Evaluation of the Effects of Capital Inflows on the Real Economy and Monetary/ Financial Sector in Indonesia: Lessons from the Post-IMF Policy Reform on Capital Account Management and Controls

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Abstract

This paper analyses the effects of the policy changes in capital account liberalization and controls in Indonesia during the post-IMF program since 2004 and compare the previous period of liberalization regime before/after the Asian Crisis as well as the period under the IMF program in 1994-2003. The analysis based on the VAR (vector autoregressive) and Bayesian VAR models confirmed that capital controls and management of the Indonesian authority have actually worked to stabilize the economy, and to minimize the effects of capital inflows in the markets after the termination of the IMF program during the period 2004-2016Q1. The results indicate that the Indonesian economy has become less dependent on capital flows in the real economy as well as the monetary/ financial sector, which would mitigate the risk of speculative short capital flows since 2004.

Keywords: International Capital Flows, Capital Account Liberalization and Controls, Real Economy, Foreign Exchange and Monetary /Financial Markets

JEL Classification codes: E44, F21, F37, O23, O53

1. Introduction

The issue on capital account management and controls has been recognized as one of the important economic policies among the academics, as well as the parties

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concerned including international organizations especially after the global financial crisis in 2008[1]. Capital controls and management are important policy tools for emerging market economies under the current global economies and markets, where massive capital flows have put constant pressure on the economies concerned for the risk of capital account crises.

This paper examines the effectiveness of capital management and controls not only as short-term measures to avoid speculative capital flows, but also medium-to long-term policy tools to achieve stable economic growth and stabilization of the domestic financial market[2]. Capital account and foreign exchange controls have widely been introduced among major emerging economies in Asian countries, including Indonesia. Indonesia was one of the most seriously affected countries, during the Asian Crisis in 1997/8. With termination of the IMF program in 2003, Indonesia introduced several measures for capital account and foreign exchange controls (e.g. a one-month minimum holding period for certain securities) to stabilize the economy since mid-2000s.

One of the major purposes of this paper is to identify the effectiveness of capital controls and regulations in Indonesia, by comparing between the period of liberalization under the IMF program and pre- and the post-Asian crisis (1994-2003) with the period after the termination of IMF program (2004-2011) in terms of independence of monetary policies, including capital / financial controls.

The result of the analysis in this paper shows that several measures of capital controls have worked to stabilize the real economy and the financial market (money stocks, interest rate, and real effective exchange rate) and minimized the negative effects of capital flows on the domestic market since 2004, compared with the period 1994-2003. Among the capital inflow variables, portfolio and other capital inflows, which are usually short-term and speculative in nature, have more positive response functions of the real economy (GDP growth, production) than that of FDI. This trend is more apparent in the later period (2004-2016Q1) than the previous period over 1994-2003. The impulse response function of 'other' capital inflows (mostly external bank loans) have constantly positive for manufacturing in general, including nondurable manufacturing and energy sectors. The impulse response of manufacturing to FDI inflows has positive one in the nondurable and energy based manufacturing especially during the period 2004-2016Q1.

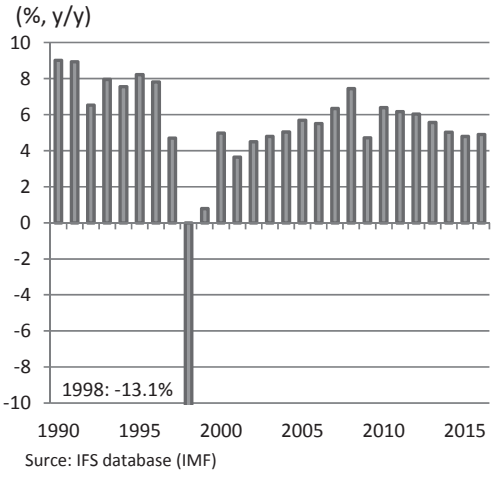
The results indicate that the effectiveness of overall capital controls which have been introduced in Indonesia.

2. Capital Flows and Controls in Indonesia

2. 1 General Overview: the Economy and Capital Flows

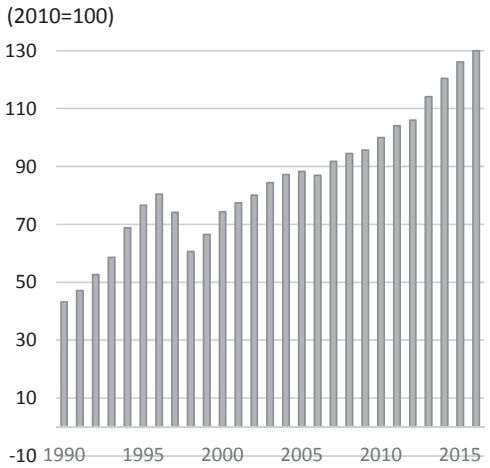
Indonesia has achieved stable economic growth especially after the termination of the IMF program in 2003. Several factors, including independent economic policy, as well as monetary and fiscal policy, may have contributed to such a high performance. The global market conditions of mineral resources, including oil and gas prices, have also benefited the Indonesian economy for economic growth since mid-2000s.

Fig.1-1: Indonesia: GDP Growth



Surce: IFS database (IMF)

Fig1-2: Indonesia: Manufacturing



Source: IFS daatabe (IMF)

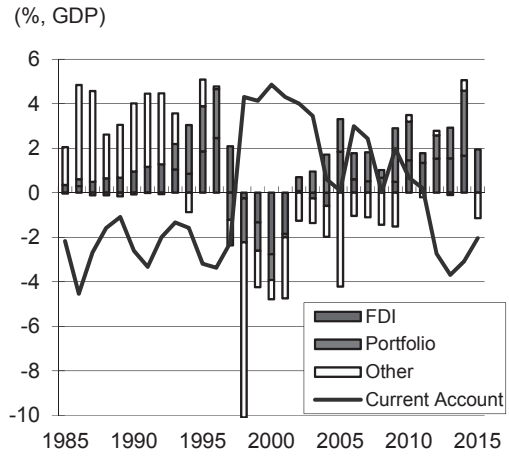
Indonesia substantially liberalized the capital/ financial account since 1980s, which is relatively early among the ASEAN countries. The external borrowing from offshore centers, especially Singapore, increased substantially among the non-financial entities besides banks. Most of the firms had no currency hedging for transactions of foreign exchange, under the inflexible (or nearly fixed) regime of Rupiah during the period before the Asian Crisis (1997/8)[3]. In Indonesia Banks and majority of large firms, which had external debt, had significant loss and suffered from deteriorating balance sheet of those local banks and firms after the Asian Crisis. However, the Indonesian economy has recovered especially since the mid-2000s, and is now joining the club of promising emerging economies after BRICs. It should be noted that it was only after the termination of the IMF program in 2003,

when Indonesia successfully completed early repayment to the IMF.

Capital inflows have affected the real economy as well as monetary and financial markets in Indonesia, especially in the 1990s. Capital inflows increased significantly before the Asian Crisis (1997/8), but the net capital outflows accelerated after the crisis. Although the current account improved after the Asian Crisis, it was the result of deterioration of the economy with significant decrease of imports, which put the current account surplus. The balance of payments has broadly improved and the net capital inflows of FDI and portfolio investment continued after 2004 with the stability of the economy.

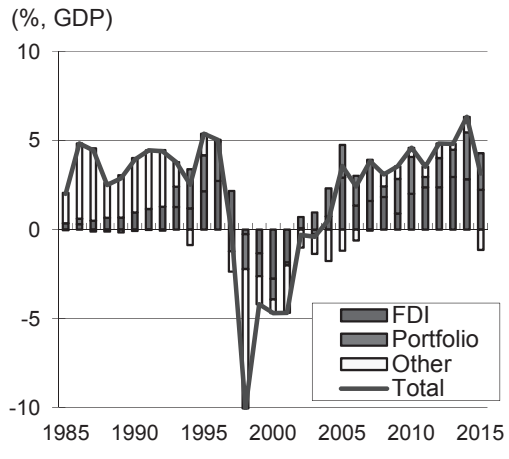
Indonesia could not introduce extensive capital control measures under the IMF program[4], and it was only after the termination of the IMF program in 2003 that the intensive capital management and controls were undertaken. The domestic market has achieved stability since 2004 in terms of the component of the portfolio liabilities, where debt securities have become major component, changed from equity recently (Fig.2-1). The domestic economy and financial market in Indonesia have significantly improved and stabilized since the mid-2000s, even under the expansion of capital flows in the global market in the 2000s. It indicates that the capital market has become relatively stable, since debt securities are generally more stable than stocks or equity securities. Moreover, short-term capital liabilities have decreased significantly since the mid-2000s (Fig.2-2). These recent trends could be explained by the capital management and controls introduced

Fig. 2-1: Net Capital flows and Current Account (Indonesia)



Sources: International Financial Statistics (IMF)

Fig. 2-2: Capital Flows (Liabilities) (Indonesia)



