



## Business Cycle and The Macroeconomics Performance: Evidence of Malaysia and Indonesia

<sup>1</sup> Abdul Qoyum, <sup>2</sup>Miftahussurur, <sup>3</sup>Al-Amin Matae,  
<sup>4</sup>Muhammad Yousuf, <sup>5</sup>Abdurrahman

<sup>1</sup> Lecturer in Economics, Department of Islamic Economics  
Faculty of Islamic Economics and Business, State Islamic University Sunan Kalijaga  
Yogyakarta, Email: [agus.qoyum@yahoo.com](mailto:agus.qoyum@yahoo.com)

<sup>2</sup> Lecturer, Department of Islamic Business and Management  
TAZKIA University School of Islamic Economics

<sup>3,4,5</sup> Master of Finance, International Islamic University Malaysia

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**Abstract:** Stable economic growth is the major macroeconomic goal which is all nations seek. Economist and policy makers have been tried to find the ways to sustain and maintain stable economic growth. This paper examines the macroeconomic fluctuations and economic growth in Malaysia and Indonesia and its determinant by using multiple regression models. Five variables were chosen for the model namely variables are Money supply (MS), Industrial production (IP), Interest rate (IR), exchange rate (ER), Consumer price Index (CPI) and stock prices. The study shows that Money supply (MS), Interest rate (IR), exchange rate (ER), and stock prices are among others, the determinant factors of macroeconomic fluctuations in both countries. Specifically, the empirical results reveal that Interest rate (IR), exchange rate (ER), and stock prices has significant contribution to the performance of real GDP in Malaysia while Money supply (MS) and exchange rate (ER) are the main cause of macroeconomic fluctuations in Indonesia. This may be due to the different monetary policies pursued by the two countries. The two countries might have different monetary policy strategies; Malaysia pursues interest rate targeting policy, whereas Indonesia applies inflation rate targeting policy. The study recommends for both countries government policies play an important role in economic performance. Therefore, a careful policy should be the foremost important factor for economic in these nations and the every country in general.

**Keyword:** Economics Growth, Macroeconomic Policy, Business Cycle.

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### Introduction

Stable economic growth is the major macroeconomic goal which most or even all nations seek. Economists and policy makers have been entrusted to find ways to sustain and maintain economic growth in order to guarantee a higher and stable standard of living of their respective countries (Cheng, 2003). However, evidence suggests at least in the long run economic growth has never been stable but is interrupted by a periods of economic instability. Meaning that, the actual growth tends to fluctuate. In some years, there is a higher rate of economic growth and the country is at boom whilst other times the economy grows at slowly or even negative and the country is at recession. This cycle of boom and recession is known as business cycle or trade cycle.

Business cycle is a cycle of expansions occurring at about the same time in many economic activities followed by similarly general recessions, contractions, and revivals which merge the expansion phase of the next cycle; the sequence of change is recurrent but not

periodic; in duration business cycle vary from more than one year to ten or twelve year; they are not divisible into shorter cycles of similar character with amplitudes approximating their own (Burns and Mitchell, 1946).

Many economists agree that trade<sup>1</sup> can play a crucial role in linking economies and transmitting disturbances, the impact of trade linkages on the degree of business cycle synchronization is ambiguous (Kose, Prasad, and Terrones 2003; Shin and Wang 2004; Baxter and Kouparitsas 2005; Rana 2007a, 2007b). Therefore, the important of government in the current openness economic system is to ensure that the business cycle can work effectively to realize the economic objectives.

In the openness economy, macroeconomics variables are the crucial factor that determines the business activities in all of country around the world both developed and developing country. Every change in the economy either from domestic or international economy tends to cause the significant effect on the business cycle. In addition, classic trade theories such as the Heckscher-Ohlin model and Ricardian principles of comparative advantage suggest that with trade countries can benefit when they specialize in industries that are to their comparative advantage. Higher inter-industry specialization would cause the industrial structures of trading countries to diverge, potentially weakening global linkages. However, international trade may cause demand or supply spillovers across countries. When demand shocks drive consumption or investment booms in one country, the effects may spill over into its trading partners through increased demand for imports, which in turn boosts other economies (Brooks and Hua, 2008).

Furthermore, as noted by Shin and Wang (2004), international trade may affect macroeconomic policies (e.g., exchange rate, fiscal, and monetary policies) of some countries. More specifically, trade may lead to either policy coordination or beggar-thy-neighbor policies among countries, which, in turn, affect global economic links. For instance, to gain international market share for exported goods, countries that export similar products may compete with each other by depreciating their currencies. For their mutual benefit, trading partners or countries in production chains may need to coordinate with each other in setting policies relevant to trade.

There are many research conducted to study about the relationship of macroeconomic and business cycle. James H Stock and Watson (1998) conducted research about business cycle fluctuation in U.S macroeconomic. This research included as the comprehensive research that use more than 70 macroeconomic indicators as an independent variable. In addition, some literature said that there is significant effort for the government to ensure that the good macroeconomic variable can push the business cycle is better.

The main objective of this research is to find the impact of macroeconomic variable on the business cycle. There are many macroeconomic variables, but in this study we will use some main important indicator of macroeconomic, namely; Interest rate, Exchange rate, Money supply and Inflation. In addition as proxy for the business cycle this study use Industrial Production Index (IPI). IPI is used because of the limitation of monthly data.

## **Previous studies**

Macroeconomics emphasizes the interaction of various sectors in the economy. Hence any disturbance of one sector of the economy causes fluctuation in other sectors. Real business cycle is attributable to the cyclical ups and downs in economic activities to changes in productivity. Of all the reasons that changes productivity over time are most importantly improvements in technological for producing goods and service and improvement in the

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<sup>1</sup> Trade also reflects the business cycle, since it has important meaning: first, trade will explain the consumption power of market; second, trade will have multiplier effect to the whole of economy in county.

worker's skills that are most important. Meaning that, as a result of technological progress, the productivity of capital is supposedly increases over time. Similarly, as a result of, new skills, improved education, training and better health, the productivity of labor increases over time. Moreover, such as output, consumption, investment and hours worked also raise in the long-term trend. In addition above the average total factor of production is the means that macroeconomic variables tend to existing for some time and the reason boom exists for a while.

There are many research conducted to study about the relationship of macroeconomic and business cycle. Ming-Yu Cheng (2003), investigated the relationship between macroeconomic variables and the economic performance as measured by mean value of Gross Domestic Product (GDP) in Malaysia from 1975-2002. Specifically, Cheng examined how the fluctuations in money supply, budget deficit and domestic capital formation effect economic growth in Malaysia. The results indicated that money supply and government budget deficit affects the real GDP significantly. But capital formation does not. According to this results it looks like that it's in favor the interventionist argument where the government plays a fundamental role in influencing economic growth in Malaysia. However, may economists do believe on the other run that the economic growth is encouraged when private enterprises as allowed to flourish and that the entrepreneurs get reward in investment of new techniques and new products.

Mohamed et al. (2003) studied the relationship between consumer product and industrial product index with macroeconomic variables namely, interest rate (Base lending rate (BLR)), Inflation rate (Consumer Price Index (CPI)) and Money supply (M2) in Malaysia. The sample data was fifteen years. Results showed all have significant correlation with the index. BLR and CPI have negative relationship with consumer product and industrial product index in Bursa Malaysia. On the other hand, M2 has a positive relationship with consumer product and industrial product index in Malaysia. This means that all variables ( BLR, CPI and M2) have significant relationship with the stock market index.

