

# The Correlation of Economic Variables on Domestic Investment

Amirreza Attarzadeh

**Abstract**—This paper aims to investigate the relationship between economic variables, e.g., inflation rate, interest rate, trade openness and the growth rate of GDP, with domestic investment. The present study also draws on conceptual economy related theories to verify the negative effect of interest rates on domestic investment. However, trade openness and growth rate had a positive correlation, and the inflation rate may have a positive or negative impact on domestic investment.

**Keywords**—Inflation rate, growth rate of GDP, interest rate, trade openness, domestic investment.

## I. INTRODUCTION

THIS research study focuses on investigating the effect of economic variables such as inflation rate, trade openness, interest rate and growth rate on domestic investment relating to the Association of Southeast Asian Nations (ASEAN), which includes Malaysia, Philippines, Singapore, and Thailand, from 1976 to 2013.

## II. INVESTMENT CONCEPT

The literature of economy is enriched with various definitions for investment and discussing its direct and/or indirect impacts on economy related factors. The underlying concept of the investment can be found in the context of economy. Investment can be defined in terms of the concepts in macroeconomics, national accounts and financial economics. Accordingly, the gross capital formation in the form of gross domestic investment is the level of inventories, including outlays, in addition to the fixed assets of the company, plus the net change in the level of the inventories. For example, machinery equipment purchases or the construction of a road [1]. In the context of the economy, investment is defined as the “accumulation of newly produced physical entities” [2]. For instance, machinery or goods inventory and also buying goods that might not be useful currently, but might be beneficial/useful in the future for attaining wealth.

## III. THE INVESTMENT THEORY

The demand for investment is inevitably one of the focal cores whose origins can be found in classical theory stating that the demand for investment increases if the interest rate is reduced. Keynes found that investment governs demand, while saving is inter-related with the supply [3].

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The differences between the neoclassical theory and classical theory is that the former believes that investment and saving are not equal. Thus, this opinion is far removed from the opinion of classical theory which believes that investment and saving are equal, and any rise in saving results into an escalation in I/GDP [3], [4].

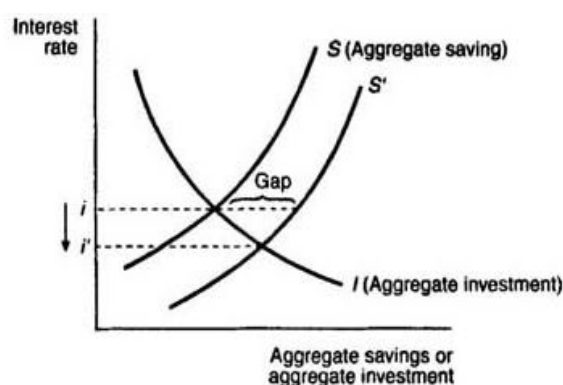


Fig. 1 Classical theory of interest rate adjustment in money market [3]

As shown in Fig. 1, S shows aggregate saving and I represents the aggregate investment. Aggregate saving and interest have a positive correlation which implies that if the interest rate is increased, higher saving is achieved and the interest rate will have a negative impact on the aggregate demand. When saving increases, S curve shifts to the right side and a gap appears between the investment and saving at  $i'$ . The equilibrium point of saving and investment at the same  $i$  can be noticed [3]. The two studies carried by two famous researchers explain and define the standard neoclassical theory [5]. Occasionally, the involved parties often determine their decision assessment based on individual rationality to maximize their own profit. If the production function has a constant flexibility of replacement, the real cost of the capital determines the capital severity of the production as the output. The coefficient of the capital cost has a direct impact on the investment demand as connoted by the neoclassical commentary in terms of the outputs [5]. Tomorrow is created by today and decisions for the future are not predictable. Based on Keynesian theory, the growth and safety of an investment can be conceptualized through close study of interest rates and thus the interest rate can directly affect the economic growth [6], [7].

#### IV. THE EFFECT OF INFLATION RATE ON THE DOMESTIC INVESTMENT

High inflation increases the uncertainty for future investment, thus people with a fixed income are reluctant to invest. To this regard, it can be claimed that inflation has a negative influence on I/GDP, and a loss of confidence for investment, as the uncertainties compound the situation. Consequently, most of empirical evidences point to a negative relationship [8], [9]. Inflation might have different effects on investments which are basically dependent on the economic conditions. Growth of money supply is the most important parameter that is related to inflation and if it is greater than the economic growth, the inflation rate will increase [10]. Able, a pioneering and well-known economist, investigated these two important subjects. First, he obtained the correlation between the inflation rate and investment spending; he claimed that if the inflation rate increases, investment spending will decrease. Secondly, he found that the high rate of inflation has a negative effect on tax policy [11]. Negative inflation, also referred to as deflation, is harmful when it leads into to higher demands. In this condition, people prefer to halt spending and are reluctant to invest since they are expecting that prices will decline. On the other hand, in this condition, unemployment increases. As a result, negative inflation has a negative effect on investment [12].