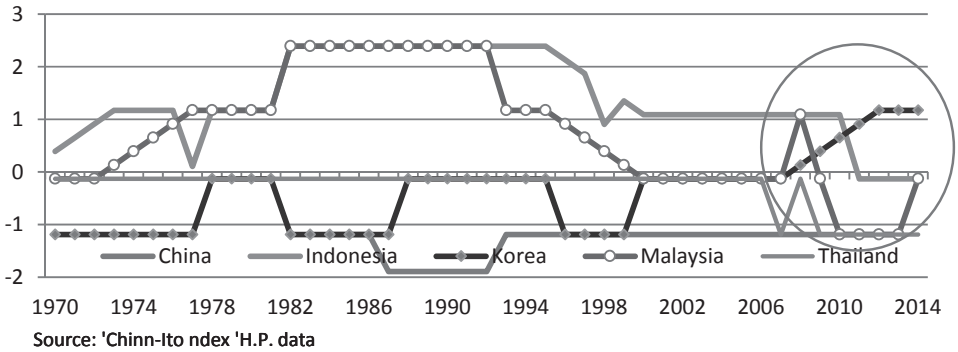
Sources: IFS (IMF)

intensively since the mid-2000s, It should be noted that the independence of monetary policy with flexibility of policy options after 2004 have made the Indonesian economy more stable and resilient to the external shocks of capital and financial turbulence

2. 2 Capital Account Liberalization and Controls in Indonesia: Historical Overview

As mentioned previously, capital account and foreign exchange controls in Indonesia were liberalized relatively early among the Southeast Asian countries since the latter part of 1980s. The KAOPEN (Chinn-Ito index) which shows capital account openness in each country indicates that Indonesia already started liberalization in the 1970s, due to the shortage of foreign exchange from the deterioration of the current account, as well as increase in the interest rates[5] (Fig.4). Major capital account liberalization measures were introduced mainly in the external trading by individual residents, while the overseas investment by the domestic firms was restricted until the end of 1980s.

Fig. 4: KAOPEN (Asia)



Source: 'Chinn-Ito ndex 'H.P. data

Intensive liberalization of capital controls was initiated in the early 1990s, which accelerated capital inflows. However, many banks and firms in Indonesia suffered from 'double mismatch' of the currency (long-term domestic lending with short-term external borrowing of foreign currency that has foreign exchange risk) before the Asian Crisis (1997/8) in Indonesia. The government authority set the ceiling of the swap amount for non-residents just after the contagion of the Asian Crisis, but it was not effective to prevent the Rupiah currency from falling freely. Although some capital and foreign exchange management and controls were introduced, those measures were not introduced during the period of IMF programs (1997-2003), since the IMF in principle took negative approach towards capital

control and management[6]. During the period of the Crisis, the Government authority introduced banking regulations, and facilitated improvement in the management of financial institutions under the specialized agency (Indonesian Bank Restructuring Agency, IBRA)[7]. However, the Crisis became serious under the IMF program, which put conditionality of drastic restructuring of the banking sector, including closure of 16 commercial banks.

The policy lesson of the Crisis in Indonesia indicates that a developing country with limited foreign reserves should set limits on its foreign currency debt through capital and foreign exchange controls and management[8].

It was the post-IMF program period since 2004 that the Indonesian government introduced intensive capital control and management measures. The offshore trading of foreign exchange with Rupiah and the exchange of local currency by the residents, as well as acquisition of foreign assets and the exchange of Rupiah are now restricted (Table 1)[9].

Restrictions of SBI trading for preventing from short-term and speculative investment capital (the policy of One-Month Holding Period, OMHP) were introduced in June 2010, and additional measures including the ceiling of external borrowing and raising the reserve ratio of foreign exchange have been introduced since January 2011. Also, Bank Indonesia introduced regulations to restrict rupiah transactions and foreign currency credit by banks in January 2011.

In principle, all major transactions of foreign exchanges through offshore banks and non-banks are to be reported to the Bank Indonesia. The transactions in the domestic market are to be made by Rupiah currency in principle.

2. 3 Financial / Monetary Markets in Indonesia

The Indonesian Rupiah significantly depreciated during the Asian Crisis, caused by the contagion of the capital outflows from the Asian region triggered by the fall of Thai Baht in July 1997. The real effective exchange rate of Indonesian Rupiah depreciated by 16% until April 1997 from April 1995, and Rupiah depreciated significantly as adjustment of the real exchange rate of the currency, which appreciated significantly before the Crisis. However, the level of current account deficit of Indonesia was relatively modest with 2.5% of GDP in the pre-Asian Crisis (the 2nd quarter of 1996)[10]. Thus, the current account deficit was not the direct cause of the Crisis, but rather the contagion of the Crisis triggered by the fall of Thai Baht in July 1997. The fundamental reason, however, was that Indonesia had liberalized capital account regime that was vulnerable to the capital outflows before the Crisis. Significant outflows of capital from financial organizations as well as

Table 1: Capital and foreign exchange liberalization and controls (Indonesia)

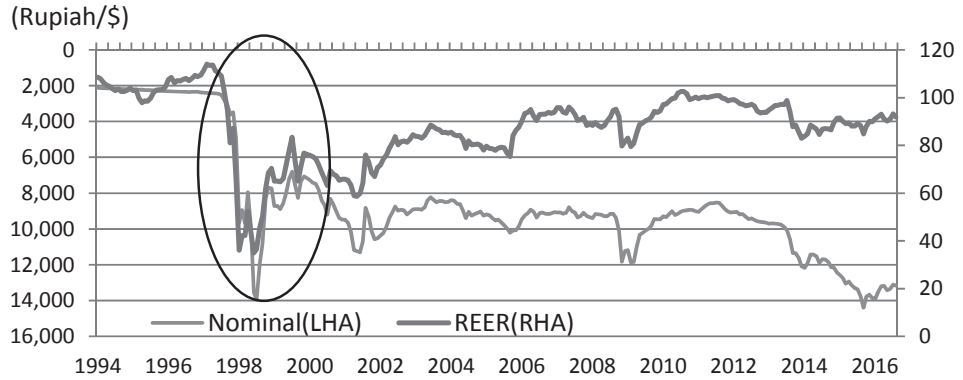
Year	
1989	Deregulation of ceiling of offshore trading by banks/financial instituions
1989	Foreign investors allowed up to 49% shares
1989	Restriction of net open position(NPO) for forex trading banks/non-banks
1991	Banks' offshore borrowing up to 20% of capital (←25%）; premium for swap for 3 months raised 5%
1991	Approval required for external borrowings by national banks/public corp.
1991	Restriction of the net open positions(NPO) for forex trading banks/non-banks
1992	Allowed foreign investors to acquire a majority of share in commercial banks
1994	Approval required for commericial banks' external borrowins
1994	Deregulation on the net open positions(NPO) for forex trading banks/non-banks
1994	Deregulation on the external commercial borrowings
1995	Restriction on the external borrowings more than 2 years; The share of capital by non-residents to be less than 30%
1996	Foreign investment in mutual funds allowed in 100% foreign owned capital
1997	Future trading of forex to be restrcted less than US$5 million
1997	Liberalization on investment in domestic shares by foreign investors (except banking sector)
1998	Deregulation of prohibited business sectors in FDI
1999	Govt approval not required for M&A
2001	Deregulation on lending of foreign currencies to non-residents by domestic banks
2001	Trading by the domestic banks prohibited;(i)Rupiah denominated overdraft; (ii)Lending to non-residents; (iii)Transactions of Rupiah-denominated bonds issued by non-residents;(iv) Rupiah trading among non-residents; (v) Investment in stocks issued by non-residents in Rupiah currency
2004	Stirct regulation on the Reserves in Rupiah in bank accounts
2004	Reporting required for offshore borrowings by financial institutions
2005	Short-term borrowings to be less than 30% of total assets; Central Bank(Bank Indonesia)'s approval required for lon-term external borrowings
2005	Reserve requirement in Bank Indonesia account raised
2005	Restrction of lending in foreign currencies to non-residents by domesitc banks
2006	Transfers of Rupiah currency to non-residents prohibited
2008	Requirement of report to the Authority on external borrowings from non-residents
2008	Ceiling of conversion of Rupiah to foreign exchange for non-residents over $100,000 monthly (requirement of special approval for over $100,000)
2008	Conversiton of Rupiah to foreign currency limited for current account transactions in principle
2010	Requirement of holding SBI(Central Bank securities) more than 1 month.
2011	Banks' offshore short-term borrowing up to 30% of capital Reserve requirement of 5 percent of total foreign-exchange holdings for Banks All transactions of Banks are to be used by Rupiah; imposed restrictions of foreign currency credit and rupiah transfers to ofshore accounts
2012	Minimum capital raised to Rp10bn for investment (all sectors), and minimum paid in capital with Rp 3bn.
2014	External Borrowings are to be withrwan at thedomesticbanks to be reported at BI. Compulsory minimum hedge ceiling for non-bank firms introduced
2015	Compulsory report on offshore tradings of non-bank firms and financial firms All the transactions(cash/non-cash) in Indonesia should be made in Rupiah currency

Note: The shaded area shows foreign exchange and capital controls/regulations
Sources: Author based on the resources of JETRO, Aramaki&Karikomi (2007), Magud&Reinhart(2006), etc.

business firms have resulted in increased external debt burden of banks and domestic firms, and the financial crisis accelerated deterioration of the economy.

