors are cointegrated. Other test results which has been performed by using Max Eigenvalue comparison with Critical Value Test ( $\alpha = 5\%$ ) also showed similar results. In the case of Indonesia, it can be concluded that the Saving variables, GDP and FDI have a long-term relationship. The Cointegration relationship between GDP and Savings is paralleled with the research which has been conducted by Abu (2010) who also has found a long-term relationship between Savings and GDP in Nigeria.

Furthermore, to answer the existing problem formulation, the Toda-Yamamoto Causality test is considered as an instrument which is used to detect the relationship direction between Savings and GDP. More complete results can be seen in Table 3.

**Tabel 3.**  
 Toda-Yamamoto Causality (Modified Wald) Test Results

	$\chi^2$	P-value
S Cause GDP	3.98	0.5525
FDI Cause GDP	9.06	0.1066
S, FDI Cause GDP	13.11	0.2175
GDP Cause S	27.90	0.0000*
FDI Cause S	34.20	0.0000*
GDP, FDI Cause S	79.84	0.0000*
S Cause FDI	3.78	0.5818
GDP Cause FDI	4.15	0.5281
GDP, S Cause FDI	11.36	0.3300

Note: Null Hypothesis: X Does Not Granger Cause Y

\* Reject the null hypothesis at  $\alpha$  10%

The result of the test indicates that, in the case of Indonesia, GDP growth could potentially encourage saving (Savings). It can be concluded that Indonesia is more amenable with the theory that is presented by Keynes. And in general it can be seen that the high GDP and FDI, will also encourage high saving rate in Indonesia. This conclusion is also supported by the research that was conducted by Abu (2010) in Nigeria, Waithima (2008) and Olajide (2009).

Over the last few decades, developing countries (including Indonesia) are aggressively tried to improve their economy growth through particular strategies in the field of investment. One of the strategies which has been implemented is by strengthening foreign investment in the country through the promotion policy of foreign capital investment which is reserved for multinational companies. This policy is generally based on a simple argument, that is the presence of foreign direct investment (FDI) in massive quantities will provide beneficial effects for the domestic economy. This advantage is justified by the possibility of technology spillover as a result of the presence of multinational companies.

In a broader perspective, there is sort of a concept which is mutually agreed among the host country states that multinational companies produce technology spillover in the form of products, production processes, distribution processes, management systems, and marketing strategies (Blomstrom and Kokko, 1998). Similarly, Dunning (1993) who stated that there is a benefit from the presence of multinational companies doing foreign investment in the host country since they have more advanced production technology, patents internationally recognized, the products that already have brand names, as well as effective marketing management strategies. This spillover process technology will help to increase the capacity or efficiency of production of domestic companies. In turn, improved efficiency in the company's production will boost the value of domestic wages because workers become more productive.

## 5. Conclusion

This research is meant to study the debate between Solow Growth Model and hypothesis Keynes in the country of Indonesia. It is expected that after this study that this research will be able to conclude that policies can be developed to encourage the Indonesian economy. The variables considered in this research are three (3) variables i.e.: Savings, GDP, and FDI. The data are annual data from 1980 to 2012 which have been accessed from the official website of the International Monetary Fund (IMF). The results showed that, Indonesia is more amenable with the theory that is presented by Keynes that the savings rate in Indonesia is influenced by GDP and FDI. The results found in this research is parallel with the findings of other researchers including the Abu (2010) in Nigeria, Waithima (2008) and Olajide (2009).

From these results, the government may consider their policies that in favor of the presence of FDI in Indonesia. On the one hand, FDI is defined as an "unfortunate" but on the other side it is also considered as a "blessing". With careful consideration and proper portions, the government can take advantage of the presence of FDI as one of the drivers of the Indonesian economy.

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