Ibrahim and Yusoff (2001) analyzed the dynamic interactions among three macroeconomic variables (real output, price and money supply), exchange rate and equity prices for Malaysian case. Relying on variance decomposition and response impulse functions to know the strength of the interaction between the variables. They found that Malaysian stock price seemed to be driven more by changes in domestic factors, particularly, money supply. According to the authors money supply has positive effects on the stock price in the short-run but negatively associated in the long-run. Also the results indicated that the negative effects of depreciation shocks stock prices. So from this, by analogy, we conclude that monetary authorities should be very caution in implementing favorable monetary policies as it might adverse effects on the Malaysian financial markets.

Yusof and Majid (2007) in Malaysia conducted a comprehensive study by employing more complete variables and involved both conventional and shariah stocks. In that study, they examined the effect of monetary policy on stock market movements in the conventional and Islamic. The monetary policy variable are used is the money supply (MS) that includes M1 and M2, interest rate, exchange rate (ER), economic growth (GDP) that represented by the Industrial Production Index (IPI). While the stock market variables used in the study is the Kuala Lumpur Composite Index (KLCI)-as a representation of conventional stock market, and Rashid Hussain Berhad Islamic Index (RHBII) as the representation of Islamic stock market. The data used is started from January 1992 to December 2000 and the method used is the Vector Auto-regression (VAR).

In these studies found that the existing monetary policy variable has an effect on the movement of stock market both conventional and Islamic. And from the regression results indicated that the exchange rate and interest rates have a significant impact on the conventional stock market movements. However the interesting part of the study is that the interest rate does not significantly influence on the movement of Islamic stock market. This is consistent with the existing theory that the interest rates are not a significant variable in explaining the sharia stock

market movements. The result of regression analysis also revealed that monetary policy can predict the conventional stock market from 22 to 29%. However, monetary policy can only predict the movement of sharia stock prices by 15-26%. This showed that a Muslim investor not just thinking to improve the profitability, but also think about Shariah compliance (Yusof and Majid, 2007).

Schmitt (1997) tested if economic fluctuations can be transmitted internationally. He specifically focused the effects of U.S business cycle on the Canadian economy. The paper argued that for a wide class of international real-business cycle models like imperfect competition, their traditional channels of international transmission of business cycle through world interest rate and terms of trade variations do not any more explain the cyclical response of the Canadian economy to innovation in U.S output. However this contra to amore empirical studies that found the cyclical variations in output and other macroeconomic aggregates are positively correlated across countries.

The fiscal policy reactions are criticized for limiting the government to react to business cycle fluctuations. Fatas and Mihov (2004) viewed the adoption of quantitative restrictions as inevitability leading to increase macroeconomic volatility. The results stated that strict budgetary restrictions are inevitably leading to lover policy volatility and fiscal restrictions reduce the responsiveness of fiscal policy to output. Meaning that, these two policies do have apposite effects on output volatility. Less restriction reduces volatility; less responsiveness of fiscal policy may amplify business cycles. Restrictions by reducing discretion in fiscal policy can reduce macroeconomic volatility.

Kose et al. (2008), made a comprehensive evaluation of the degree of global cyclical interdependence. The period covered 1960- 2005 with 106 countries grouped into industrial countries, emerging markets and other developing countries. The paper found that global factors become less important for macroeconomic fluctuations during globalization period (1985-2005) relative to pre-globalization period (1960-1984). This implies that trade and financial integration are not associated with global convergence of business cycle as evidenced in this paper by the decline in the importance of global factors but rather specific factors for each countries do have influence significantly business cycle.

Christopher Bajada (2001) has done the research about the Effects of Inflation and the Business Cycle on Revision of Macroeconomic Data. This paper provides the first known examination of these effects and to identify an optimal strategy to ensure the highest quality of data collection by using the growth rate of two measures of output (The expenditure measures: GDP (E) and the income measure: GDP (I). The author postulated that during economic expansions and inflationary pressure, preliminary estimates GDP are more unreliable predictors of the final estimates and the quality of preliminary economic data is upward biased. Moreover, It also appears that there is greater effect on the expenditure measure of economic activity than on the income measure from changes in the rate of inflation and the business cycle, which may justify the preference for GDP(I) as more accurate indicator of economic activity, however GDP(I) too is affected by the extent of inflation and the stage of the business cycle. Then, the optimal strategy for the government should support a policy of low inflationary economic growth with an inflation target of roughly imagined between 0 and 5%

Bryan W. Roberts (2009) evaluates the macroeconomic impacts of the 9/11 attack on U.S. real GDP by observing the impact of GDP growth and unemployment rate by examining how forecasts of these variables were revised after the attack occurred. The research suggests that after the terrorist attacks on 9/11 have a significant negative impact on real GDP growth and unemployment rate. The real GDP was reduced by 0.5% and increased the unemployment rate by 0.11% (reduce employment by 598,000 job) in 2001

Vergos et al. (2010) have done the empirical research about the affected of macroeconomic factors on business Cycles in the United state economy between 1950 – 2009. The research have found that in terms of aggregate demand factors it is investigated which

are the effect of Personal consumption expenditures, Government consumption expenditures, Gross private domestic investment and Interest rates to both GDP growth and the duration of crises. The results indicate that demand-side variables are the main explanation of US GDP.

In particular, it was found that the change in government consumption expenditures is by the far the most important factor that affects positively GDP growth, whilst a mix of interest rate decrease and increase in personal consumption expenditures may be an effective tool to shorten the duration of crises. It is also found that the effect of fiscal policy is smaller after 1950, maybe due to increasing globalization. Finally, findings show that policies that favor consumption of durables may not have a long-run effect of GDP growth, while (tax or other) policies that maintain or enhance the consumption of non-durables may be more meaningful.

Findings are interesting for policy makers and may add a further insight into the possible mix of policy that could be followed by regulatory authorities and governments for both the boost of economy and the resolution of crises. Overall, the empirical findings of this study indicate that the role of private investments for GDP growth may be over-rated among policy makers, given the low contribution of this factor to GDP growth, even after adjusting for different time periods. This implies that Keynesian practices may be more effective than initially thought. On the contrary, policies aiming at increasing the role of the state may lead to higher GDP growth and shorter economic crises. In line with other studies, it was found that interest rate policy affects the duration of economic cycles, hence without effect on long-term growth.

Satoshi Urasawa (2008) examines the characteristics of the business cycle fluctuations based on the 50 quarterly macroeconomic time series in 1980-2000 periods. The independent variables consist six categories: GDP components, aggregate employment, wages, deflators and prices, interest rates and stock price, and money and exchange rate. The authors use the classic statistic methods: standard deviation, auto-correlation and cross-correlation of the cyclical component of each series. Among the most interesting finding are that non-scheduled hours worked plays a key role as a buffer for labor inputs. Distinctively, because of the behavior of non-scheduled cash earnings and bonuses, wages in Japan are very sensitive to changes in the level of economic activity. Also significant, the relationship between money and output has changed dramatically after the collapse of the bubble economy in 1991

Marco, Mauro and Polasek (2004) examines business cycle characteristics of Mediterranean countries using a set of macroeconomic aggregates (GDP and demand components, money, and prices) for fifteen Mediterranean countries over the 1960-2000 period. The researchers analyze the main properties of business cycle fluctuations (persistence, volatility, asymmetry, and synchronization) and suggest that there are various regularities in the characteristics of business cycles of countries that are similar in their stage of development and/or geographical contiguity.