The exchange rate regime in Indonesia shifted from practically dollar-pegged to more flexible regime after the Asian crisis. As a result, the real effective exchange rate has not appreciated significantly during the past decade, which could be one of the important factors that Indonesia has been able to avoid the risk of currency crisis in the past decade.

Fig.5: Nominal/Real Effective Exchange Rate (Indonesia)

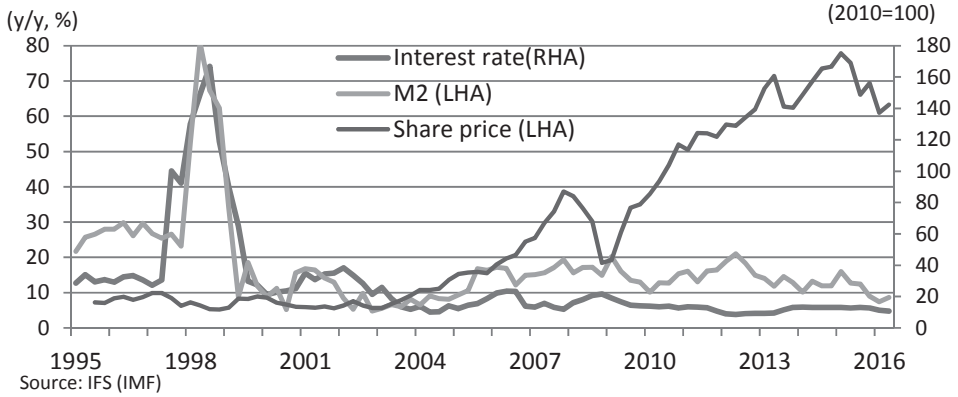


Source: IFS (IMF) , BIS (effective exchange rate indices)

Moreover, the foreign exchange and capital controls, the foreign exchange rate has made the Indonesian economy more resilient to the global market conditions, which have been volatile, especially pre- and post-global financial crisis of 2008.

The financial and capital markets have also stabilized, and the money market

Fig.6: Interest rate, M2 and Share price (Indonesia)



Source: IFS (IMF)

rate fell to the level of around 4% and stabilized during the first quarter of 2012. The share price also sharply recovered especially in the latter part of 2000s, with stabilization of the economy.It rose again after the Lehman Shock since 2011, though some external factors have affected the level of stock price.

3. Effects of Capital Inflows

3. 1 Past Studies

On the effectiveness of capital controls and management, Goh (2005) indicates that the controls not only reduce the total flows (hence increase monetary autonomy), but to some extent affected the private long-term flows, citing the experience of Malaysia in 1998. The IMF has officially endorsed capital management and controls, as described in the staff notes (see Ostry et al. 2010. 2011), which admitted the effectiveness of capital inflow controls officially for the first time as official documents by the IMF. However, as Habermeier et al. (2011) put it, the IMF has not completely authorize capital controls on outflows of capital and put more emphasis on macro-prudential measures and market based policy measures on capital management.

In the case of Indonesia, after the termination of the IMF program, the authority has strengthened the capital management and financial controls, including prudential measures. The experience of Indonesia may be evaluated from the academic point of view. As shown in this paper, the capital inflows have become limited effects on the Indonesian Economy and the market, and it could be result of the Indonesian authority's efforts to control the instability of the capital flows especially portfolio investment flows, which is shown in the paper by Bank Indonesia (Hendarsah, 2010).

There are several studies on the effect of capital inflows on economic growth in emerging and developing economies. Among the capital inflows, FDI is generally considered as one of the most important capital resources that could contribute to economic growth in several past studies. Indeed, FDI may raise economic growth in the recipient countries. However, the contribution of FDI to economic growth and expanding productive activities would depend on the circumstances in the recipient countries. Thus, several studies on the effect of FDI on the economy show inconclusive results.

Carkovic and Levine (2002), for example, argue that there is not a robust, causal link running from FDI to economic growth. Some empirical study (Alfaro, et

al., 2009, 2010) suggests that FDI could play an important role in contributing to economic growth where financial markets are developed enough; the host country benefits from backward linkages between the foreign and domestic firms. In this regard, Cipollina et al. (2011) suggest that FDI has positive and statistically significant growth effect in recipient countries during 1992-2004, and the effect is stronger in capital intensive and in technologically advanced sectors. These studies indicate FDI could contribute economic growth under certain conditions (matured financial markets, capital and technology intensive sectors, etc.).

Ghosh and Qureshi (2016) also show that while capital inflows generally lead to macroeconomic imbalances and financial vulnerabilities, as well as to a greater likelihood of banking and currency crisis, other investment and portfolio flows (especially portfolio debt flows) are the most risky, while FDI seems to be the safest type of capital inflow, based on a sample of 53 emerging economies over 1980–2013.

In the case of Indonesia, several studies indicate that FDI has limited impact on the economy in terms of economic growth. Dhanani and Hasnain (2002) found that contribution of FDI to economic growth in Indonesia is rather modest in total capital formation and development in industries, and that FDI put negative impact on the balance of payments due to the large propensity to import production inputs from the study in the late 1990s. The study by Effendi and Soemantri (2003) reveals that the effect of FDI on regional economic growth in Indonesia is relatively weak in accelerating the economic growth. These studies suggest that Indonesia may not fully utilize potential benefit of FDI for economic growth.

In terms of capital controls, Blundell-Wignall and Roulet (2014) suggested based on the panel regressions contrast with the idea that controls are most beneficial in a crisis, while there was no support for overall controls over the full sample.

This paper confirms the fact that capital inflows, including FDI, had very limited impact upon the real economy in Indonesia, and shows that capital management and controls have contributed to the stability of the economy with relatively high growth since 2004 until today. The next section will examine the effects of capital inflows on the real economy and financial, as well as foreign exchange markets, dividing the period between the pre- and post-IMF Program.

3. 2 The Effects of Capital Inflows on the Real Economy and Foreign Exchange, Monetary/Financial Markets: Panel regression

One of the major objectives of the analyses is to identify the effectiveness of

capital controls and regulations introduced after the termination of the IMF programs, to compare the period of liberalization under the IMF program during and after the Asian crisis (1994-2003) with the post-IMF program period during 2004-2016(Q1). Thus, the covered period is divided into the period 1994-2003, and the period 2004-2016(Q1). The latter period covers the period when the government authority became independent from the IMF's conditionality in economic policy, in terms of monetary and exchange controls/management to stabilize the market and the real economy. The results of regression analyses indicate that the total capital inflows (net) had significant correlation with GDP growth during1994-2003, and the FDI had positive correlation with GDP growth, while portfolio investment had negative with GDP growth.

The regression equations during the period also indicate that the Asian Crisis (Crisis dummy 1) had significantly negative impact upon the GDP growth.

Table 2: Indonesia: Capital Flows and GDP growth [1994-2016]

	【Dependent Variable: GDP growth】										
	1994-2003					2004-2016(Q1)					
【Explanatory Variables】	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(10)
Total (Net)	0.0200					0.0062					
	(0.093)					(0.045)					
	(0.214)					(0.140)					
FDI			0.4689 *				0.0867				
（% of GDP）			(0.263)				(0.119)				
			(1.785)				(0.729)				
Portfolio				-0.3104 **				-0.0467	-0.0516	-0.0587	
（% of GDP）				(0.125)				(0.067)	(0.062)	(0.061)	
				(-2.479)				(-0.696)	(-0.826)	(-0.963)	
Others					0.2835 *						0.0430
（% of GDP）					(0.162)						(0.053)
					(1.745)						(0.812)
REER		0.1332 ***							0.047 ***		
		(0.031)							(0.016)		
		(4.263)							(2.865)		
M2 (log)				-14.934 **	-16.385 ***			-0.441			
				(3.002)	(2.776)			(0.522)			
				(-4.975)	(-5.902)			(-0.845)			
Interest Rate					-0.1717	0.0861	0.0975		-0.004		
(money market rate)					(0.105)	(0.094)	(0.091)		(0.066)		
					(-1.638)	(0.921)	(1.071)		(-0.057)		
Mfg.Production	0.1783 ***		0.1716 ***	0.0589		0.0377	0.0621				
	(0.048)		(0.046)	(0.043)		(0.033)	(0.038)				
	(3.695)		(3.710)	(1.375)		(1.154)	(1.640)				
Non-durable Mfg	0.0423	0.0148	0.0326	-0.0310	-0.045	0.0013		0.0017		0.0016	0.0015
	(0.043)	(0.041)	(0.042)	(0.035)	(0.037)	(0.001)		(0.001)		(0.001)	(0.001)
	(0.980)	(0.361)	(0.784)	(-0.878)	(-1.221)	(0.890)		(1.153)		(1.230)	(1.093)
Oil Prices				0.5459 ***	0.6968 ***					0.0124 ***	
				(0.158)	(0.150)					(0.004)	
				(3.461)	(4.658)					(3.168)	
Crisis dummy	-8.732 ***	-9.909 ***	-9.038 ***	-8.183 ***	-5.777 ***						
(1997/8)	(2.029)	(1.625)	(1.826)	(1.908)	(1.884)						
	-4.3029	-6.0991	-4.9496	-4.2888	-3.066						
Crisis dummy						-0.4327	-0.6291			-0.5444	-0.5243
(2008/9)						(0.427)	(0.448)			(0.386)	(0.402)
						(-1.014)	(-1.405)			(-1.410)	(-1.304)
Constant	4.175 ***	-5.946 *	4.097 ***	77.511 ***	82.792 ***	5.457 ***	4.708 ***	8.421 **	1.420	4.699 ***	5.645 ***
	(0.77)	(2.83)	(0.74)	(14.45)	(13.28)	(0.181)	(0.662)	(3.300)	(1.623)	(0.324)	(0.125)
	(5.407)	(-2.104)	(5.529)	(5.362)	(6.235)	(30.17)	(7.115)	(2.552)	(0.875)	(14.48)	(45.17)
R^2	0.7273	0.7467	0.7497	0.8551	0.8289	0.0956	0.1106	0.0565	0.1729	0.2163	0.0810
Obs.	40					49					