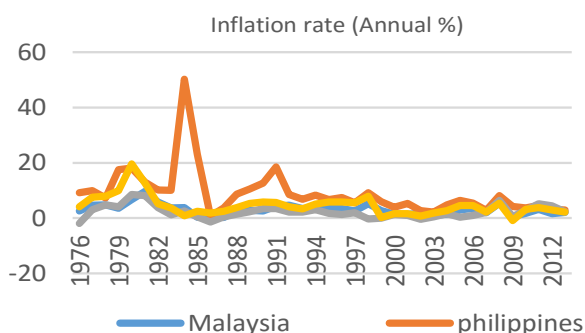


Fig. 2 Annual Inflation rate from 1976 to 2013 (Annual %) [1]

As in Fig. 2, fluctuation rates exists in all four cases. In this case, government tries to decrease inflation and increase domestic investment. In 1983, as the economic crisis happened in Philippines and by the following year the inflation rate increased to 50.33%. This resulted in some 59% of Philippians being recorded as living below the normal standard of living. A World Bank investigation also showed that unemployment had increased over this period [13]. In 1980, the inflation rate increased in Thailand had reached 19%, while over the coming years it declined to reach 0.84% by 1984.

#### V. EFFECT OF REAL INTEREST RATE ON INVESTMENT

Pettinger, a teacher of economics teachers at Oxford University, discussed the effect of high interest rates on economic variables. He believed that the inflation rate and interest rates have a direct relationship. He insisted on the

inverse relationship between the demand and economic growth and interest rates [14]. Interest rate targets are vital in regard to monetary policies and are taken into account when dealing with variables, such as investment, inflation and unemployment. Central banks attempt to lower the interest rate in order to increase their investment. However, when the real interest rate is low, it may cause an economic bubble. Additionally, a higher interest rate means a higher cost of borrowing which discourages consumers and firms from taking out loans to finance greater spending. The investment and lower interest rates reduces incentives to save and gives a smaller return on savings. High interest rates encourage people to save their money rather than spend it. When the interest rate increases, the value of money rises, and so people tend to save their money in the form of that currency. However, a higher interest rate has a negative impact on investment and consumer spending. The reaction of aggregated demand is contrary to that of interest rates, where high interest rates may cause recession and high unemployment [14], [15]. In Fig. 3, when the interest rate increases, investment decreases implying that there is a reverse relationship between these two variables. In Fig. 4, the direct connection between savings and the interest rate is considered [16]. In classical macroeconomic theories, the effects of saving and interest rates on investment are very important and have an impact on aggregate demand.

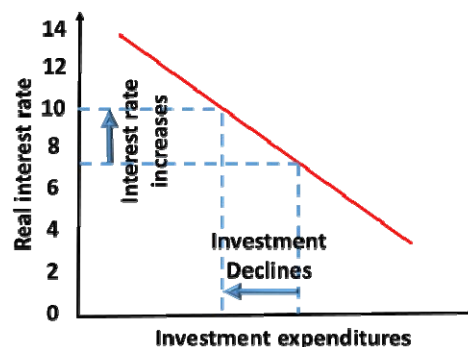


Fig. 3 Relationship between investment and real interest [16]



Fig. 4 Relationship between interest rate and saving [16]

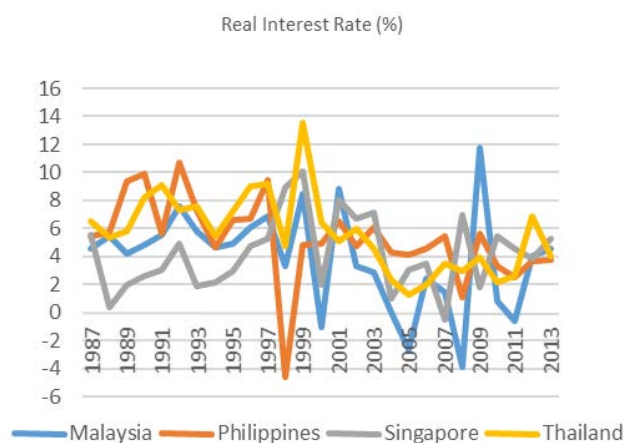


Fig. 5 Annual real interest rate from 1976 to 2013 [1]

As shown in Fig. 5, in 1998, the Philippines recorded the lowest interest rate in recent decades, falling to -4.5%. During the following years, the government increased the interest rate to 6.0% by 2003. The highest interest rate recorded in Philippines was 10% in 1992. The highest interest rate belongs to Thailand with 13.56% recorded in 1999. This came after the economic crisis that happened in the country in 1997, when the government increased the interest rate to encourage foreign investment into the county. In 2008, the global economic crisis happened and the interest rate in Malaysia fell to -3.90%. A year later the real interest rate was increased and reached as high as 11.78%.