Moreover, the authors investigate if co-movements in aggregate time series are robust; that is, if they are common to various countries belonging to different economic levels of development, but that are geographically contiguous and with economic and historical linkages. We find similarities in terms of co-movements and periodicity with respect to the GDP for consumption and investment among the aggregate demand components and, to a lesser degree, the price level and the inflation rate. On the other hand, differences among developed and developing countries of the Mediterranean region emerge, as both trade balance and policy variables are pro-cyclical in many developing countries. Such findings may reflect the characteristics of policy making in developing countries and those countries' dependence on world demand in international trade

Also, in the conclusion of this chapter, Fama (1981) documents a strong positive correlation between common stock returns and real economic variables like capital expenditures, industrial production, real GNP, money supply, lagged inflation and interest rates. Chen, Roll and Ross (1986) find that the changes in aggregate production, inflation, the short-

term interest rates, the maturity risk-premium and default risk premium are the economic factors that explain the changes in stock prices. The relationship between stock prices and interest rates has received considerable attention in the literature. According to Asprem (1989), Fama (1990), Bulmash and Trivoli (1991) show that there is a negative relationship between interest rates and stock returns in Korea. Zordan(2005) found historical evidence illustrates that stock prices and interest rates are inversely correlated. Omran (2003) who focused on examining the impact of real interest rates as a key factor in the performance of the Egyptian stock market found a significant long-run and short-run relationship between the variables, implying that real interest rates had an impact upon stock market performance. Uddin and Alam (2007) found that Interest Rate has significant negative relationship with Share Price and Changes of Interest Rate has significant negative relationship with Changes of Share Price. For decades, it was generally believed that inflation and stock returns exhibited a negative correlation.

However, there are conflicting inferences in the literature about the relationship between inflation and real stock returns. Nelson (1976), Fama and Schwert (1977), and Schwert (1981) report evidence of an inverse relationship between inflation and real stock returns. On the other hand, Boudoukh and Richardson (1993) find strong support for a positive relationship between nominal stock returns and inflation at long horizons while Choudhry (2001) finds that current stock market returns are positively correlated with current inflation in high inflation countries. Rapach (2002) disputes the findings of an inverse relationship between real stock prices and inflation. Using the King and Watson (1997) methodology of testing for long-run neutrality, Rapach (2002) finds no evidence of along-run inverse relationship in a study involving sixteen industrialized countries.

Shiller and Beltratti (1992) find little correlation between inflation and stock returns, but do find an inverse relationship between stock returns and interest rates. Such a relationship is supported by Campbell and Ammer (1993) among others. Authors provide explanations for an inverse relationship between inflation and stock returns in several ways. Fama(1981), Feldstein (1980), Modigliani and Cohn (1979) and Pindyck (1984) are among those researchers who have proposed explanations to the anomalous findings stating negative relationship between inflation and stock returns. More recently, researchers started analyzing this relationship for developing countries. Apergis and Eleftheriou (2002) found that in the high inflation country Greece, stock returns seem to be linked to inflation rather than interest rates. Omran and Pointon (2001) uncovered negative relationship between inflation and stock market activity in Egypt. Mukherjee and Naka (1995) argue that if an increase in money supply leads to economic expansion via increased cash flows, stock prices would benefit from economic growth lead by such expansionary monetary policy. The study shows that money supply is positively related to stock market. Consistently, Maysami and Koh (2000) support the view of Mukherjee and Naka(1995) for both long run and short run dynamic interaction between money supply and stock returns for the case of Singapore.

## **Research Methodology**

### ***Data and sampling***

The data utilized in the analysis has been collected from different sources. for Malaysia, Consumer Price Index (CPI), Exchange Rate (ER), Money Supply (MS), Lending Interest Rate (LR) and Industrial Production (IP) has been collected from Bank Negara Malaysia, while stock price from yahoofinance. The data used is Monthly data covering the period from first January 2007 to June 2010, with sample size of 42 data items.

This study uses Multiple Regression Analysis to show the relationship between Industrial Production (IP) of Malaysia, which is the dependent variable of the study and the selected

independent macroeconomic variables that are: Consumer Price Index (CPI), Exchange Rate (ER), Money Supply (MS), Lending Interest Rate (LR) and stock price.

Industrial Production (IP) is a function of the foreign exchange rate, the level of money supply, the interest rate, the consumer price index and stock price. We restricted the influencing factors to five as representatives of the macroeconomic factors. A simple linear regression model derived from Al-Tamimi (2007) is adopted for the study.

$$IPI = f(ER, MS, LR, CPI, \text{stock price})$$

IP is the dependent variable which will be regressed against the independent variables (ER, MS, LR, CPI, stock price). The outcome of the regression would show how far the independent variables can explain the variation on the dependent variable. A multiple regression software (SPSS) was used to conduct the regression analysis.

In multiple regressions we use, the dependent variable (Industrial production (IP)) denoted as Y, while the independent variables (X1, X2, X3, X4, X5) represented respectively as ER, MS, LR, CPI and stock price represented by KLCI/JCI.

$$Y = \beta_0 + \beta_1 ER + \beta_2 MS + \beta_3 LR + \beta_4 CPI + \beta_5 KLCI / JCI + \epsilon \quad Eq. (1)$$

Where:

$\hat{Y}$  = IP (Industrial production)

ER = Exchange Rate

MS = Money Supply

LR = Lending Interest Rate

CPI = Consumer Price Index (Inflation).

KLCI = Kuala Lumpur Composite Index

$\beta_0$  = intercept ( $\beta_0$  = slope of the dependent variable)

$\beta_i$  = coefficient of the independent variable

$\epsilon$  = error term

To express the previous equation in the form of multiple regression function, we can write it in the following way:

$$\ln \hat{Y} = \alpha + \beta_1 \ln(ER) + \beta_2 \ln(MS) + \beta_3 \ln(LR) + \beta_4 \ln(CPI) + \beta_5 \ln(KLCI) + \epsilon \quad Eq. (2)$$

Lns in the above equation are the initials of natural logarithm. It means data items are converted into natural logarithm because it was in different forms such as rates, index and Malaysian Ringgit, so comparable measurement is achieved and the size of the data items can be similar and interpretable<sup>2</sup>.

## Finding and Discussion

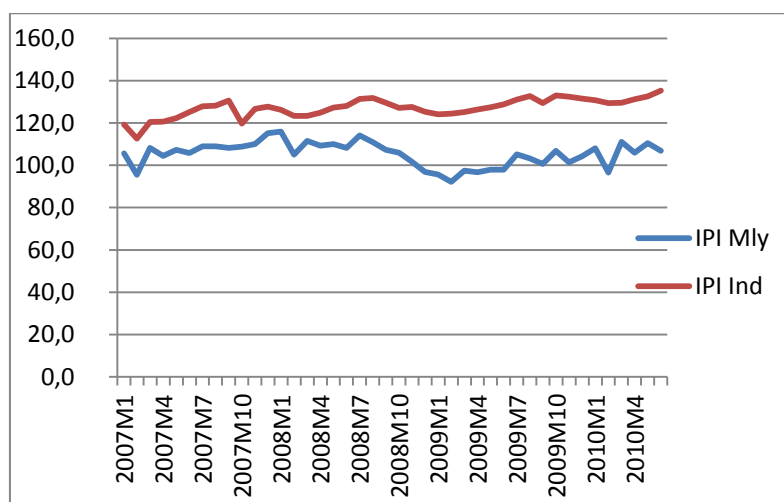
### *Industrial Production Index*

Indonesia and Malaysia are well-known as the agrarian countries that it is can be seen from the agricultural product from both countries. However, the progress of Malaysia industrialization is better than Indonesia case. It signaled by the trend in export- import in manufacturing product. In addition, the good industry with better in investment climate in Malaysia, make Malaysia

<sup>2</sup> Source: [http://en.wikipedia.org/wiki/Data\\_transformation\\_\(statistics\)](http://en.wikipedia.org/wiki/Data_transformation_(statistics))

more attractive than Indonesia<sup>3</sup>. Therefore, when crisis hits in 2008/2009, although GDP growth in Malaysia was negative (-1.7%) in 2009, but this can jump better than Indonesia in 2010, 7.2% for Malaysia GDP growth and 6.4% for Indonesia. In that year Malaysia can quick recover from crisis as Malaysia has good manufacturing and the optimal macroeconomic policy from the government. This condition of course has many implication for both countries especially in the workforce, that Malaysia import many Indonesian worker.