Notes 1. Each capital flow variable (Total. FDI, Portfolio, Other investment) are as percentage of GDP
2. Period is between 1994Q1 and 2015Q3.
3. Figures in parentheses are standard deviation (upper) and t-value (lower).
Sources: Author's calculation based on database of IFS (IMF) and Bank Indonesia

On the other hand, capital inflows are not statistically correlated with the real economy (GDP growth and manufacturing production) during 2004-2016 (Q1). During the period, real effective exchange rate (REER) and oil price only had significantly positive correlation with GDP growth. It should be also noted that the Global Financial Crisis (Crisis dummy 2) did not have any significant impact on the GDP growth during the period. It could indicate that capital management and controls introduced during the period might have worked to stabilize the economy and the market in Indonesia.

The regression results show the fact that the real economy (GDP growth) has become more independent from the external capital flows since 2004, as compared with the period 1994-2003.

3. 3 Analysis: Vector Autoregressive Regression (VAR) / Bayesian VAR (BVAR) models

This section is devoted to an analysis of the effects of capital controls on the stability in the market and the real economy over the period 1994-2016(Q1) through the changes in the response of the shocks of capital inflows (Total, FDI, portfolio, other investment) based on the Vector auto regression (VAR) and Bayesian VAR (BVAR) models.

The impulse response functions based on the VAR model are used to produce the time path of the dependent variables in the VAR, to shocks from all the explanatory variables. This study estimated the effects of capital inflows on the monetary and financial as well as the real economy in Indonesia based on VAR models comprising GDP growth rate, financial market indicators (money market rate, money stock [M2]), foreign exchange market (real effective exchange rate), foreign exchange reserves, manufacturing production index, BVAR method could be used to estimate the response to some shock variables with not sufficient variables, which would be the case in point (as quarterly data). The difference with standard VAR models lies in the fact that the model parameters are treated as random variables, and prior probabilities are assigned to them.

The VAR models in the analysis are classified into the real sector analysis and the financial market, and the former model includes variables of capital flows (Total, FDI, portfolio, other investment; quarterly, percent of GDP), GDP growth [quarterly, y/y], as well as manufacturing. Since the Indonesian economy has been affected significantly by oil/natural gas prices, the variables of manufacturing sectors are divided into two variables: total manufacturing and nondurable manufacturing [including oil/gas sectors]).

The other model includes those variables of capital flows (Total, FDI, portfolio, other investment), the real effective exchange rate [REER], as well the monetary/financial sectors respectively. Accordingly, the general equations of VAR model are as follows:

$$\begin{pmatrix} y^{1}{}_{t} \\ y^{2}{}_{t} \\ y^{3}{}_{t} \\ y^{4}{}_{t} \end{pmatrix} = \begin{pmatrix} \alpha_1 \\ \alpha_2 \\ \alpha_3 \\ \alpha_4 \end{pmatrix} + \sum \begin{pmatrix} \beta_1 \gamma_1 \chi_1 \psi_1 \omega_1 \\ \beta_2 \gamma_2 \chi_2 \psi_2 \omega_2 \\ \beta_3 \gamma_3 \chi_3 \psi_3 \omega_3 \\ \beta_4 \gamma_4 \chi_4 \psi_4 \omega_4 \end{pmatrix} \begin{pmatrix} y^{1}{}_{t-j} \\ y^{2}{}_{t-j} \\ y^{3}{}_{t-j} \\ y^{4}{}_{t-j} \end{pmatrix} + \begin{pmatrix} u_1 \\ u_2 \\ u_3 \\ u_4 \end{pmatrix} \quad (1)$$

Where the explanatory variables of the regressions (indicated below) are included as y^1 (t-j indicates the previous period of t).

Variables of capital inflows, namely (i) Total capital inflows (net) of the previous quarter (Total); (ii)Foreign direct investment inflows (net and gross) of the previous quarter (FDI); (iii) Portfolio inflows (net) (Portfolio); (iv) Other investment inflows (Other) are included in the first column of the VAR model.

The variables of the vector in the second and other columns could be any of the following variables: (a) GDP growth rate, (b) manufacturing (total), (c) nondurable manufacturing (including oil/gas and mineral related sectors), (d) real effective exchange rate, (e) money stocks (M2), (f) money market rate, and (g) foreign reserves. There are two models involved in the analysis as follows[11]:

The first model includes those variables of any of the capital inflow variables (Total, FDI, portfolio, other investment) and the real sector of the economy: GDP growth rate; total manufacturing production; nondurable manufacturing production (incl. oil and other mineral sector)

(i) Capital inflows (Total; FDI; Portfolio; Other investment) (quarterly, percent of GDP)

(ii) Manufacturing Production: Changes in total manufacturing production (y/y) [VAR]
Index (2010=100) [Bayesian VAR]

(iii) Nondurable manufacturing (incl. oil/energy sector) production (y/y) (same as (ii))

(iv) Real GDP Growth (y/y) [VAR]; (Index, 2010=100) [BVAR] As an example, the VAR model including total capital flows is shown as follows:

$$\begin{pmatrix} \text{Total}_t \\ \text{Mfg}_t \\ \text{NDMfg} \\ \text{GDP}_t \end{pmatrix} = \begin{pmatrix} \alpha_1 \\ \alpha_2 \\ \alpha_3 \\ \alpha_4 \end{pmatrix} + \sum \begin{pmatrix} \beta_1 & \gamma_1 & \chi_1 & \psi_1 \\ \beta_2 & \gamma_2 & \chi_2 & \psi_2 \\ \beta_3 & \gamma_3 & \chi_3 & \psi_3 \\ \beta_4 & \gamma_4 & \chi_4 & \psi_4 \end{pmatrix} \begin{pmatrix} \text{Total}_{t-j} \\ \text{Mfg}_{t-j} \\ \text{NDMfg}_{t-j} \\ \text{GDP}_{t-j} \end{pmatrix} + \begin{pmatrix} u_1 \\ u_2 \\ u_3 \\ u_2 \end{pmatrix} \tag{2}$$

The second model includes those variables of any of the capital inflow variables (Total, FDI, portfolio, other investment), and financial/monetary/foreign exchange markets: real effective exchange rate; money stocks (M2); interest rate (money market rate); and Share prices as follows:

(i) Capital inflows (Total; FDI; Portfolio; Other investment) (quarterly, percent of GDP)
(ii) Real effective exchange rate (REER) (Index)
(iii) Money stocks : M2 (log)
(iv) Money market rate (Intrate)
(v) Share prices: Share(Index)

From the above specifications, the VAR model entails 4 times of the equation (3), which has one of the variables other than capital inflow variables. For example, the equation on the Model 2, including Total and the exogenous shock to the other variables, is as follows:

The VAR model including total capital flows sis as follows:

$$\begin{pmatrix} \text{Total}_t \\ \text{REER}_t \\ \text{M2}_t \\ \text{Intrate}_t \\ \text{Share}_t \end{pmatrix} = \begin{pmatrix} \alpha_1 \\ \alpha_2 \\ \alpha_3 \\ \alpha_4 \\ \alpha_5 \end{pmatrix} + \sum \begin{pmatrix} \beta_1 & \gamma_1 & \chi_1 & \psi_1 & \omega_1 \\ \beta_2 & \gamma_2 & \chi_2 & \psi_2 & \omega_2 \\ \beta_3 & \gamma_3 & \chi_3 & \psi_3 & \omega_3 \\ \beta_4 & \gamma_4 & \chi_4 & \psi_4 & \omega_4 \\ \beta_5 & \gamma_5 & \chi_5 & \psi_5 & \omega_5 \end{pmatrix} \begin{pmatrix} \text{Total}_{t-j} \\ \text{REER}_{t-j} \\ \text{M2}_{t-j} \\ \text{Intrate}_{t-j} \\ \text{Share}_{t-j} \end{pmatrix} + \begin{pmatrix} u_1 \\ u_2 \\ u_3 \\ u_4 \\ u_5 \end{pmatrix} \tag{3}$$

3.4.1 ADF test and Stationarity-y

Prior to the analysis based on the VAR model stationarity of the variables involved in the regression is tested by ADF (augmented Dickey-Fuller) method for the unit root tests (Table 2).

