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Indonesia's Short Term Capital Inflows during 2005 – 2015: A Blessing or a Curse?

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ABSTRACT

This study attempts to assess simultaneous relations between a country's economic performance in real sectors and its short-term capital inflow patterns. The latter utilized stock market data while the former used real GDP data. It observes three major economic sectors of primary, manufacturing, and service sectors as each of them has unique economic behavior. This study utilized time-series data observation from 2005 to 2015. It adopted the system equation of Three-Stage Least Square estimator (3SLS), to achieve efficient and unbiased results of the study's objectives. This study found that short-term capital inflows generated significant and positive impact on real GDP and the opposite. It shows that Indonesia's real economy and financial sector are simultaneously affecting each other. It is confirmed that real market performance affects financial sector and the other way around. In terms of sectors, the most significant result on simultaneous relations happened to the primary sector; while insignificance to manufacturing and one-way relation to the relationship of stock and economic growth of service sector. It convinced that Indonesia's stock market flows have been affected by the real economic performance.

JEL Classification: C30; E22; F21

Keywords: real sector; portfolio inflow; the relation of real sector and portfolio inflows; manufacture sector; Indonesia

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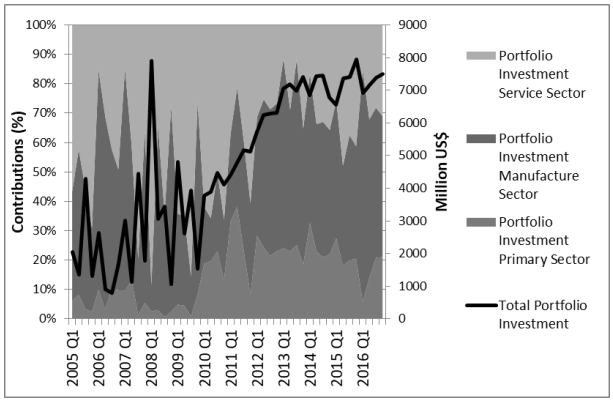
INTRODUCTION

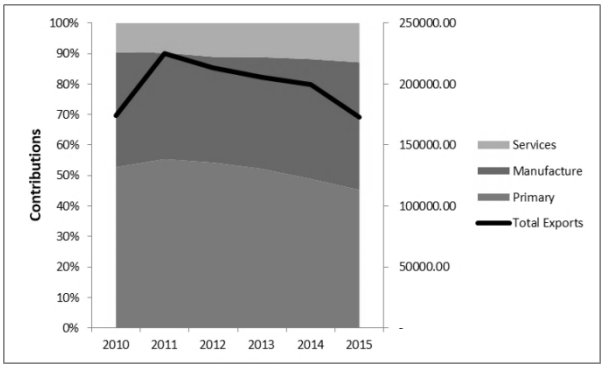
In the last two decades, the world experienced at least three large capital inflows – flowing from Advanced to the Emerging Economies (Azis and Shin, 2015). The first one started in the early 1990s and ended with the Asian Financial Crisis in 1997. The second one started in 2003, when the United States' federal funds (US Fed) rate decreased from more than 6% in 2001 to just 1% in mid-2003. In the same period, the European Central Bank (ECB) interest rate fell from over 4% to 2%, and ended in 2008 as the wake of the Global Financial Crisis. The massive capital inflows to the developing countries drove the subsequent collapse of Lehman Brothers in September 2008, as The Fed was forced to make the Rates drop to 0.25 %, followed by the unprecedented Quantitative Easing Policy by US Fed and ECB. Indonesia, as one of the developing countries in Asia, also experienced series of large capital inflows from advanced economies. It was shown by the steep rise of the equity portfolio investment post-QE on 2009 Q2. Indonesia is a developing country in which manufacture is the largest economic sector; and the emerging economy attracts both the short and long run capital inflows. Figure 1 below shows the portfolio investment movements in Indonesia from 2005 to 2016.



Source: Bank Indonesia Online Database

Figure 1 Movements of Portfolio Investments

On the other hand, the manufacture share in the GDP was decreasing as its economic growth was lower than the national economic growth. From external balance, Indonesia is weak in competitiveness as its export dominantly in the primary sector, with low contribution in manufacture and service sectors. Yet in term of growing as shown on the figure, Indonesia's export performance in primary sector was decreasing while the performance of manufacture increased. This is a good sign for the real sector. This paper attempts to evaluate the relations between the real sector competitiveness and the portfolio inflows as portfolio inflow follows the real sector performance.



Source: National Statistics (BPS), OECD Statistics

Figure 2 Indonesia's Export Performance

According to Sula et al. (2009), portfolio inflows consist of both domestic bond and equity investments owned by foreign investors. Portfolio investors can buy or sell their stocks or bonds relatively easier than foreign direct investment; and these flows are often considered as the hottest among the various major types of capital inflows. Portfolio flows are also more susceptible to asymmetric information problem and herding behavior. The latter based on Keynes argument on beauty contest that investors' decisions are not based on their expectation but based on the big player actions. Calvo and Mendoza (2000) also showed how global diversification of portfolios and problems on asymmetric information can cause rational herding behavior in the financial markets.