**Graph 1: IPI for Indonesia and Malaysia**



This research use Industrial Production Index as proxy for the business cycle that in many research more familiar with use of GDP. The graph above shows the Industrial production index in Malaysia and Indonesia between 2007 and 2010. From the line graph we can see that from 2007 till 2010, IPI for Indonesia was higher than Malaysia. Industrial production index for Malaysia is range between 90 until 110. However, in Indonesia Industrial production index was around 120-140, with it peaks in June 2010 that IPI count at level 135.

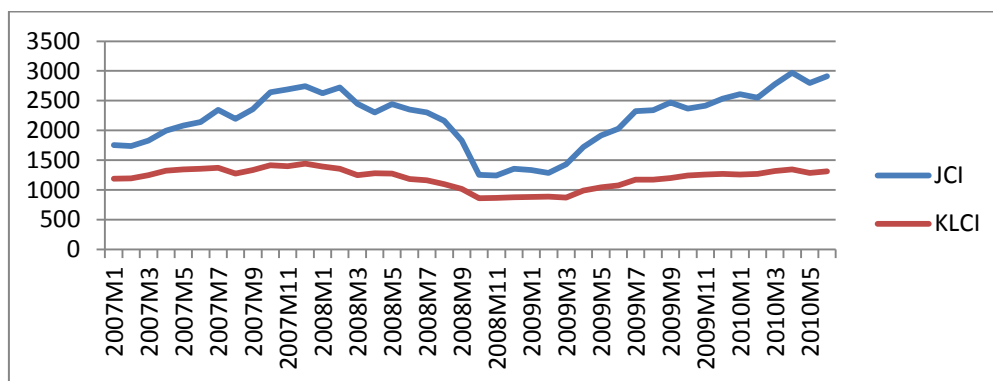
IPI for Malaysia was lower than Indonesia since in that periods, Malaysia face severe crisis than Indonesia. It can be compared with the GDP growth that Malaysia negative and Indonesia still positive. It is also illustrated by the IPI for Indonesia which more stable, while Malaysia's IPI was fluctuate in every month since 2007 till 2010.

### ***Stock Price and Exchange Rate***

Business cycle that in this research use Industrial Production Index is affected by many factors, especially macroeconomics condition includes capital, exchange rate, inflation etc. The performance of business cycle between 2007 and 2010 is has same pattern with the increasing capital, particularly in capital market. Table below describes the fluctuation of capital market in Malaysia (KLCI) and Indonesia (JCI). Started from January 2007, JCI increased gradually from around 1757 in year 2007, reach 2,745 in the last year 2007. However, this capital index fluctuate since 2008 when financial crisis hit, but count at highest level in June 2010 that the JCI state at the peak around 2,913. In Malaysia capital market, the trend is same with Indonesia, which in 2007 JCI was increase and corrected again in the last 2008, that KLCI at lowest level around 860.

<sup>3</sup> See in Doing Business Report, 2011 that shows Malaysia has better ranking than Indonesia. Although Indonesia are below Malaysia, but the trend of Indonesia is increase in that ranking, from the lowest group in 2000 to middle class group currently.



**Graph 2: Fluctuation KLCI and JCI**

The performance of KLCI and JCI between 2007 and 2010 were not merely affected by the fundamental of macroeconomic. Some economist said that the fluctuation of Market Index (KLCI and JCI) caused by the policy of the Fed, related to the expansionary policy with increase money supply, well known by quantitative easing. There is difficult justification for saying that Capital market has significant impact on the performance of industries (proxied by IPI). However, if we analyze from the trend of IPI and Capital market, both of Malaysia IPI and Indonesia has similar pattern with the capital market.

We can conclude that, first, the performance of KLCI and JCI was reflecting that the fundamental of industries performance in Malaysia and Indonesia was good. Therefore, Investors are confidence with the performance of industries. Second, when the investor was confidence with industry performance, capital funding can be accessed easier. For raising capital, industry can issue bond or stock, that in good market performance, investor will buy all securities issued by industry<sup>4</sup>.

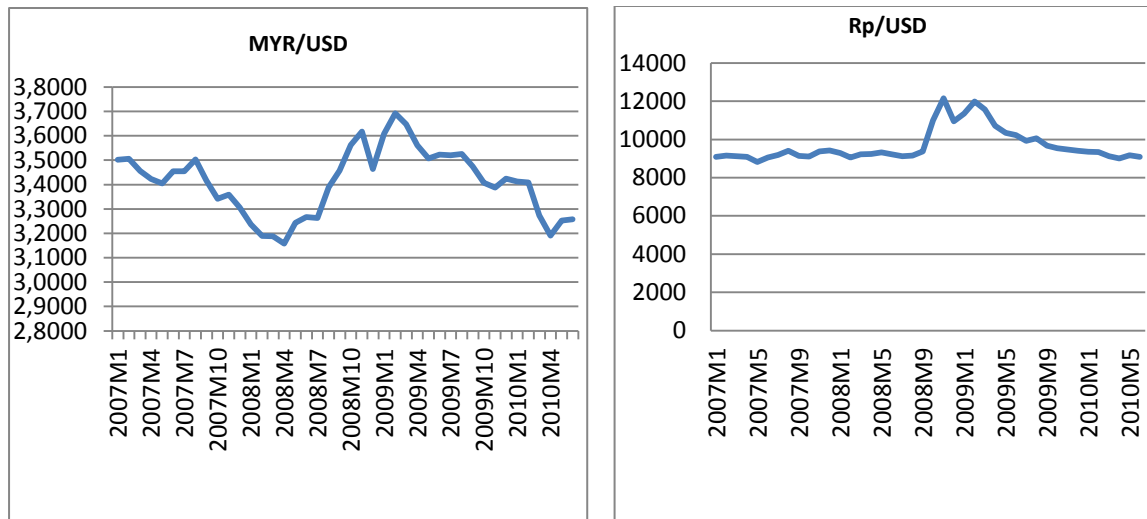
In addition, the trend of business cycle also caused by the exchange rate, especially for country that the manufacturing operations are export oriented. Exchange rate has significant implication for the export, since the price of good from domestic are competitive than good in abroad. Therefore, export will increase, and company will increase output and finally the economy will growth.

The table 4.3 shows the exchange rate of Malaysia ringgit/ USD and Indonesia Rupiah/ USD. From the table above we also see that the trend of exchange rate (Rupiah/ USD) was more stable than the Malaysia Ringgit (MYR/USD). In the last 2008, between Malaysia and Indonesia and Malaysia face different situation that in that time MYR is appreciated, whereas Indonesia rupiah was depreciated. Rupiah Increase from Rp.9,090/ USD in 2007 to around Rp11,000/USD in 2009. However, after 2009, Rupiah currency appreciated to USD<sup>5</sup>. Macroeconomic theory said that, to make the domestic good competitive with the product from

<sup>5</sup> The appreciation of Rupiah was caused by the increasing of capital inflows from abroad to Indonesia especially in portfolio investment, i.e in stock and government bond. It is impact of the Quantitative Easing (QE) 1 and 2 in the US.