Capital inflow variables (Total, FDI, portfolio, and other investment), manufacturing (total and nondurable) production (y/y), as well as GDP growth (for the period 2004-2016Q1) has unit root without first lag. However, the ADF test results show that unit root is not rejected with level for GDP growth (1994-2003) and FDI (1994-2003), so that unit root is rejected for the first lag of each variable, which is

expressed as I (1)[12]. It should be noted that stationarity of some economic indicators (GDP growth rate, FDI, REER, share) was not kept without first lag during the period 1994-2003, covering the Asian Crisis period (1997/8). For other variables, the stationarity is confirmed with level, except the variables of REER, LogM2 and Interest rate (Intrate), which are confirmed stationarity with first lag of variables during the whole period (1994-2016Q1).

Table 3: Augumented Dickey-Fuller (ADF)Test (Indoensia)

	1994-2003						2004-2016(Q1)					
	level	p	lag	1st	p	lag	level	p	lag	1st	p	lag
GDP	-2.76	0.07	(1)	-4.35	0.001	(0) ***	-3.43	0.001	(0) **	-8.29	0.000	(0) ***
(y/y, %)	-2.66	0.26	(1)	-4.34	0.007	(0) ***	-0.39	0.108	(0) **	-8.34	0.000	(0) ***
Total	-3.40	0.02	(0) **	-6.54	0.000	(1) ***	-3.45	0.014	(1) **	-13.73	0.000	(0) ***
(% o fGDP)	-3.49	0.05	(0) *	-6.48	0.000	(1) ***	-7.41	0.000	(0) ***	-13.62	0.000	(0) ***
FDI	-2.19	0.21	(0)	-8.87	0.000	(0) ***	-5.11	0.000	(0) ***	-5.35	0.000	(0) ***
(% o fGDP)	-2.72	0.24	(0)	-8.75	0.000	(0) ***	-5.84	0.000	(0) ***	-5.37	0.000	(0) ***
Portfolio	-5.11	0.00	(0) ***	-6.72	0.000	(2) ***	-6.21	0.000	(0) ***	-7.97	0.000	(2) ***
(% o fGDP)	-5.09	0.00	(0) ***	-6.67	0.000	(2) ***	-6.22	0.000	(0) ***	-7.87	0.000	(2) ***
Other	-3.91	0.00	(0) ***	-8.35	0.000	(0) ***	-6.68	0.000	(0) ***	-7.12	0.000	(2) ***
(% o fGDP)	-3.87	0.02	(0) **	-8.23	0.000	(0) ***	-7.50	0.000	(0) ***	-7.03	0.000	(2) ***
REER	-2.13	0.23	(1)	-4.35	0.001	(0) ***	-1.85	0.350	(0)	-5.48	0.000	(0) ***
[Index]	-2.21	0.47	(1)	-4.33	0.008	(0) **	-1.78	0.701	(0)	-5.48	0.000	(0) ***
M2（log)	-2.11	0.24	(0)	-4.63	0.001	(0) ***	-2.49	0.124	(4)	-2.90	0.053	(3) *
	-0.37	0.99	(0)	-5.12	0.001	(0) ***	-0.36	0.986	(4) *	-3.72	0.031	(3) **
IntRate	-9.40	0.00	(4) ***	-3.43	0.021	(3) **	-2.04	0.270	(0)	-3.65	0.008	(2) ***
(JIBOR)	-2.75	0.23	(3)	-4.87	0.002	(0) **	-3.68	0.034	(1) **	-3.63	0.039	(2) **
Share	-2.67	0.09	(1) *	-4.37	0.002	(0) ***	-1.18	0.677	(0)	-5.75	0.000	(0) ***
[2005=100]	-2.19	0.47	(1)	-4.34	0.009	(0) ***	-1.71	0.732	(0)	-5.76	0.000	(0) ***
Mfg	-5.22	0.00	(0) ***	-5.28	0.000	(0) ***	-3.93	0.004	(0) ***	-7.07	0.000	(3) ***
(y/y)	-4.50	0.01	(3) ***	-5.22	0.001	(0) ***	-4.74	0.002	(7) ***	-7.01	0.000	(3) ***
Nondurable	-6.10	0.00	(0) ***	-9.92	0.000	(0) ***	-6.64	0.000	(0) ***	-7.88	0.000	(1) ***
MFG(y/y)	-6.00	0.00	(0) ***	-9.77	0.000	(0) ***	-6.57	0.000	(0) ***	-7.79	0.000	(1) ***

Notes 1 Upper: Cnstant; Lower: Constant and Trend 2 ***, **, * denotes significance at 1%, 5%, and 10%, respectively.
3. Real Effective Exchange Rate（REER), Foreign Reserves (log). Quarterly Figures.
4.Nondurable: Nondurable Manufacturing indusry (incl. oil, coal and other energy related sectors)
Sources: Author's calculation based on the data of International Financial Statistics (IMF)、BIS(REER)

3. 4. 2 Granger Causality Test

Granger causality tests are essentially those measures to improve in forecasting association and correlation between the variables. By using an F-test to jointly test for the significance of the lags on the explanatory variables, this in effect tests for 'Granger causality' between these variables[13].

This section focuses on the causality between the variables of capital inflows and foreign exchange rates, monetary and financial markets, as well as the real economy (real GDP growth rate, manufacturing production) based on the quarterly data through VAR model. The analysis is based on the quarterly data of each

variable during the period1994-2016Q1, dividing 1994-2003, and 2004-2016Q1, and the latter period is also divided into the pre-Global Financial Crisis (2004-2008Q2) and the post Global Financial Crisis (2008Q3-2016Q1) to verify the effects of changes in capital inflows in each period. In Indonesia, capital flow management and controls were not significantly introduced, especially under the IMF program continued between 1994 and 2003.

The results of Granger Causality test of each variable, with the average of the first, 2nd, 3rd and 4th (quarter) lags are summarized in Table4.

Table 4: Granger Causality (Indonesia) [1994-2016(Q1)]

1994-2003	GDP	Total	FDI	Portfolio	Other	REER	M2	Intrate	Share	Mfg	NdMFG
GDP		0.380	0.428	0.775	0.165	2.625 *	17.80 ***	2.154	0.587	1.841	1.878
Total	3.093 ***		0.842	0.838	6.286 ***	1.120	26.54 ***	2.262	2.093	4.683 **	0.031
FDI	3.343 *	0.425		0.607	2.207	0.886	6.664 **	0.613	0.666	2.860 *	0.842
Portfolio	1.950	0.197	0.175		10.13 ***	1.326	21.47 ***	1.989	1.375	3.226 *	0.315
Other	5.162 ***	0.149	0.549	0.759		2.328	4.089 **	1.815	1.643	3.974 **	0.462
REER	13.58 ***	0.493	0.313	1.023	14.51 ***		12.71 ***	3.283 *	1.973	4.899 **	0.870
M2 (log)	2.115	0.202	0.796	0.368	8.308 ***	1.038		4.502 **	0.679	2.257	0.540
Interest rate	15.82 ***	4.652 **	0.815	9.171 ***	3.030 **	3.706 **	2.132		5.742 ***	3.278 **	2.027
Share	0.799	6.025 ***	1.253	4.792 **	3.314	2.625 *	1.799	0.505		1.494	0.489
Manufacturing	3.535 **	2.086	2.390	0.777	0.510	2.259	0.970	5.041 *	2.539 *		1.648
NdMfg	0.558	0.053	0.546	0.171	0.881	0.079	0.597	0.179	0.334	0.390	
2004-2008(Q2)	GDP	Total	FDI	Portfolio	Other	REER	M2	Intrate	Share	Mfg	NdMFG
GDP		0.972	2.068	2.297	1.129	0.675	1.764	1.908	0.186	1.049	4.836 **
Total	1.225		0.645	1.605	0.502	12.01 ***	1.456	0.679	0.584	0.830	0.332
FDI	1.683	4.568 **		1.311	5.391 **	4.759 **	2.750 *	0.273	0.102	2.904 *	0.836
Portfolio	0.409	1.523	0.277		0.951	0.878	0.376	0.501	0.534	0.637	1.656
Other	3.696 **	0.068	0.511	3.652 **		4.257 **	1.563	0.866	0.213	5.463 **	0.407
REER	0.593	1.619	0.272	1.691	0.304		2.326	1.899	0.424	0.758	0.407
M2 (log)	0.240	2.954 *	0.675	0.439	0.542	2.463 *		0.231	0.220	0.049	1.357
Interest rate	2.215	0.491	0.118	1.226	3.034 *	0.606	0.069		0.380	1.116	0.364
Share	1.717	0.318	0.206	1.879	0.646	1.419	0.623	0.171		2.825 *	3.481 *
Manufacturing	6.037 ***	0.370	0.742	0.436	0.670	1.607	1.311	2.283	1.340		0.310
NdMfg	1.077	4.214 **	2.477 *	1.145	1.847	37.80 ***	0.869	0.348	1.359	1.256	
2008-2016(Q1)	GDP	Total	FDI	Portfolio	Other	REER	M2	Intrate	Share	Mfg	NdMFG
GDP		0.333	0.975	1.945	2.031	2.673 *	1.879	1.818	0.283	0.508	7.165 ***
Total	0.978		1.860	0.548	1.320	0.643	0.425	1.863	0.462	2.749 *	0.230
FDI	1.614	1.783		1.482	8.762	1.712	0.631	2.174	0.755	0.978	0.801
Portfolio	1.592	0.723	2.227		1.292	0.747	0.357	2.751 *	0.450	1.502	0.964
Other	1.676	0.917	0.588	0.865		1.287	0.794	0.809	0.493	0.900	0.743
REER	4.372 **	0.269	0.197	0.597	0.264		0.762	0.350	1.151	0.689	1.719
M2 (log)	1.262	1.040	0.284	0.411	1.491	0.384		1.294	0.457	0.791	1.499
Interest rate	2.351	2.406	3.724 **	0.553	2.696 *	2.685 *	0.874		0.472	4.290 **	0.341
Share	1.668	0.818	1.436	0.335	1.306	1.530	1.260	1.864		1.273	0.566
Manufacturing	0.676	1.286	0.454	0.084	0.659	2.509 *	0.328	0.759	1.337		0.680
NdMfg	1.330	1.007	0.936	0.535	1.064	0.527	0.718	1.467	0.674	1.534	