Cochrane (2005) found there was a misperception between the disconnectivity in the decision of financial markets and real sector; such as the macroeconomists missed to utilize appropriate data on the equity market for their macroeconomics models. Moreover, many financial market's decision makers dismissed macroeconomic approaches to asset pricing because portfolio-based models would "work better", as it is believed in making smaller pricing error. Meanwhile, there is a probability that movements in financial markets are partly decided on macroeconomics variables in this study.

ANALYTICAL FRAMEWORK

Logical Framework

This study would first elaborate preliminary insight about the channeling flow on why portfolio investment can induce economic growth and vice versa. An increase in portfolio investment will increase domestic businesses as it increases stock market. An increase in a company's capital can result in an increase in real investment, such as business fixed investment. A real investment then can raise real GDP and the economy grows. On the other hand, the increase in GDP means that the potential market size is getting bigger therefore the purchasing power of the population also increases. The bigger the market size, the larger the potential consumers; hence revenue expectation also increases. An increase in potential revenue brings brighter future on profitability, and that would make foreign investor interested in buying more stocks in Indonesia; at the end, the portfolio investment would increase.

In addition, this study proved that in Indonesia, the sector that brings the best impact to real sector from the incurence of equity portfolio inflows is the real sector with strong external balance in terms of export contribution. The export performance is a significant variable providing a signal of firms' profitability, which attracts foreign investor interest to invest in related sectors.

LITERATURE REVIEW

Foreign portfolio investment increases the liquidity in domestic capital market as well as improves financial market efficiency (Evans, 2002). As markets become more liquid, a wider range of investments can be financed. New firms will have bigger opportunity in receiving start-up financing. Foreign equity portfolio investment can also bring knowledge spillover into the domestic capital markets. As firms compete for financing, they will face demands for better information, both in terms of quantity and quality. This is an impact of more transparent disclosure that positively increases spillover effects to other economic sectors.

Moreover, foreign portfolio investment will enhance stock market development and promote the shareholders' voice in corporate governance. As companies strongly compete to be financed, the market will reward those with better performance, better prospects for future performance, and better corporate governance. Well-developed equity markets will also facilitate takeover, a point where portfolio and direct investment is overlapping. Takeovers can turn a poor-managed firm into more efficient and well managed one; thus, it improves the firm's profitability, investor's financial return, and finally, the whole domestic economy.

On a more technical side, there is one critical reason why financial sector is essential to the real sector performance, particularly for the short run. As stock is a part of household wealth, a boom in stock market will make people who own stocks become wealthier; it will then stimulate consumers' spending and at the end

increases the aggregate demand (Mankiw, 2006).[1] In the short-run, the aggregate demand (AD) curve will shift to the right as it increases consumption; yet does not affect the price level due to the sticky price, with the assumption that the short run aggregate supply is constant. This will increase the national output (GDP) and price level in the long run, as factor price will adjust to the increased level of output. However, if there is a crash in stock market, then people who own a share of stocks will be poorer, hence reducing their consumption. The particular phenomenon would decrease the aggregate demand. In the medium to long run a decrease in aggregate demand will decrease both GDP and the price level.

On the short run, foreign portfolio investment affects positively to GDP, and the GDP makes positive impact on Foreign Portfolio Inflows (Mucuk *et al.*, 2014). But the co-integration test proved otherwise, as there is no long run causality between the two variables. Jongwanich and Kohpaiboon (2012) showed the impacts of capital flows to exchange rate vary on the types of capital flows. The study shows that portfolio investment carries a quick adjustment in real exchange rate appreciation than that in foreign direct investment (FDI). Based on the estimation results using dynamic panel-data model, the magnitude of real exchange rate appreciation towards the value of FDI, even with a time lag, tends to be similar to the flow of portfolio investment. This study implied that foreign portfolio investment impacts negatively to the economy, as currency appreciation tends to lower net export, and hence lower aggregate output.

On the other hand, the theory behind why economic performance of a country could be a good indicator for portfolio investment was initially proposed by Fama (1970). His theory is well known as the Efficient Market Hypothesis, stating that stock price of a firm "fully reflects" all firm's available information at all time. The economic performance shows the profitability of firms in a country. Therefore, investors' asset allocation can be adjusted given the changing of the country's economic condition. A good economic performance usually shows higher profits for domestic companies. This is the impact of the increasing market size. Based on the Efficient Market Hypothesis, if the future profitability of a firm increases and the investors get the signal properly, then the demand of stock of the company would be higher, hence increasing stock price for particular companies. However, this model is not perfect since there are many criticisms stating this model deviates from the movements in stock markets[2].