#### VI. EFFECT OF TRADE OPENNESS ON THE INVESTMENT

Razin and Coury investigated the effect of trade openness and instability in their study. They believe that trade openness (TO) leads to more instability, which affects investment as it may appreciate or depreciate TO [17]. Skipton studied the relationship between TO, investment and long-run economic boost. He concluded that if trade openness is increased, then the opportunity of the domestic investment increases as well [18]. More recently, in an investigation done by Soltani, investment is shown to be the most important factor that reflects the relationship between TO and GDP growth. Domestic investment decreases due to strong global competition. With respect to this, he expected to achieve a positive relationship between investment and TO [19].

In general, one of the important goals for any country is to create favorable conditions in order to encourage the trade goods and/or service with other countries, which is an engine of growth for ASEAN countries. Singapore is very different in terms of its trade openness. Singapore has a huge open economy compared with the other countries, since trade contributed to 439% of GDP in 2008. Fig. 6 clearly shows the distinct feature of trade openness in Singapore's economy, placing it well above Malaysia, Philippines and Thailand. Interestingly, for Malaysia, Singapore and Philippines the trade openness seems to follow a downward trend from 2005 except for Thailand, which keeps its upward direction though with a milder steep.

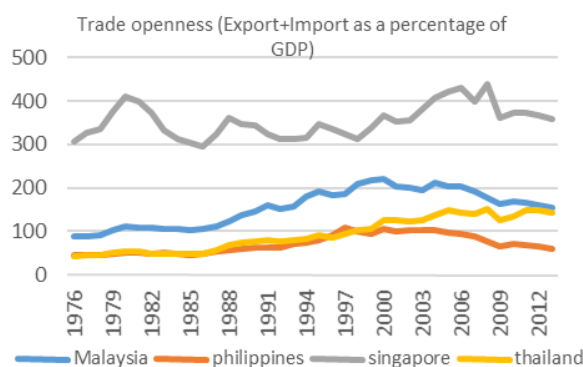


Fig. 6 Annual trade openness from 1976 to 2013 (% of GDP) [1]

#### VII. EFFECT OF GROWTH RATE ON INVESTMENT

Kuznets, a pioneering scholar who has conducted various studies on fixed investment, noted that the acceleration in the rate of economic growth had positive effect on domestic investment [20], [21]. Most recently, two researchers investigated the relationships of economic variables on income growth and the investment rate. He concluded that there is a rationale connection between income growth and the savings rate [22]. Economic growth and the savings rate are interdependent. In 1986, Ando and Hayashi investigated income growth in relation to Japanese savings. They found a positive relationship between these two variables. According to the results, which pointed to a positive correlation between I/GDP and economic boost, it was found that if economic growth increases, investment will be magnified. This results in a situation in which people prefer to save their money, rather than invest in the market [23].

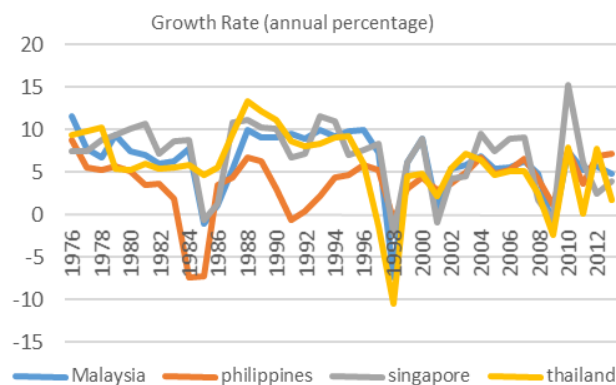


Fig. 7 Annual Growth rate of GDP from 1976 to 2013 [1]

According to Fig. 7, Philippines had the lowest growth rate prior to 1986, while in the following years, rates were increased to reached 6.20% of GDP in 1989. In 2011, Singapore reached the highest growth rate compared with other ASEAN countries, climbing to 15.24% of GDP. However, within a year this figure had dramatically declined to 6.05% of GDP. In 1997, during the Asian financial crisis, Thailand suffered a financial collapse of the Thai currency when the stock market lost its value, the growth rate of these

countries dramatically decreased. In 1998, the growth rate of Thailand was -10.51% of GDP, which was the lowest growth rate in that decade. Following these years, the government increased the interest rate to attract foreign investment in an effort to improve the economy.

#### VIII. CONCLUSIONS

Investigations of the most prominent economic parameters of ASEAN countries, as presented in this study, revealed that higher interest rates result in lower domestic investment in the region. The trade openness and growth rate of GDP have shown to have a positive impact on gross capital formation. However, a specific relationship, either positive or negative, cannot be prescribed for interest rates. Based on this study, future studies could investigate interactions between interest rates, trade openness, GDP growth and domestic investment. To meet this end, panel regression analysis and ordinary least square methods can be used to investigate the effects of economic variables on domestic investment with respect to each country. Additionally, the effects of the economic variables in the group of countries, in the form of the panel data, can be used to establish the relationship between the economic variables.

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