Notes 1 GDP: real GDP growth (%, y/y); Capital Inflows (Total, FDI, Portfolio, Other): % of GDP;
Real Effective Exchange Rate (REER: 2010=100); money market rate for 'interst rate';
Share (Jakarta Stock Exchange Index, 2005=100); Manufacturing (y-o-y, %); NdMFG: NonDurable Manufacturing (y-o-y, %)
2 The period is from 1994Q1to 2016 Q1
3 Lags are average of 1st to 4th order (quarterly).
4 Figures are F-value. ***, **, * denotes significance at 1%, 5%, and 10%, respectively.
Sources: Author's calculation based on International Financial Statistics (IFS) database(IMF); BIS (Real Effective Exchange Rate

The variables involved in the analysis include quarterly figures of net capital inflows (Total, FDI, portfolio investment, and other investment) [percent of GDP], real effective exchange rates (REER [index]), money stocks (M2), money market rate (Interest rate or Intrate), manufacturing production (the whole sector [Mfg]

and nondurable manufacturing [NdMfg]) indices (year-on-year growth). This is in accordance with the results of ADF (Augmented Dickey-Fuller) tests of each variable. The figures show that the validity of variables of left column causes the variable of right column.

The overall capital inflows, especially short-term capital flows (portfolio/ other investment had significant causality with both real economy (GDP growth, manufacturing production) and the financial and monetary sector during 1994-2003. The total capital inflows Granger cause the GDP growth, manufacturing (Mfg), and money stocks (M2) during 1994-2003. FDI has Granger cause relationship with M2 but not with (total) manufacturing production, while portfolio and other investment not only Granger cause interest rate but also M2 significantly during the 1994-2003. Significant impact of interest rate (money market rate) on the real economy is also observed, since it Granger causes GDP growth rate, manufacturing production, as well as REER, through short-term capital flows (portfolio/ other investments) during 1994-2003. The overall impact of the capital flows on the real economy and markets are significant under the free capital flow regime during the period.

On the other hand, Granger causality between the capital inflows and the market significantly weakened during the period 2004-2016(Q1).

The capital inflows during 2004-2008 Q2 (before the Lehman Shock), capital inflows had significant causality with REER. In general, capital inflows had significant impact upon productive activities during the period. The FDI and other capital inflows also Granger caused manufacturing production during the period. It should be also noted that among the capital inflow variables, other investment Granger causes manufacturing significantly during 2004-2008 Q2, when the market was in 'bubble' situation under the abundant global liquidity with carry trade globally.

However, causality between capital flows and domestic market has become insignificant since 2008 Q3, after the 'Lehman Shock' followed by the Global Financial Crisis. The domestic market has become more in line with fundamental causality between interest rate and GDP growth. This indicates that normal mechanism in the financial sector has become worked: interest rate would cause manufacturing production and also FDI which has been one of the major forces productive activities in Indonesia.

It shows that the overall effects of capital as well as foreign exchange management and controls effectively contributed to such a significant change in the granger causality between the capital flows and the real economy and markets in Indonesia from 2008 Q3 to 2016 Q1.

The above Granger causality tests show that the impact of capital flows on the real economy as well as monetary/financial markets has become insignificant, and that the real and monetary/ financial sectors have much more independent with the capital inflows since 2004. This trend is also observed by the regression based analysis, as shown in the following sections.

3.5 Variance decomposition

The variance decomposition of GDP growth based on the VAR model is shown in Table 5-1(VAR) and 5-2 (BVAR). The overall results of VAR and BVAR share similar trends of decreasing the impact of capital flows on the real economy (GDP growth).

The share of the decomposition of GDP growth during 1994-2003 indicates that net capital flows had significant influence on the growth during the period. Particularly, the shares of short-term capital flows (portfolio and other investment) are very high as compared with that of FDI

However, the share of all the capital flows, especially portfolio and other capital flows, significantly declined during 2004-2016 both in the VAR and BVAR models (Table 5-1, 5-2),

Thus, the overall results of variance decomposition with regard to GDP growth indicates that short-term (portfolio/other) investment have decreased significantly in in its share in the decomposition of economic growth since 2004, and the FDI has become less important component for GDP growth recently.

The changes in the variance decomposition of VAR analyses indicate that GDP growth has become more dependent on the domestic factors, rather than capital inflows in the decades. This would also suggest that *the termination of the IMF program* has had some favourable effect on the real economy in terms of less dependence on the short-term capital flows in Indonesia.

Table 5-1: Variance Decomposition of GDP growth (Indonesia) [VAR]

	1994-2003				2004-2016 (Q1)			
Period	**Total**	MFG	NDMFG	GDP	**Total**	MFG	NDMFG	GDP
1	0.475	9.135	5.449	84.942	0.419	3.991	10.186	85.403
2	7.153	7.958	4.606	80.283	1.731	5.977	11.951	80.342
3	10.079	9.106	4.363	76.452	2.848	7.445	12.011	77.695
4	10.307	10.163	4.296	75.234	3.541	8.267	11.856	76.336
5	10.256	10.629	4.272	74.844	3.892	8.653	11.754	75.701
6	10.394	10.739	4.254	74.613	4.047	8.814	11.707	75.432
7	10.568	10.735	4.243	74.454	4.108	8.875	11.689	75.328
8	10.676	10.721	4.237	74.366	4.131	8.897	11.682	75.290
9	10.721	10.716	4.235	74.328	4.138	8.904	11.680	75.278
10	10.733	10.717	4.234	74.316	4.141	8.906	11.680	75.274
Period	FDI	MFG	NDMFG	GDP	FDI	MFG	NDMFG	GDP
1	3.860	10.222	1.789	84.128	0.559	4.853	11.058	83.530
2	9.352	8.455	1.514	80.679	1.692	7.769	12.775	77.763
3	9.380	8.756	1.485	80.378	2.327	9.588	12.608	75.478
4	9.327	9.277	1.476	79.920	2.658	10.458	12.378	74.507
5	9.374	9.604	1.468	79.554	2.810	10.807	12.269	74.114
6	9.372	9.726	1.464	79.438	2.872	10.931	12.228	73.969
7	9.377	9.761	1.462	79.399	2.895	10.971	12.215	73.919
8	9.378	9.769	1.462	79.392	2.903	10.984	12.210	73.903
9	9.378	9.770	1.462	79.391	2.905	10.988	12.209	73.898
10	9.378	9.770	1.462	79.391	2.906	10.989	12.209	73.897
Period	**PORT**	MFG	NDMFG	GDP	**PORT**	MFG	NDMFG	GDP
1	2.253	11.526	6.802	79.419	0.056	5.230	10.596	84.119
2	5.109	9.814	5.815	79.261	0.182	7.926	12.416	79.476
3	5.742	10.213	5.754	78.290	0.296	10.054	12.315	77.335
4	5.702	10.845	5.723	77.730	0.334	11.281	12.074	76.310
5	5.765	11.144	5.691	77.401	0.344	11.864	11.941	75.852
6	5.862	11.223	5.675	77.240	0.346	12.108	11.885	75.662
7	5.919	11.232	5.670	77.179	0.346	12.203	11.863	75.588
8	5.940	11.230	5.669	77.161	0.346	12.238	11.856	75.560
9	5.945	11.229	5.669	77.157	0.346	12.251	11.853	75.550
10	5.946	11.229	5.669	77.156	0.346	12.256	11.852	75.546
Period	**OTHER**	MFG	NDMFG	GDP	**OTHER**	MFG	NDMFG	GDP
1	14.853	2.515	10.722	71.910	1.452	2.711	10.651	85.186
2	28.384	3.936	9.101	58.579	4.665	4.233	12.136	78.966
3	28.992	4.945	9.028	57.034	6.216	5.167	12.197	76.420
4	28.877	5.318	9.013	56.792	6.992	5.609	12.067	75.332
5	28.958	5.427	8.986	56.628	7.333	5.785	11.992	74.890
6	29.055	5.452	8.969	56.523	7.464	5.848	11.962	74.727
7	29.111	5.456	8.962	56.472	7.509	5.869	11.951	74.670
8	29.134	5.456	8.959	56.451	7.525	5.876	11.948	74.651
9	29.142	5.455	8.958	56.444	7.530	5.879	11.947	74.645
10	29.145	5.455	8.958	56.442	7.531	5.879	11.946	74.643