In order to prove this theoretical foundation, Agarwal (1997) constructed the model of pooled least square estimation methods and showed that real exchange rate, relative size of domestic capital market, and economic activity index were the most significant and positive variables affecting foreign equity portfolio investment inflows; while inflation rate showed the opposite as it negatively affected foreign equity portfolio investment inflows. Agarwal model was based on the data from 5 Asian countries (India, South Korea, Malaysia, Indonesia, Thailand) during the 1986-1993 period. Recent study by Duasa and Kassim in 2009 using quarterly data from 1991 to 2006 with Granger Causality and Toda-Yamamoto non Causality tests showed that foreign portfolio investment in Malaysia did not significantly cause aggregate output to grow; however the dynamic effects in aggregate output attracted foreign portfolio investment.

METHODOLOGY

Model Specification

This study uses system equation models, as it assumes that there are two ways of causality between two endogenous variables. The model equations were adapted and modified from previous studies. There are few steps needed to precisely estimate the effects of portfolio capital flows on macroeconomics variables.

The first step is estimating the variables with multiple regressions using ordinary least square. Two of the following equations are tested using the multiple regressions:

$$lnRGDP_t = \alpha_0 + \alpha_1 lnPI_t^i + \alpha_2 \pi_t + \alpha_3 M3_t + \alpha_4 TB_t + u_{1t} \dots (1)$$

On the first equation, Real GDP, as a proxy of economic performance or total output, acts as the endogenous variable; whereas the portfolio capital inflows act as the primary explanatory variables. The portfolio

[1] In the scope of macroeconomics, the mechanism of the market is shown by the aggregate supply and aggregate demand framework (AS-AD curve), where the model elaborate the relation of aggregate supply (factor market) and aggregate demand to explain price level and aggregate output (GDP)

[2] See Jensen, M. C. (1978) regarding the compiled criticism for the model.

inflows have an "i" superscript due to the variable divided into three main economic sectors, which are primary, manufacture, and services sectors. Therefore, in total, there are four sets of models in equation 1 (including the total Portfolio Investment). The three other variables used at the right-hand side are the control variables that have been utilized in this equation; they are inflation rate, broad money in circulation, and trade balance. To smooth out the regression, this study uses natural logarithm form on Real GDP and the Portfolio Investment:

$$lnPI_t^i = \beta_0 + \beta_1 lnRGDP_t + \beta_2 lnIR_t + \beta_3 lnPk_t + \beta_4 lnRes_t + u_{2t} \dots (2)$$

On the second equation, the portfolio capital inflows are used as the endogenous variable, while Real GDP is used as the primary explanatory variable. The other explanatory variable provided in the equation is this model's controlled variables. They are interest rate, stock price, and foreign reserve held by central banks. In order to smooth out the regression, all variables are transformed into the natural logarithm form. The list of variables used in the equation, along with their units on measurement and sources, can be seen on Appendix A.

In both equations, this study makes real GDP (rGDP) and foreign portfolio equity investment as endogenous variables and at the same time exogenous variables. This will generate endogeneity, weaken the model and decrease its power of the test. This will create a biased result, thus it needs solution. In order to solve the endogeneity problem and the contemporaneous correlations that arise in equation (1) and (2), this study adopted Three Stages Least Square (3-SLS) Estimation method. The 3-SLS estimation method has been perceived as a combination of Two Stages Least Square (2-SLS) and Seemingly Unrelated Regression (SUR) estimation methods. It is adopted into a system of equation models which are endogenous. Each equation has endogenous variables on both the left-hand side and right-hand side of the equation. That part is where the 2SLS plays its role. By using the 2SLS method, the explanatory variable's value was replaced by their fitted values.

However, there are still error terms occurred in each equation which were also correlated. This is where SUR method played its role. By using Feasible Generalized Least Square, efficient estimation was provided, and therefore correlation between the two equations' error terms could be neutralized. The utilization of 3SLS estimation method makes the regression results more efficient and unbiased than the untreated Ordinary Least Square (OLS) estimation method.

In order to complete the causality test between foreign equity portfolio investment and country's economic performance, this study used predictive causality test of time series model. This study utilized the *Granger Causality test* to test the predictive causality between foreign equity portfolio investment and real GDP. This is based on the understanding that foreign equity portfolio investment variable in time-wise will have Granger-causality to the real GDP variable, since the predictions of the value of Real GDP has been based on its own past values. The past values of Foreign Portfolio Investment generate more robust result than the predictions of Real GDP which are just based on its own past values. In this test, the adopted variables are only the two out of all selected variables. They are the Foreign Portfolio Investment (three main sectors and the total), and the Real GDP.

Data Characteristics

This study uses several variables that ranged from 2005Q1 until 2015Q4 on quarterly basis. The main variables are the foreign portfolio equity investment and real GDP. The portfolio investment is then divided into three main economic sectors: primary, manufacture, and service sectors. The other variables that are taken as explanatory variables are the inflation rate, trade balance, broad money in circulation (M3), interest rate, stock price index, and foreign reserve held by central bank. As this study is about Indonesia's economy therefore all the variables data are limited to Indonesia; data and values in the US$ to avoid the exchange rate bias. Data were extracted from the Organization for Economic Cooperation and Development Statistics (OECD) database and the International Monetary Fund (IMF) database, except for the foreign equity portfolio inflows that were extracted from the Bank Indonesia online database.