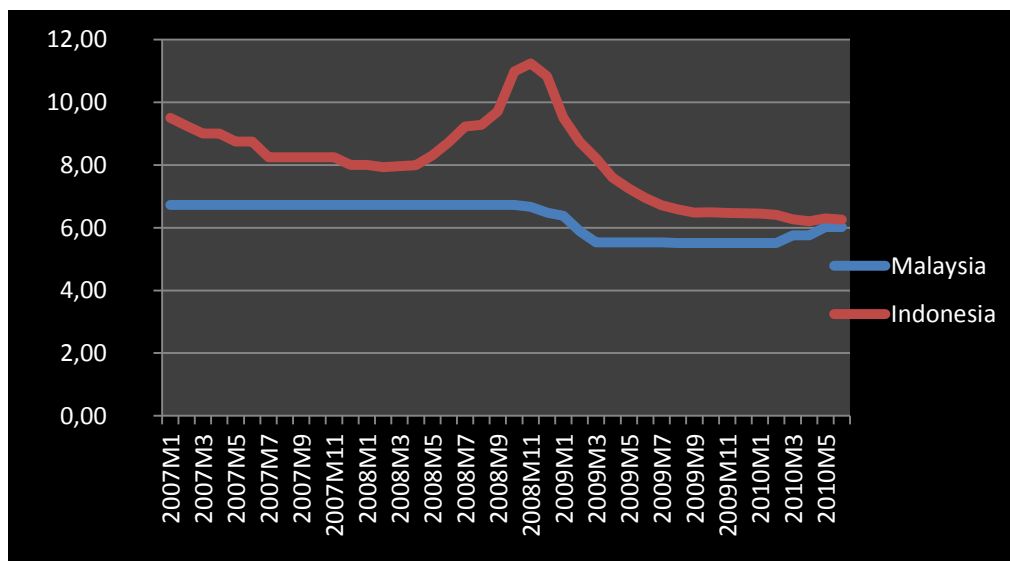
abroad, exchange rate have to decrease. It means that when rupiah currency (Rp) depreciates, there is more export from Indonesia to abroad, since the good from Indonesia is cheap for the foreign. From the graph, we can also see that Rupiah currency appreciate when the Jakarta Composite Index (JCI) increase. It means that in the last 2009 there are many capital inflows from abroad to Indonesia.

**Graph 3:**  
**Exchange Rate of Malaysia and Indonesia**



In Malaysia, exchange rate also fluctuated like in Indonesia. Ringgit currency (MYR) appreciated from MYR 3.5/USD in January 2007 to around 3.28 in April 2008. However, after that Ringgit currency depreciates again 2009, that counted at lowest level MYR 3.69/USD in February 2009. In 2010, Ringgit appreciated again to USD, as same as Indonesia rupiah, that caused by the many capital inflows from the US Quantitative Easing policy.

**Figure 4: BLR of Malaysia and Indonesia**



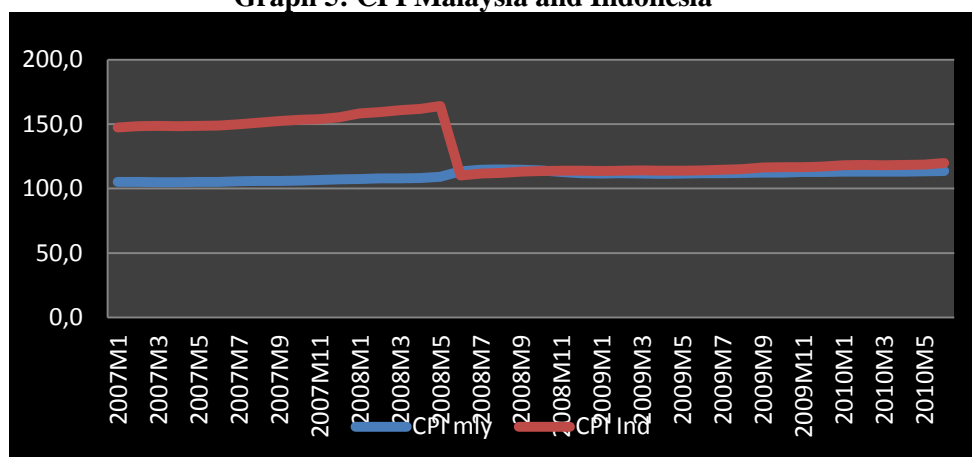
Theoretically, interest rate is also the important factor for the business cycle. The line graph describes the base lending rate in Malaysia and Indonesia between 2007 and 2010. In 2007 the Indonesia BLR was quite high that about 9.5% compared to Malaysia BLR at only 6%. However, the BLR then increased in the last 2008, when the global financial crisis that Indonesia BLR more than 10%. However, after that time the BLR of Indonesia was decreased until 2010, that only 6.26% same as the Malaysia BLR.

In the context of business, we can analyze from two main perspectives the impact of BLR. First, Increase or decrease BLR will cause the business activities. When the BLR decrease, money supply will increase and investment are increasing. Therefore in this point, the business activity will increase. This situation can be seen from the Industrial Production Index (IPI) both Malaysia and Indonesia. We can see that when the BLR was increase, the IPI was decrease since the cost of fund is expensive (in investment context). In addition, when BLR was increased people are more interesting to save than to invest, and this not good for the business activities.

### **Consumer Price Index (CPI)**

Inflation also has impact to the business cycle, include in product pricing, determining the cost and revenue and also collecting profit. When inflation is fluctuates, the business face uncertainty and high risk in investment. Therefore, investors are afraid to invest in the industry sector, and they are commonly changes their investment to the portfolio in capital market.

**Graph 5: CPI Malaysia and Indonesia**

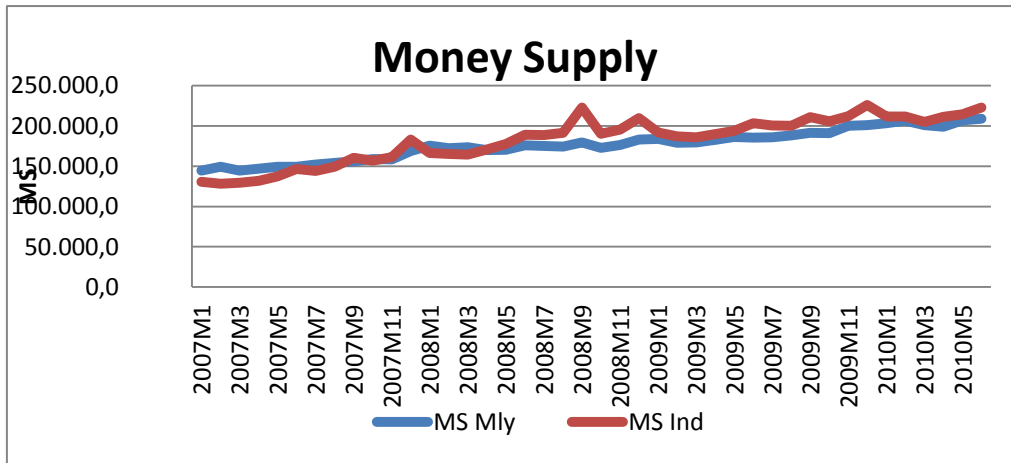


The above table shows about inflation in Indonesia and Malaysia from 2007 and 2010. In 2007 Indonesia CPI is very high that around 145 in 2007 and reach peak at 2008, at 160. However, CPI was decrease in the end of 2008 and quite stable until 2010 that around 117. Whereas, Malaysia CPI was better than Indonesia, since the consumer price index in Malaysia was quite stable. It means that in many this context, Malaysia has better business environment than Indonesia. Certainty can be got in Malaysia as the CPI is better.