Note：1 Standard errors are not shown in the table. 2 The period for 1994-2016Q1

Sources: Author's calculation based on the data of International Financial Statistics(IMF), Bank Indonesia

Table 5-2: Variance Decomposition of GDP growth (Indonesia) [BVAR]

	1994-2003				2004-2016 (Q1)			
Period	**Total**	MFG	NDMFG	GDP	**Total**	MFG	NDMFG	GDP
1	4.930	43.096	1.245	50.729	2.217	4.162	1.665	91.956
2	8.377	47.750	2.912	40.962	1.674	11.607	2.233	84.487
3	9.353	47.699	3.947	39.000	1.524	15.434	2.169	80.873
4	9.590	47.559	4.407	38.443	1.456	17.598	2.102	78.844
5	9.649	47.498	4.585	38.268	1.416	18.954	2.055	77.575
6	9.665	47.475	4.650	38.211	1.390	19.874	2.023	76.714
7	9.669	47.467	4.672	38.192	1.370	20.536	1.999	76.095
8	9.671	47.464	4.680	38.186	1.356	21.035	1.981	75.628
9	9.671	47.463	4.682	38.184	1.345	21.423	1.968	75.265
10	9.671	47.463	4.683	38.183	1.336	21.733	1.957	74.975
Period	FDI	MFG	NDMFG	GDP	FDI	MFG	NDMFG	GDP
1	1.761	54.683	3.501	40.054	1.725	6.433	1.172	90.670
2	1.754	59.878	5.047	33.322	1.860	15.022	1.589	81.528
3	1.786	60.061	5.771	32.382	1.801	19.491	1.469	77.238
4	1.789	60.049	6.003	32.159	1.746	22.019	1.376	74.859
5	1.788	60.040	6.072	32.100	1.708	23.596	1.315	73.380
6	1.787	60.037	6.091	32.084	1.682	24.663	1.273	72.381
7	1.787	60.036	6.097	32.080	1.664	25.429	1.243	71.664
8	1.787	60.036	6.098	32.079	1.650	26.005	1.221	71.125
9	1.787	60.036	6.099	32.079	1.639	26.453	1.203	70.706
10	1.787	60.036	6.099	32.078	1.630	26.810	1.189	70.371
Period	**PORT**	MFG	NDMFG	GDP	**PORT**	MFG	NDMFG	GDP
1	2.282	47.668	1.954	48.095	0.049	4.918	1.153	93.879
2	5.885	52.350	2.710	39.055	0.053	12.876	1.574	85.497
3	6.555	52.677	3.242	37.526	0.057	17.152	1.487	81.303
4	6.678	52.696	3.472	37.154	0.057	19.588	1.410	78.944
5	6.703	52.691	3.555	37.051	0.057	21.112	1.358	77.474
6	6.708	52.687	3.582	37.023	0.056	22.144	1.322	76.478
7	6.710	52.686	3.590	37.014	0.056	22.886	1.296	75.762
8	6.710	52.685	3.593	37.012	0.056	23.444	1.277	75.223
9	6.710	52.685	3.593	37.011	0.056	23.879	1.261	74.804
10	6.710	52.685	3.594	37.011	0.055	24.226	1.249	74.469
Period	**OTHER**	MFG	NDMFG	GDP	**OTHER**	MFG	NDMFG	GDP
1	12.592	44.775	0.520	42.113	7.009	5.098	2.429	85.464
2	13.717	47.995	2.456	35.832	6.925	11.697	3.229	78.149
3	14.160	47.607	3.814	34.419	6.840	15.279	3.153	74.729
4	14.268	47.306	4.438	33.988	6.783	17.321	3.065	72.832
5	14.293	47.180	4.678	33.850	6.746	18.597	3.003	71.654
6	14.299	47.134	4.762	33.805	6.721	19.460	2.961	70.858
7	14.301	47.118	4.790	33.791	6.703	20.080	2.931	70.287
8	14.301	47.113	4.800	33.786	6.689	20.545	2.908	69.858
9	14.301	47.112	4.803	33.785	6.678	20.907	2.890	69.525
10	14.301	47.111	4.803	33.784	6.670	21.195	2.876	69.259

Note：1 Standard errors are not shown in the table. 2 The period for 1994-2016Q1
Sources: Author's calculation based on the data of International Financial Statistics(IMF), Bank Indonesia

3. 6 Impulse Response Functions

In order to confirm the above tentative results, impulse response functions through VAR (vector autoregressive) model will be used to identify the effects of increase in the capital inflows (Total, FDI, portfolio, Other investment) and that of the policy changes of capital controls on the real economy, as well as the financial/ monetary markets and in Indonesia during 1994-2011. The variables include: i) GDP growth rate; ii) Manufacturing production (the whole sector [Mfg] and nondurable manufacturing [Nondurable Mfg]); iii) Real effective exchange rate (REER) ; iv) Money stock (M2) ; v) Interest rate (money market rate); VI) Share prices (Share).

The period is divided into two periods: the period 1994-2003, which covers the period of Asian Crisis under the IMF program, and the period of Post-IMF program during 2004-2016Q1, in order to study the difference between the two periods, in terms of independence of the policy on the real economy as well as financial/ monetary sectors. To test the accumulated effects of the capital inflows, accumulated impulse response functions are presented in the VAR models.

Two models are examined as follows:

(i) Capital inflow variables (Total/FDI/Portfolio/Other investment), manufacturing (total and nondurable, including oil/gas sector), and GDP growth;

(ii) Capital inflow variables, real effective exchange rate (REER); money stocks (M2); interest rate (money market rate [Intrate]), and share price (Share).

In the first model, the effects of capital flows on the real economy, including GDP growth and manufacturing production are analysed. The manufacturing sectors are divided into total (including durable manufacturing) and nondurable manufacturing sectors (incl. Petroleum and Coal Products, Crude Petroleum Products), which is classified by the International Financial Statistics (IFS) database of IMF. It should be noted that the effects of capital inflows on the manufacturing industry are different between the sectors, especially durable and nondurable manufacturing industries; the latter includes the energy sector, which is important for the Indonesian economy.

The second model includes foreign exchange rate (REER) and financial markets (M2; interest rate; share prices), to examine the effects of capital inflows on the markets.

The two most common methods for estimating the optimal lag length for the VAR model are the Akaike and Schwarz information criterion (SBC, or the

Bayesian information criterion [BIC]). The analysis of VAR in this paper is based on the SBC, since the impulse response functions with SBC generally require shorter lags than that of AIC.

The other VAR model is Bayesian vector auto regression (BVAR) which uses Bayesian methods to estimate a vector auto regression (VAR) where parameters are treated as random variables, and prior probabilities are assigned to them. BVAR method could be used to estimate the response to some shock variables with not sufficient variables, which would be the case in point in the analysis is based on the as quarterly data.

In the following analysis, BVAR is also used together with VAR. In the impulse response functions are analysed by the VAR and BVAR in the following sub-sections.

3.6.1 Effects on the Real economy

In the first model, including variables of GDP growth and manufacturing sector, the impulse response functions, are used to show clearly the magnitude of impact upon the real sector, while the second model including variables of financial/ monetary markets utilizes ordinary impulse response functions, in order to indicate duration of the effects of external shocks.

The order of the variables in the second model is determined in accordance with the possible sequencing of results relating to capital inflows. The order of each variable in the model is based on the following sequences of capital inflows and the monetary authority's operations:

The followings are the results of impulse response functions of each variable, which may or may not be realized in such a reasoning stated above.

(a) Response of Real GDP Growth

The impulse response function of GDP growth to net capital flows changed significantly from the period 1994-2003 to 2004-2016(Q1) in terms of the standard deviation of the response function, where the response is much smaller in the latter period, capital flows has successfully constrained by the capital controls and management (Table 6). This means that the impact of capital flows on the real GDP growth has become smaller since 2004, and this result is broadly in line with the results of the granger causality and variance composition of VAR presented in the former section. At the same time, the results generally indicate 'pro-cyclical' nature of capital flows on the real economy during 1994-2003 has become less significant since 2004.

While the response function of GDP growth had positively responded to the total capital inflows significantly during 1994-2003, it became insignificant during 2008-2016Q1. This could show that several measures for capital management/ controls have been successful to avoid pro-cyclical nature of capital flows that are caused by short-term capital investment. The response to FDI and other investment became smaller and insignificant during the period 2004-2016(Q1) (Table 5, Fig.7-3). In the case of Indonesia, external borrowings (other capital inflows) have always been major resources for investment in the economy. However, the result indicates that the management of short term capital flows could be effective, since the response function during 2004-2016q1 is statistically insignificant.

(b) Response of Industrial (manufacturing) Production

The impulse response function of (total) manufacturing to total capital inflows over the period shows relatively limited effect on production activities, though the response functions are positive (Table 6, Fig.7-1).

While the response function of the manufacturing to portfolio and other investment inflows and that of nondurable manufacturing (including oil and other energy sector) were positive during 1994-2003, the response of total manufacturing as well as nondurable manufacturing turned to insignificant during 2004-2016Q1. Also, the positive response of manufacturing to FDI inflows became insignificant, as shown in the response of BVAR. This could be explained by the fact that the real economy has not been affected by the external capital flows in recent years[14].