Since the equity portfolio investment data are stock data, the challenge is to adjust the frequency from daily basis to quarterly basis. To resolve this problem, the data were taken on every last day of the quarter.[3] This method of data collection is extensively used in finance researches that used financial market data.

[3] March 31st for Quarter 1, June 30th for Quarter 2, 30th September for Quarter 3, and December 31st for Quarter 4. The data is extracted on these dates every year from 2005-2015.

RESULT AND DISCUSSION

Descriptive Analysis

Scatterplot will result in a simple correlation between two sets of data. The scatterplot analysis can provide preliminary inference whether real GDP and Portfolio investment either has a positive or negative correlation. This study shows scatterplot between real GDP and foreign equity PI on the three different sectors. But note that scatterplot does not provide causality analysis, so it cannot be inferred whether foreign equity PI affects real GDP or the real GDP affecting foreign equity PI. If the regression line from the plot is steeper and the confidence interval area (the brown area surrounding the regression line) is smaller, then the correlation is suspected to be stronger.

From Appendix D, it is shown that based on the fitted value, total foreign equity PI and real GDP are positively correlated. It means that movement in foreign equity PI results in movement on real GDP, and movement in real GDP results in movement in foreign equity PI, at 95% level of confidence. But what is interesting on the scatterplot is that it seems to have a structural break on the data. On the left side of the scatterplot, the plot seems to have no correlation. But on the right side, real GDP and foreign equity PI seem to be positively correlated and most of the plot falls within the confidence interval. The structural break might have arisen from the global financial crisis in 2008 which impacted the volatility of movements in foreign equity PI. Based on the division of three main economic sectors, the regression line on the primary sector is the steepest among the three sectors, and it also has the thinnest confidence interval area. It is implied that foreign equity portfolio investment on primary sector had the strongest correlation towards real GDP, compared to the manufacture and service sectors.

On the other hand, the regression line between foreign equity PI on manufacture sector and real GDP is steeper than the regression line found in the foreign equity PI on service sector and real GDP. However, the confidence interval area is bigger than the latter; meaning while portfolio investment could bring larger change in the aggregate output, it might have adverse effects due to its more volatile nature. Hence, the service sector is more significant, judging only from the plot. However, judging from the correlation coefficient based on the matrix in Appendix C, the highest value of correlation is found between the real GDP and the foreign equity portfolio investment in primary sector, followed by manufacturing sector and services sector in the last spot. While the primary sector's result is consistent with the plot, the manufacture and services sector coefficient seem to have different implications from the plot. Therefore, regression analysis is needed to ensure the causality and the impacts.

Regression Analysis

In Table 1, this study compared the results of using the OLS, SUR, 2SLS, and 3SLS for testing the simultaneous equations specified on the previous section. While having the highest R-Squared, the results provided by the OLS tend to be biased and inefficient since it generates endogeneity problem and contemporaneous correlation. On the other hand, even the 3SLS model provided lower R-Squared value than that in the OLS and SUR, yet the results are unbiased and efficient. Therefore, this study focuses on 3SLS result method.

It can be inferred that the percentage changes in total portfolio investment significantly affect positively the percentage changes on real GDP. All the methods used by this study proved this. Simultaneously, percentage changes in real GDP significantly affect positively the percentage changes in foreign equity PI. As both primary variables are in their natural logarithm forms, the coefficient showed the elasticity of the variables presented. The results revealed that real GDP was elastic to changes in total foreign equity portfolio investment, but it was not proven otherwise.

Moreover, in Table 2, the regression results showed the cross-sector comparison on the two-way causality, percentage change in foreign equity portfolio investment in different sectors affects the percentage change in the GDP and vice versa. Given its R-square result, this study found the best model to explain the endogenous variables is the primary sector model of foreign equity. In the primary sector, both main variables are significant and positive in affecting each other. This indicates that there was two-way causality between the primary sector (foreign equity PI) and the real GDP.

On the other hand, the less significant model in explaining the endogenous variables is the model of manufacture sector foreign portfolio investment. It is seen from the irregularity provided in the R-Square. It has a

negative value on the relation between foreign portfolio investment in manufacture sector and its real GDP. While extremely rare, the negative value of R-Square is still possible[4]. In addition, from endogeneity test, this study found (see Appendix E) there is no evidence of how both equations from the manufacture sector interact to each other.

It can be seen on the regression results that there are several incoherencies between the expected impacts and the finding in the regression results. The first incoherence is that the trade balance negatively affects real GDP on the primary sector, service sector, and total foreign equity portfolio investment models. This is similar to the study conducted by Sachs (1981) that found current account balance could be countercyclical to the GDP as current account deficits could induce investment boom. This study was strengthened by Baxter and Crucini (1993), which found that the smaller the country, the countercyclical effect of trade account increased due to the increased international capital flows.

The second incoherence is how the manufacture sector model has anomalies to the direction of the causality, such as inflation rate and money in circulation that negatively affects the real GDP, and foreign reserve which negatively affects foreign equity portfolio investment in manufacture sector. All of which might be resulted from the misspecification of the model. The misspecification of the model was proved by the negative value of the R-squared. Negative R-squared implied that the chosen models, along with their constraints, fitted the data poorly.