### **Money Supply (MS)**

Money supply is also important factor that determine the business cycle. Money supply reflects the government policy in the certain period, which maybe expansionary policy and also contractionary policy.

**Graph 6: Money Supply in Indonesia and Malaysia**



From the line chart above, money supply in Malaysia and Indonesia was increase from 2007 to 2010. When the money supply is increase in economy, generally base lending rate will decrease. Therefore, investment will increase and business cycle will be better.

**Quantitative Analysis**

This study compares the macroeconomic variables that effect the industrial production of Malaysia and Indonesia.

**Results of Malaysia**

The model that we are going to test is based on the model that we have discussed in the methodology, the model is written as follows:

$$Y = \beta_0 + \beta_1 ER + \beta_2 MS + \beta_3 LR + \beta_4 CPI + \beta_5 KLCI + \epsilon \quad Eq. (1)$$

Based on the above model than we run regression analysis using SPSS 17.0 and we obtained result as describe in the Table.

**Table 1: Model Summary**

Mode	R	R Square	Adjusted Square	R	Std. Error of the Estimate	Durbin-Watson
1	.843 <sup>a</sup>	.711	.671		.03212	2.779

a. Predictors: (Constant), Stock Price, Lending Interest Rate, Consumer Price Index, Exchange Rate, Money Supply  
b. Dependent Variable: Industrial Production

The valid model of regression is the model which is free from classic assumption problem. Hence, before we decide that above model is valid, we have to test whether the model complies with the classic assumptions of the regression. Multicollinearity testi will be conducted by employing Variance Inflationary Factor (VIF). In the last column of the table 2 we provide VIF value of each independent variable. There are three variables that indicate multicollinearity problem, which are MS (11.392), IR (5.343) and CPI (6.783). The variable that

has VIF greater than 5 is considered unsatisfactory, indicating that the model should be revised by removing the independent variables that have the multicollinearity problem from the analysis. In this case we will remove variable which has the highest VIF value.

**Table 2: Coefficients (a)**

Model	Unstandardized Coefficients		Standardized Coefficients Beta	T	Sig.	Correlations			Collinearity Statistics	
	B	Std. Error				Zero-order	Partial	Part	Tolerance	VIF
(Constant)	-1.328	2.301		-.577	.567					
Money Supply Exchange Rate	-.181	.158	-.346	-1.144	.260	-.187	-.187	-.102	.088	11.392
Lending Interest Rate	-.217	.279	-.154	-.779	.441	-.691	-.129	-.070	.205	4.889
Consumer Price Index	.281	.130	.448	2.163	.037	.473	.339	.194	.187	5.343
Stock Price	1.277	.420	.710	3.042	.004	-.195	.452	.273	.147	6.783
	.270	.069	.733	3.937	.000	.636	.549	.353	.232	4.315

a. Dependent Variable: Industrial Production

Based on the above result, the model has been revised two times for multicollinearity problem:

1. First: three variables were having problems, which are MS (11.392), IR (5.343) and CPI (6.783). The variable which has the highest VIF value will be removed, here MS has the highest value but it is one of the main factors of economic liquidity management so that we cannot remove it. Therefore, the next highest which is Consumer Price Index (CPI).
2. Second: two variables, which are MS (5.589) and IR (5.110), were having multicollinearity problem. Yet MS has the highest value but for the above mentioned reason IR will be removed from the analysis.

After the above revision we got new model as follows;

$$Y = \beta_0 + \beta_1 ER + \beta_2 LR + \beta_3 KLCI + \epsilon \quad Eq (2)$$

Based on the model in Equation 2, we run regression analysis using SPSS 17.0 to check if still multicollinearity problem were there and obtained result as described in the Table 3.

**Table 3: Regression Result Coefficients**

Model		Unstandardized Coefficients		Standardized Coefficients Beta	T	Sig.	Collinearity Statistics	
		B	Std. Error				Tolerance	VIF
1	(Constant)	4.135	.577		7.165	.000		
	Exchange Rate	-.546	.198	-.388	-2.760	.009	.506	1.975
	Lending Interest Rate	.198	.065	.316	3.040	.004	.927	1.079
	Stock Price	.117	.051	.317	2.309	.026	.531	1.885

VIF column in Table 3 indicate that no variables have VIF value greater than 5, indicating that the independent variables in this model are free from multicollinearity problem.

**Table 4: Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.787 <sup>a</sup>	.619	.589	.03588	2.159

a. Predictors: (Constant), Stock Price, Lending Interest Rate, Exchange Rate  
 b. Dependent Variable: Industrial Production

The table 4.4 above we report the proportion of total variation of IPI explained by all independent variable in the model. The overall goodness of fit of the model is measured by the coefficient of multiple determinations, R2. Table regression output above reported that R2 is 0.619, which implies that 61.9% of the variation in Industrial Production is explained by the variation in independent variable namely stock price, Interest rate, and exchange rate.

**Table 5: ANOVA**

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	.080	3	.027	20.618	.000 <sup>a</sup>
	Residual	.049	38	.001		
	Total	.129	41			

a. Predictors: (Constant), Stock Price, Lending Interest Rate, Exchange Rate  
 b. Dependent Variable: Industrial Production

A statistical hypothesis test for the existence of a linear relationship between Industrial Production and any of the independent variables is:

$$H_0: \beta_1 = \beta_2 = \beta_3 = \beta_4 = 0$$

Ha: Not all the  $\beta_i$  are zero

Decision rule: If p value is less than the level of significance (5%), we reject H0, otherwise accept H0. From the regression table we found that p value is 0.000, which is less than 5% the level of significance. Hence, we reject H0 and conclude that at least one of the independent variables is significant predictor of industrial Production.

***Test of Individual variables & Interpretation of Results***

To test the significance of the individual independent variables ,we compare the level of significance and p value. Decision rule: if p value is less than the level of significance (5%) reject H0, otherwise do not reject H0. The p values are Exchange Rate (0.009), Lending Interest Rate (0.004), and Stock Price (0.026), these values are all less than the level of significance 5%, we therefore, reject the Null hypothesis.