Table 1 Regression Estimates between Total Foreign Equity PI and real GDP

	OLS	**SUR**	**2SLS**	**3SLS**
First Equation	**lnrGDP**	**lnrGDP**	**lnrGDP**	**lnrGDP**
lnPI	0.235**	0.487***	1.125***	1.093***
	(1.99)	(4.83)	(2.78)	(3.15)
M3	0.0110***	0.00860***	0.00411	0.00152
	(5.12)	(4.53)	(0.94)	(0.41)
Infl	0.00458	0.00761	0.0113	0.00332
	(0.33)	(0.65)	(0.52)	(0.30)
TB	1.38e-09	1.85e-09	3.37e-08	-5.00e-10
	(0.07)	(0.10)	(0.96)	(-0.03)
_cons	9.035***	5.462***	-3.712	-2.902
	(5.26)	(3.74)	(-0.64)	(-0.60)
Second Equation	**lnPI**	**lnPI**	**lnPI**	**lnPI**
lnrGDP	0.325	0.619***		0.775**
	(1.25)	(2.77)		(2.44)
IR	-0.0456	-0.0709*		-0.0153
	(-1.02)	(-1.83)		(-0.38)
lnPShare	0.767*	0.195		0.00946
	(1.72)	(0.52)		(0.06)
lnRes	-0.292	-0.0135		0.0500
	(-0.46)	(-0.03)		(0.11)
_cons	10.83**	6.416*		3.931***
	(2.58)	(1.81)		(2.72)
N	44	44	44	44
R-sq	0.810	0.787	0.533	0.537

Note: t statistics in parentheses: * p<0.1 ** p<0.05 *** p <0.01; source: Author's calculation

[4] The value of $R - Squared$ will be negative when the horizontal line of $\bar{y}$ actually explains the data better than the line of best fit. Mathematically, the value of R^2 can be negative if $(y - \hat{y})$is negative and $(\hat{y} - \bar{y})$ is positive, or vice versa.

Table 2 Regression Summary on Different Sectors

First Equation	Primary lnrGDP	Manufacture lnrGDP	Service lnrGDP
lnPI1	0.487***		
	(4.65)		
lnPI2		3.154	
		(1.23)	
lnPI3			0.837***
			(3.00)
M3	0.00173	-0.0128	0.00645
	(0.76)	(-1.17)	(1.48)
Infl	0.00535	-0.0143	0.0144
	(0.72)	(-0.31)	(0.99)
TB	-3.05e-09	0.000000182	-2.11e-08
	(-0.23)	(0.64)	(-0.89)
_cons	7.348***	-29.16	1.119
	(6.31)	(-0.83)	(0.32)
Second Equation	**lnPI1**	**lnPI2**	**lnPI3**
lnrGDP	1.530***	1.625***	-0.0814
	(2.94)	(2.82)	(-0.17)
IR	-0.0388	0.0440	-0.0722
	(-0.75)	(1.01)	(-0.98)
lnPShare	-0.0668	0.404	-0.468
	(-0.19)	(1.07)	(-1.35)
lnRes	0.519	-1.707*	1.626**
	(0.54)	(-1.78)	(2.19)
_cons	-13.51***	8.560**	-0.148
	(-3.54)	(2.14)	(-0.04)
N	44	44	44
R-square	0.819	-2.339	0.227

Note: t statistics in parentheses: * p<0.1 ** p<0.05 *** p <0.01 ; source: author's calculation

Granger Causality Result

Based on the results in Table 3, unlike the least square estimation methods counterpart, changes in total foreign equity PI have granger causality to real GDP, and changes in real GDP do not have granger causality with foreign equity PI, in one quarter lag. Note that the variables were transformed into the first difference-form as to be stationary, and the lags were selected based on the Akaike Info Criterion to ensure the optimum lag.

The result implied that movements in portfolio investment could not explain the movement of the real GDP, on the contrary to the previous methods. However, consistent to the previous methods, movements in real GDP could explain the movement of total portfolio investment. The difference between the results probably arose because in the granger causality test, the data must be transformed into their first difference-form. In addition, there was no control variable that made the data be statistically significant in affecting the endogenous variable.

Pairwise, Granger causality test results on foreign equity portfolio investments in different sectors are presented in Table 3. The results show that both foreign equity portfolio investment in primary and service sector granger caused real GDP, but the real GDP granger caused foreign equity portfolio investment only in primary sector. Moreover, foreign equity portfolio investment in manufacture sector did not show granger causality to real GDP, and the opposite.

The result is moderately consistent with the estimation methods used in the previous section. Primary sector is very consistent with the previous estimation method; both methods implied a two-way causality between the two variables. The manufacturing sector is also consistent with the previous estimation method; both methods showed there was no causality between the two variables. Result on the service sector is somewhat consistent; though portfolio investment in service sector affected real GDP in both methods, but on the least square method, the real GDP did not affect portfolio investment in service sector on both methods. However, if 10% significance level is used in the granger causality test, then real GDP affects the movement of portfolio investment in case of service sector.

Table 3 Pairwise Granger Causality Results Table

Lags[5]	Excluded	p-Value	Result[6]	Causality
1	lnPI ⍰ lnrGDP	0,084	Reject H0	1 Way Causality: Total PI granger causes real GDP
	lnrGDP ⍰ lnPI	0,234	Do not Reject H0	
4	lnPI1 ⍰ lnrGDP	0,007	Reject H0	2 Way Causality
	lnrGDP ⍰ lnPI1	0,005	Reject H0	
6	lnPI2 ⍰ lnrGDP	0,246	Do not Reject H0	No Causality
	lnrGDP ⍰ lnPI2	0,079	Do not Reject H0	
1	lnPI3 ⍰ lnrGDP	0,015	Reject H0	1 Way Causality: PI Service sector granger causes real GDP
	lnrGDP ⍰ lnPI3	0,064	Do not Reject H0	

Source: Author's calculation.

CONCLUSION

Applying the three-stage least square estimation method to treat endogeneity problem and system equation behavior, this study found that, during the period of 2005-2015, Indonesia's overall portfolio investment carried significant and positive impact on real GDP; which then real GDP positively affected portfolio investment. It was implied that real and financial sector in Indonesia were interrelated. Therefore market mechanism on financial sector follows real sector performance, hence a rational decision is present, and in turn, portfolio investment could also induce better performance on the economy. This study proves that short-term capital inflows are a blessing for Indonesia.

This study also found that portfolio investment in primary sector is the most fitted to induce economic performance, and the opposite to the manufacturing sector. Although service sector significantly affected the economic growth, this study found that there was no two-way causality occurred in the regression. The results were further amplified by the predictive causality test, where most of the results were consistent with the least square estimation methods.

Although this study came with a fresh take on finding a two way causality relationship between the foreign equity portfolio investment and real GDP, along with the main economic sector breakdown, there were several things that haven't been discussed in the study but would be a great advice for further study. The first concern is the scope of research. While the data has been updated, this study was conducted on a time series basis rather than a panel data analysis. A panel data analysis is useful for a better understanding in the relationship between the portfolio investment and economic performance in the developing countries, as it is believed that Indonesia alone cannot represent all developing countries. Moreover, the economic sector should further be elaborated to the subsector level, to gain more desirable insights on how effective the financial market affects the performance on each subsector.

REFERENCES

Agarwal, R. N. (1997), "Foreign portfolio investment in some developing countries: A study of determinants and macroeconomic impact", *Indian Economic Review*, pp. 217-229.

Aizenman, J., Binici, M. and Hutchison, M .M. (2014), *The transmission of Federal Reserve tapering news to emerging financial markets* (No. w19980), National Bureau of Economic Research.

Azis, I .J. and Shin, H. S. (2015), *Managing Elevated Risk*, Springer-Verlag GmbH.

Baxter, M. Crucini, M. J. (1993), "Explaining saving--investment correlations", *The American Economic Review*, pp. 416-436.

Benigno, G., Converse, N. and Fornaro, L. (2015), "Large capital inflows, sectoral allocation, and economic performance", *Journal of International Money and Finance*, Vol. 55, pp. 60-87.

[5] Lags are selected based on Akaike Info Criterion
[6] With 5% level of Significance

Calvo, G. A. and Mendoza, E. G. (2000). "Contagion, globalization, and the volatility of capital flows." In *Capital flows and the emerging economies: theory, evidence, and controversies* (pp. 15-41). University of Chicago Press.

Cardarelli, R., Elekdag, S. and Kose, M. A. (2010), "Capital inflows: Macroeconomic implications and policy responses", *Economic Systems*, Vol. 34 No. 4, pp. 333-356.

Cochrane, J. H. (2005), "Financial markets and the real economy", *Foundations and Trends in Finance*, Vol. 1 No. 1, pp. 1-101.

Davis, J. S. (2015), "The macroeconomic effects of debt-and equity-based capital inflows", *Journal of Macroeconomics*, Vol. 46, pp. 81-95

De Santis, R. A. and Lührmann, M. (2009), "On the determinants of net international portfolio flows: A global perspective", *Journal of International Money and Finance*, Vol. 28 No. 5, pp. 880-901.

Duasa, J. and Kassim, S. H. (2009), "Foreign portfolio investment and economic growth in Malaysia", *The Pakistan Development Review*, pp. 109-123.

Evans, K., (2002), "Foreign Portfolio and Direct Investment: Complementarity, Differences, and Integration", *OCDE Global Forum on International Investment: Attracting Foreign Direct Investment for Development*, Shanghai, 5-6 December.

Fama, E. F. (1970), "Efficient capital markets: A review of theory and empirical work", *The journal of Finance*, Vol. 25 No. 2, pp. 383-417.

Forbes, K. J. and Warnock, F. E. (2012), "Capital flow waves: Surges, stops, flight, and retrenchment", *Journal of International Economics*, Vol. 88 No. 2, pp. 235-251.