Looking into the coefficients of the significant variables, we can see that interest rate and stock price have positive effect on the Industrial production. Holding other variables constant, a unit increase in interest rate will increase Industrial production by 0.316 points as well as stock price by 0.317 point. This finding is in line with work of Ibrahim and Wan Yussuf (2001) who found that the association between the stock price and the industrial production is positive and added that this should be expected as the changes in the stock price reflect expectations of future economic conditions and the current changes in the industrial production may influence the firms’ expected future cash flows. Similarly, Duca (2003) found that stock price and GDP go together and justified his argument that increase in stock price is increase of wealth of holder of the stock and this means increase in income. If the income increases, people’s consumption will increase also, so this causes that output also to be increased. As a result of this the GDP has a positive relationship with stock price

**Table 6: Coefficients**

Model		Unstandardized Coefficients		Standardized Coefficients Beta	T	Sig.	Correlations			Collinearity Statistics	
		B	Std. Error				Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	4.135	.577		7.165	.000					
	Exchange Rate	-.546	.198	-.388	-	.009	-.691	-.409	-	.506	1.975
	Lending Interest Rate	.198	.065	.316	2.760	.004	.473	.442	.304	.276	1.079
	Stock Price	.117	.051	.317	3.040	.026	.636	.351	.231	.531	1.885

a. Dependent Variable: Industrial Production

On the other hand exchange rate has negative impact on Industrial production. Holding other variables constant, a unit increase in exchange rate will decrease Industrial production by -0.388 points, meaning that one unit of exchange rate depreciation will decrease the industrial production an amount equal to the coefficient of the exchange rate. The results of Ibrahim and Wan Yussuf (2001) showed that currency depreciation can be either negative or positive. Ibrahim and Wan Yussuf (2001) said, “For an economy that is highly dependent on imports, currency depreciation raises input prices and reduces firms’ profit margin. Moreover, currency depreciation may generate expectations of future depreciation and, subsequently, drive portfolio investments out of the country. By contrast, it may be argued that currency depreciation encourages exports and, thus, firms’ profits. The net effects, accordingly, will depend on which force is more dominant”. The work of Kassim and Abdulmanap (2007) also supports this explanation, as they point out in their results that exchange rate depreciation makes exports more competitive and imports more expensive and added that this would by convention improve trade balance and increase aggregate demand and interest rate, then central bank purchases foreign exchange to increase domestic Money supply and consequently real depreciation is effective. They further point out that following the depreciation, output will contract immediately as price increases due to the double impact of an increased demand and import prices.

### Results of Indonesia

The model that we are going to test is based on the model that we have discussed in the methodology, the model is written as follows:

$$Y = \beta_0 + \beta_1 ER + \beta_2 MS + \beta_3 LR + \beta_4 CPI + \beta_5 JCI + \epsilon \quad Eq. (1)$$

Based on the above model than we run regression analysis using SPSS 17.0 and we obtained result as describe in the Table1.

**Table 7: Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.847 <sup>a</sup>	.718	.679	.02042	1.757

a. Predictors: (Constant), Stock Price, Money Supply , Lending Interest Rate, Consumer Price Index, Exchange Rate

b. Dependent Variable: Industrial Production

The valid model of regression is the model which is free from classic assumption problem. Hence, before we decide that above model is valid, we have to test whether the model complies with the classic assumptions of the regression.

**Table 8: Coefficients (a)**

Model		Unstandardized Coefficients		Standardized Coefficients Beta	T	Sig.	Collinearity Statistics	
		B	Std. Error				Tolerance	VIF
1	(Constant)	2.298	1.009		2.278	.029		
	MoneySupply	.104	.045	.477	2.305	.027	.183	5.475
	Exchange Rate	.085	.098	.198	.872	.389	.152	6.578
	Lending Interest Rate	.039	.037	.184	1.059	.297	.261	3.831
	Consumer Price Index	-.078	.048	-.316	-1.633	.111	.210	4.771
	Stock Price	.105	.047	.717	2.260	.030	.078	12.837

To detect multicollinearity we use Variance Inflationary Factor (VIF). As clear in the last column of the table 2, there are three independent variables which indicate multicollinearity problem that are MS (5.475), ER (6.578) and Stock Price (12.837). These variables have VIF greater than 5 which is considered unsatisfactory, indicating that the model should be revised by removing the independent variables that have the multicollinearity problem from the analysis. The variable which has the highest VIF value will be removed, which is Stock Price in our case.

According to the above test result, the model has been revised two times for multicollinearity problem:

1. First: three variables, which are MS (5.475), ER (6.578) and Stock Price (12.837), were having multicollinearity problem. Here Stock Price has the highest value, so it has been removed from the analysis.
2. Second: there are no multicollinearity problem three variables that are exchange rate, interest rate and consumer price were insignificant. Consumer price had the highest percentage so we removed it.
3. Third: one variable which is interest rate became insignificant and has been removed from the analysis

After the above revision we got new model as follows;

$$Y = \beta_0 + \beta_1 ER + \beta_2 MS + \epsilon \quad Eq. (2)$$

Based on the model in Equation 2, we have regressed the variables again using SPSS 17.0 to check if multicollinearity problem were there still and obtained result as described in the Table 3.

**Table 9: Regression Result Coefficients**

Model		Unstandardized Coefficients		Standardized Coefficients Beta	T	Sig.	Correlations			Collinearity Statistics	
		B	Std. Error				Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	3.660	.386		9.483	.000					
	MoneySupply	.188	.021	.865	8.939	.000	.777	.820	.820	.899	1.113
	Exchange Rate	-.119	.042	-.276	-2.855	.007	-.001	-.416	-.262	.899	1.113

a. Dependent Variable: Industrial Production



VIF column in the above Table indicates that model is now free from multicollinearity problem since there is no variable having VIF value greater than 5.

**Table 10: Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.820 <sup>a</sup>	.672	.655	.02115	1.639

a. Predictors: (Constant), Exchange Rate, Money Supply  
b. Dependent Variable: Industrial Production

The proportion of total variation of Industrial Production explained by all independent variable in the model is a measure of the overall goodness of the model. This proportion is measured by the coefficient of multiple determinations (R<sup>2</sup>). Regression output in the above Table reported that R<sup>2</sup> is 0.672 which implies that 67.2% of the variation in the Industrial Production is explained by the independent variables.

**Table 11: ANOVA**

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	.036	2	.018	39.955	.000 <sup>a</sup>
	Residual	.017	39	.000		
	Total	.053	41			

a. Predictors: (Constant), Exchange Rate, Money Supply  
b. Dependent Variable: Industrial Production

We tested the hypothesis to check the existence of a linear relationship between industrial production and any of the independent variables as under:

$$H_0: \beta_1 = \beta_2 = \beta_3 = \beta_4 = 0$$

Ha: Not all the  $\beta_i$  are zero

Decision rule: If P value is less than the level of significance (5%) reject H<sub>0</sub>, otherwise accept H<sub>0</sub>. From the regression table we found that p value 0.000 which is less than the level of significance (5%), therefore, we reject H<sub>0</sub> at 95% level of confidence and conclude that at least one of the independent variables is significant predictor of IPI.

**Table 12: Coefficients**

Model	Unstandardized Coefficients		Standardized Coefficients Beta	T	Sig.	Correlations			Collinearity Statistics	
	B	Std. Error				Zero-order	Partia l	Part	Toleranc e	VIF
(Constant)	3.660	.386		9.483	.000					
MoneySupply	.188	.021	.865	8.939	.000	.777	.820	.820	.899	1.113
Exchange Rate	-.119	.042	-.276	-2.855	.007	-.001	-.416	-	.899	1.113

a. Dependent Variable: Industrial Production

To test the significance of the individual independent variables, we use the level of significance and the p value. Decision rule: if the p value is less than the level of significance. As in the above table the p values of Money supply and exchange rate are 0.000 and 0.007 respectively. Thus we reject H<sub>0</sub> at 95% level of confidence and conclude that both Money supply and exchange rate significantly explain the variation in the Industrial production.

### Comparison and Discussion

This study tested selected macroeconomic variable that believed to have effect on Industrial production of both Malaysia and Indonesia. The selected variables were: IP, CPI, ER, MS, IR and stock prices but only the variables in the below table were safe from classical assumption problems especially multicollinearity.