Giannetti, M. (2007), "Financial liberalization and banking crises: The role of capital inflows and lack of transparency", *Journal of Financial Intermediation*, Vol. 16 No. 1, pp.32-63.

Gujarati, D. N. (2009), Basic Econometrics, Tata McGraw-Hill Education.

Jensen, M. C. (1978), "Some anomalous evidence regarding market efficiency", *Journal of financial economics*, Vol. 6 No. 2-3, pp. 95-101.

Jongwanich, J. and Kohpaiboon, A. (2013), "Capital flows and real exchange rates in emerging Asian countries", *Journal of Asian Economics*, Vol. 24, pp. 138-146.

Keynes, J. M. (2016), *General theory of employment, interest and money*, Atlantic Publishers & Dist.

Mankiw, Gregory N. (2012), *Macroeconomics* (8th Edition), New York: Worth Publisher.

Mucuk, M. and Demirsel, M. T. (2014), The Relationship Between Foreign Portfolio Investments And Economic Growth: The Case Of Turkey, In Proceedings of *International Academic Conferences* (No. 0702082), International Institute of Social and Economic Sciences.

Rachdi, H. and Saidi, H. (2011), "The Impact of Foreign Direct Investment and Portfolio Investment on Economic Growth in Developing and Developed Economies", *Interdisciplinary Journal of Research in Business*, Vol. 1 No. 6, pp. 10-17.6

Reinhart, C. M. and Reinhart, V. R. (2008), Capital flow bonanzas: an encompassing view of the past and present (No. w14321), *National Bureau of Economic Research*.

Sachs, J. D. (2006), "The Current Account and Macroeconomic Adjustment in the 1970s"', *Brookings Papers on Economic Activity*, Vol. 1 No. 1, pp. 201-68.

Sula, O. and Willett, T. D. (2009), "The reversibility of different types of capital flows to emerging markets", *Emerging Markets Review*, Vol. 10 No. 4, pp. 296-310.

Tillmann, P. (2013), "Capital inflows and asset prices: Evidence from emerging Asia", *Journal of Banking & Finance*, Vol. 37 No. 3, pp. 717-729.

Tobin, J. and Brainard, W. C. (1976), *Asset markets and the cost of capital* (No. 427), Cowles Foundation for Research in Economics, Yale University.

Wang, C. H., Hwang, J. T. and Chung, C. P. (2016), "Do short-term international capital inflows drive China's asset markets?", *The Quarterly Review of Economics and Finance*, Vol. 60, pp. 115-124.

Zellner, A. and Theil, H. (1962), "Three-stage least squares: simultaneous estimation of simultaneous equations", *Econometrica: Journal of the Econometric Society*, pp. 54-78.

Zellner, A. (1962), "An efficient method of estimating seemingly unrelated regressions and tests for aggregation bias", *Journal of the American statistical Association*, Vol. 57 No. 298, pp. 348-368.

APPENDICES

Appendix A List of Variables Used

Variables	Specifications	Source	Unit
PI	Total Foreign Portfolio Equity Investment	Bank Indonesia Online Database (Access from BKPM)	Thousand US$
PI1	Foreign Portfolio Equity Investment on Primary Sector	Bank Indonesia Online Database (Access from BKPM)	Thousand US$
PI2	Foreign Portfolio Equity Investment on Manufacture Sector	Bank Indonesia Online Database (Access from BKPM)	Thousand US$
PI3	Foreign Portfolio Equity Investment on Services Sector	Bank Indonesia Online Database (Access from BKPM)	Thousand US$
rGDP	Real GDP	International Financial Statistics, IMF	Million US$
π	Inflation Rate	Calculated from International Financial Statistics, IMF	Percentage
TB	Trade Balance	OECD Statistics	Thousand US$
M3	Broad Money in Circulation	OECD Statistics	Index
IR	Interest Rate	OECD Statistics	Percentage
Pk	Stock Price (Index)	OECD Statistics	Index
Res	Foreign Reserve	International Financial Statistics, IMF	Million US$

Appendix B Summary of Variables

Variable	Obs	Mean	Std. Dev.	Min	Max
lnPI1	48	12.95038	1.449448	9.860345	14.61992
lnPI2	48	14.29678	.7558653	12.8255	15.51334
lnPI3	48	14.19588	.763509	12.54225	15.76096
M3	46	115.1462	51.17789	46.21125	210.3852
Infl	44	9.768769	5.378276	1.639337	21.13177
CAB	44	-1348745	4012383	-8696592	4630460
IR	44	8.044167	1.699003	5.656667	12.24667
lnPShare	44	4.497533	.5237579	3.553968	5.163726
lnRes	44	11.15464	.428542	10.27022	11.66247
lnrGDP	44	13.86163	.7079948	12.96363	14.65392
lnPI	48	15.20587	.6680845	13.5692	15.88726