**Table 13: Comparison of Results**

Variable	Malaysia (coefficients)	Indonesia (coefficients)
Money Supply (MS)	Dropped	0.865
Interest Rate (IR)	0.316	dropped
Exchange Rate (ER)	-0.388. 0.276	-0.276
Stock Price	0.317	dropped
Consumer Price Index (CPI)	Dropped	dropped
R-Square	0.619	0.672
F-Test	Significant	significant

In general, the two countries share the exchange rate as a variable that has impact on Industrial production. However, the two countries differ in Money Supply, Interest rate and stock price. Malaysian industrial production is affected by Interest rate and stock price in addition to exchange rate which the two countries share, while Indonesian Industrial production is affected by Money supply in addition to exchange rate. The differences are due to differences in the monetary policy targets pursued by the two countries.

In Indonesia, the monetary policy is conducted by Bank Indonesia (BI). Along the way, Bank Indonesia, which is the monetary authority of Indonesia, has undergone many changes within the framework and the final goal of monetary policy. But, after the publication of act no. 3 year 2004, Bank Indonesia has one ultimate goal of monetary policy: achieving and maintaining the stability of Rupiah. It is stated in article 7 of act no. 3 year 2004. The meaning of stability in the rupiah here is the stability of prices of goods and services reflected in inflation.

To achieve that final target, since July 2005, BI are formally applying monetary policy framework with inflation as the main target of monetary policy (Inflation Targeting Framework) and adopting a floating exchange rate system (free floating) as the statement of bank of Indonesia: *“To implement monetary policy, Bank Indonesia has opted for a working framework known as the Inflation Targeting Framework (ITF). This framework was formally adopted in July 2005, and replaces the previous monetary policy using base money as the monetary policy target”*<sup>6</sup>.

In addition, Bank Indonesia also run exchange rate policy to control exchange rate stability which is very crucial role in price stability and financial system. BI Exchange rate policy aims to reduce excessive exchange rate volatility, not to direct the exchange rate at a certain level.

In order to achieve the final goal as discussed previously, the central bank set the BI rate as the main policy instrument to influence economic activity with the ultimate goal is the achievement of inflation. In the mechanism, BI has several lines or transmission started from the changes in the BI rate until affect the inflation which is the ultimate goal of monetary policy. That mechanism is often referred to as the transmission mechanism of monetary policy.

This mechanism describes the BI action through changes in monetary instruments and operating targets affecting various economic and financial variables before ultimately affect the

<sup>6</sup> <http://www.bi.go.id/web/en/Moneter/Kerangka+Kebijakan+Moneter/>

final destination, inflation. The mechanism occurs through the interaction between the central bank, banking and finance sector, and the real sector. The paths of BI Rate are the interest rate, credit line, track the exchange rate, asset price point, and the expectations channel. And finally, *the Inflation Targeting Framework (ITF)* policy generally will offset inflation and interest rate effects on the economy because both of inflation (CPI) and interest rate (IR) already have controlled by government, hence there is no significant effect of CPI and IR on the volatility of gross domestic product (IPI).

On the other hand Malaysia targets interest rate which has its implication on the Money supply. Froyen and Low (2001), explaining the implications of interest rate targeting on Money supply, said *“carrying out open market purchases or sales, the central bank authority increase or decreases bank reserves, bank deposits and therefore, the money stock”*. However, the variables have significant impact on industrial production as indicated by the overall significance of the variables that are tested as well as the higher correlation explained by the R-square of 61.9% and 67.2% respectively. However, not all the variables in the table are significantly effecting Industrial production, after checking the significance of the individual variable we got that money supply was insignificant in the case of Malaysia but in the case of Indonesia stock prices and interest rates insignificant.

The results of the study show that ER has negative significant effect to the IPI by -0.388 and -0.276 respectively, for Malaysia and Indonesia. It means that one unit of ER appreciates will decrease the IPI an amount equal to the coefficient of the ER which is 0.388 points for Malaysia and 0.276 points for Indonesia. This research finding is in line with the study of Ibrahim and Wan Yusof (2001) who found that currency depreciation can be either negative or positive. They said, *“For an economy that is highly dependent on imports, currency depreciation raises input prices and reduces firms’ profit margin. Moreover, currency depreciation may generate expectations of future depreciation and, subsequently, drive portfolio investments out of the country. By contrast, it may be argued that currency depreciation encourages exports and, thus, firms’ profits. The net effects, accordingly, will depend on which force is more dominant”* Moreover, according to Joey Chew, Sam Ouliaris, and Siang Meng Tan (2011), exchange rate (ER) will give higher significant impact on the economy of small openness trade country such as Singapore. They have approved that the ER provides an effective tool to moderate imported inflation in Singapore. The Importers have been passing on a smaller share of ER movements during boom periods as compared to recessions.

Looking into the coefficients of the significant variables, for Indonesia’s perspective, we can see that money supply (MS) has positive effect on the Industrial production but not for Malaysia’s business cycle. Holding other variables are constant, a unit increase in MS in Indonesia will increase Industrial production by 0.865 points. This result supports the research have been conducted by Kassim and Abdulmanap (2007) as they pointed out in their results that exchange rate depreciation makes exports more competitive and imports more expensive and added that this would by convention improve trade balance and increase aggregate demand and interest rate, then central bank purchases foreign exchange to increase domestic Money supply (MS) and consequently real depreciation is effective. They further point out that following the depreciation, output will contract immediately as price increases due to the double impact of an increased demand and import prices.

On the other hand, the statistical results revealed that for Malaysia’s point of view, interest rate (IE) and stock price have positive effect on the Industrial production (IPI) and the other way around for Indonesia’s business cycle. Holding other variables constant, in Malaysia, a unit increase in IR will increase IPI by 0.316 points as well as stock price by 0.317 point. This is in line with the findings of Ibrahim and Wan Yusof (2001) who explained that the association between the stock price and the IPI is positive and added that this should be expected as the changes in the stock price reflect expectations of future economic conditions and the current changes in the IPI may influence the firms’ expected future cash flows. Similarly, Duca (2003)

found that stock price and GDP go together and justified his argument that increase in stock price is increase of wealth of holder of the stock and this means increase in income. If the income increases, people's consumption will increase also, so this causes that output also to be increased. As a result of this the GDP has a positive relationship with stock price.

### **Conclusions and Recommendation.**

This paper examines the macroeconomic fluctuations and economic growth in Malaysia and Indonesia by using multiple regression models. To achieve the objective of the study five variables were chosen for the model. These variables are Money supply (MS), Industrial production (IP), Interest rate (IR), exchange rate (ER), Consumer price Index (CPI) and stock prices.

In general, the study shows that Money supply (MS), Interest rate (IR), exchange rate (ER), and stock prices are among others, the determinant factors of macroeconomic fluctuations in both countries. Specifically, the empirical results reveal that Interest rate (IR), exchange rate (ER), and stock prices make significant contribution to the performance of real GDP in Malaysia while Money supply (MS) and exchange rate (ER) are the main cause of macroeconomic fluctuations in Indonesia. This may be due to the different monetary policies pursued by the two countries. The two countries might have different monetary policy strategies; Malaysia pursues interest rate targeting policy, whereas Indonesia applies inflation rate targeting policy.

The choice of either of these policies depends upon the source of the problem faced by the policy makers. Therefore, if the source of problem is political pressure, the inflation rate targeting is preferred to reduce the political pressure on the central banks. On the other hand, interest is seen to be superior when uncertainty originates from shifts in the level of money supply due to unstable money demand. The implication for the actual economy is that when uncertainty stems from shifts in asset demand, the interest rate is superior intermediate target.

The study concludes that, for both countries government policies play an important role in economic performance. So, a careful policy should be the foremost important factor for economic in these nations and the every country in general.

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