Source: Author's compilation

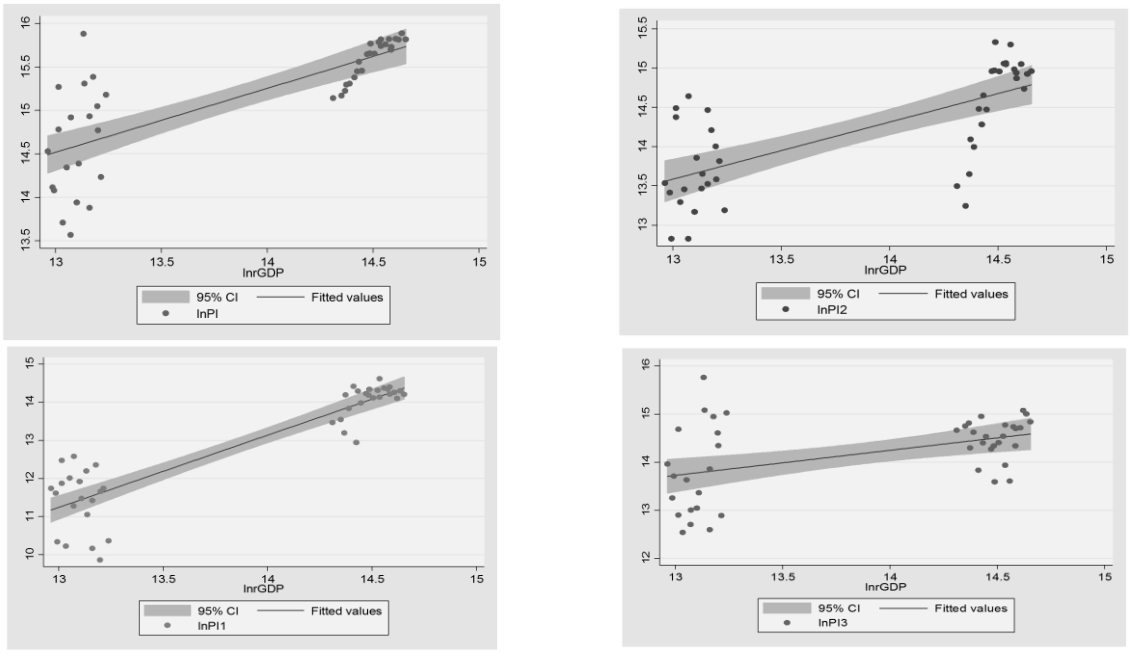
Appendix C Correlation Matrix between Variables Used

	lnPI	lnPI1	lnPI2	lnPI3	lnrGDP	IR	lnPShare
lnPI	1.0000						
lnPI1	0.7785*	1.0000					
lnPI2	0.7966*	0.7542*	1.0000				
lnPI3	0.7542*	0.3935*	0.2607*	1.0000			
lnrGDP	0.7734*	0.9051*	0.7043*	0.4659*	1.0000		
IR	-0.5197*	-0.5182*	-0.3888*	-0.3756*	-0.5214*	1.0000	
lnPShare	0.7934*	0.8252*	0.7258*	0.4766*	0.9143*	-0.5431*	1.0000
lnRes	0.7691*	0.8341*	0.6962*	0.4649*	0.9378*	-0.5266*	0.9611*

	lnrGDP	lnPI	lnPI1	lnPI2	lnPI3	M3	Infl
lnrGDP	1.0000						
lnPI	0.7734*	1.0000					
lnPI1	0.9051*	0.7785*	1.0000				
lnPI2	0.7043*	0.7966*	0.7542*	1.0000			
lnPI3	0.4659*	0.7542*	0.3935*	0.2607*	1.0000		
M3	0.8887*	0.7699*	0.7584*	0.8019*	0.4175*	1.0000	
Infl	-0.6460*	-0.6041*	-0.6960*	-0.6566*	-0.2802*	-0.7359*	1.0000
CAB	-0.7185*	-0.6935*	-0.6964*	-0.8311*	-0.2777*	-0.7926*	0.6284*

Source: Author's compilation

Appendix D Scatterplot of PI in Various Sector and real GDP



Note: Y Axis on Upper Left: Total Portfolio Investment; Upper Right: Primary Sector Portfolio Investment; Lower Left: Manufacture Sector Portfolio Investment; Lower Right: Services Sector Portfolio Investment

Appendix E Durbin–Wu–Hausman EndogeneityTest Results

Total Portfolio Investment:

```
. test lnPI_res2

 ( 1)  lnPI_res2 = 0

       F(  1,     38) =    23.76
            Prob > F =     0.0000
```

Portfolio Investment in Primary Sector:

```
. test lnPI1_res

 ( 1)  lnPI1_res = 0

       F(  1,    38) =  479.63
            Prob > F =    0.0000
```

Portfolio Investment in Manufacture Sector:

```
. test lnPI2_res

 ( 1)  lnPI2_res = 0

       F(  1,    38) =    0.23
            Prob > F =    0.6368
```

Portfolio Investment in Service Sector:

```
. test lnPI3_res

 ( 1)  lnPI3_res = 0

       F(  1,    38) =   10.11
            Prob > F =    0.0029
```