Thus, both VAR and BVAR based impulse response functions show that the overall effects of capital flows on manufacturing production and GDP growth have become less significant during 2004-2016(Q1), as compared with the period1994-2003.

The above results also suggest that the effect of capital inflows on the manufacturing (both total and nondurable, oil and other sectors) sector as well as GDP growth has become much smaller, as shown in the standard deviation of the impulse response function during the period 2004-2016Q1. This indicates that the real economy - domestic production and GDP growth- has become less dependent on the external capital resources recently.

The overall results of impulse response functions of GDP growth and production are in accordance with the results shown in the Granger causality tests, and it indicates that several measures on capital account and foreign exchange controls / management have certain effects on the economy to minimize the volatile effects from the capital flows since 2004 until today.

Table 6: Impulse Response to Capital Flows (1) : VAR / Bayesian VAR

VAR estimation							
1994～2003				2004～2016 (Q1)			
Total							
Total	MFG	NDMFG	GDP	Total	MFG	NDMFG	GDP
0.551970	0.588833	0.024907	0.176321	0.182851	0.393434	3.130254	0.023339
(0.15747)	(0.23883)	(0.28831)	(0.08311)	(0.14576)	(0.16300)	(4.47721)	(0.03294)
[3.50521]	[2.46554]	[0.08639]	[2.12159]	[1.25445]	[2.41372]	[0.69915]	[0.70857]
FDI							
FDI	MFG	NDMFG	GDP	FDI	MFG	NDMFG	GDP
-0.41614	2.528130	-1.41666	0.904783	0.247171	-0.49108	5.816285	-0.07061
(0.16870)	(1.20486)	(1.40159)	(0.40791)	(0.14125)	(0.47909)	(12.5389)	(0.09186)
[-2.46670]	[2.09828]	[-1.01075]	[2.21808]	[1.74992]	[-1.02503]	[0.46386]	[-0.76862]
Portfolio							
Portfolio	MFG	NDMFG	GDP	Portfolio	MFG	NDMFG	GDP
0.182633	0.927585	0.295472	0.232188	0.086849	0.151622	8.773932	0.020522
(0.17322)	(0.40262)	(0.47852)	(0.14224)	(0.14727)	(0.26933)	(6.87885)	(0.05145)
[1.05437]	[2.30388]	[0.61747]	[1.63232]	[0.58973]	[0.56296]	[1.27549]	[0.39891]
Other							
Other	MFG	NDMFG	GDP	Other	MFG	NDMFG	GDP
0.380364	1.231048	-0.04762	0.499072	0.036381	0.617389	-1.93699	0.037497
(0.20557)	(0.64575)	(0.75481)	(0.21505)	(0.15047)	(0.19579)	(5.62410)	(0.04104)
[1.85033]	[1.90639]	[-0.06309]	[2.32075]	[0.24179]	[3.15329]	[-0.34441]	[0.91362]
Baysian VAR							
Total							
Total	MFG	NDMFG	GDP	Total	MFG	NDMFG	GDP
0.153251	0.120901	0.008963	0.045980	-0.02971	0.056495	0.536351	0.082151
(0.08252)	(0.08055)	(0.07074)	(0.02148)	(0.08123)	(0.10386)	(1.23584)	(0.08958)
[1.85711]	[1.50101]	[0.12670]	[2.14090]	[-0.36578]	[0.54395]	[0.43400]	[0.91705]
FDI							
FDI	MFG	NDMFG	GDP	FDI	MFG	NDMFG	GDP
0.312330	0.292961	0.274802	0.124947	0.041073	0.024426	1.046116	0.148518
(0.07339)	(0.38051)	(0.28947)	(0.10144)	(0.08320)	(0.26696)	(3.16496)	(0.23034)
[4.25601]	[0.76992]	[0.94934]	[1.23171]	[0.49369]	[0.09150]	[0.33053]	[0.64477]
Portfolio							
Portfolio	MFG	NDMFG	GDP	Portfolio	MFG	NDMFG	GDP
0.020185	0.174888	0.122146	0.067187	0.032782	0.051089	0.997582	0.095756
(0.08392)	(0.13589)	(0.11616)	(0.03777)	(0.08294)	(0.13527)	(1.59287)	(0.11470)
[0.24053]	[1.28701]	[1.05156]	[1.77867]	[0.39526]	[0.37768]	[0.62628]	[0.83487]
Other							
Other	MFG	NDMFG	GDP	Other	MFG	NDMFG	GDP
0.118383	0.201796	-0.18179	0.053905	-0.0502	0.042392	-0.22256	-0.00871
(0.08380)	(0.18041)	(0.13080)	(0.05054)	(0.07918)	(0.12369)	(1.46641)	(0.10451)
[1.41268]	[1.11855]	[-1.38984]	[1.06662]	[-0.63400]	[0.34271]	[-0.15177]	[-0.08336]

Notes: 1. Standard errors in ( ) & t-statistics in [ ].
2. Shaded areas show that the response functions are statistically significant.
Sources: Author's calculation based on the IFS database (IMF), Bank Indonesia

Fig.7-1 Impulse Response (1) Capital Inflows; Mfg; Non-durable Mfg, GDP growth [1994-2003]

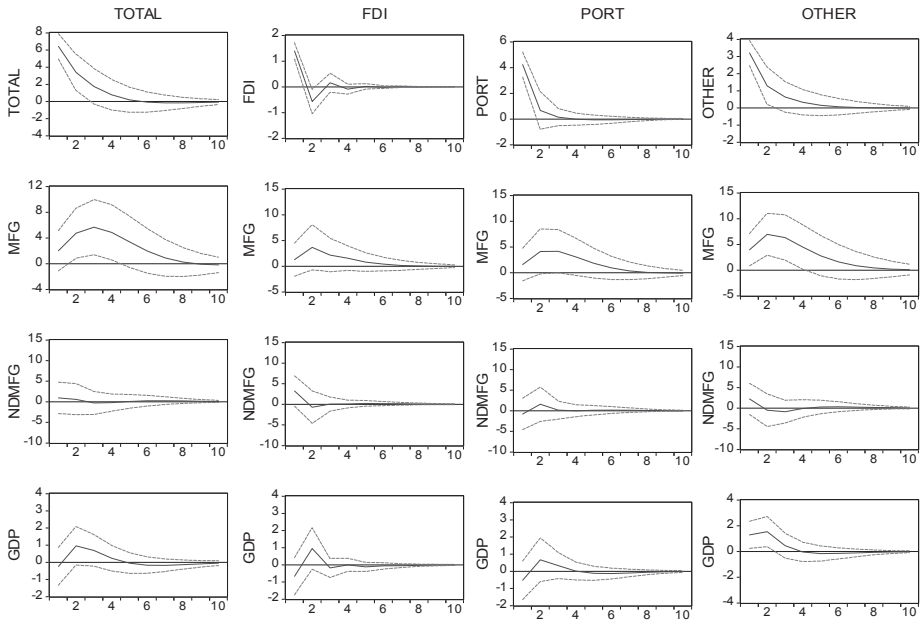


Fig.7-2 Impulse Response (1) Capital Inflows; Mfg; Non-durable Mfg, GDP growth [1994-2003] (BVAR)

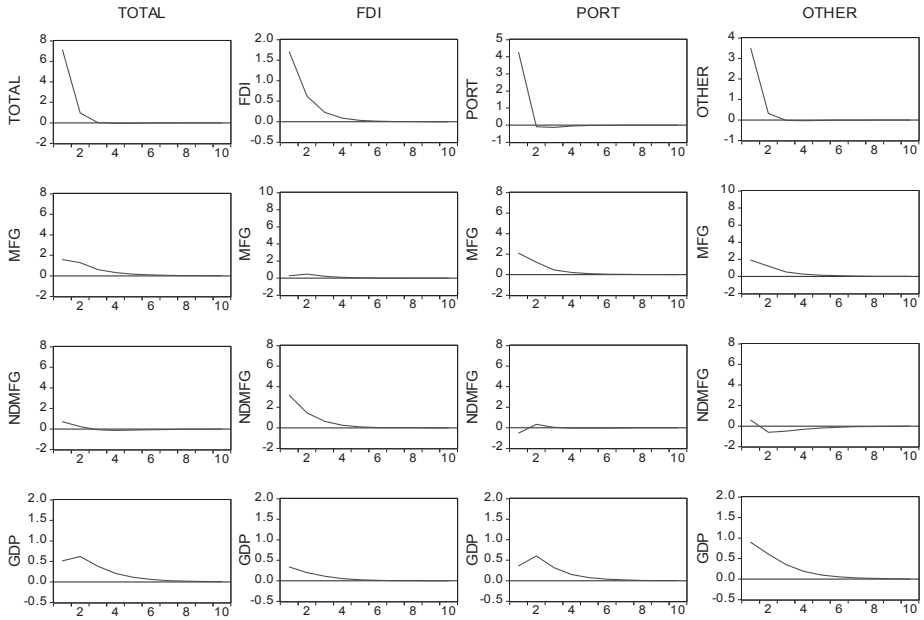


Fig.7-3 Impulse Response (1) Capital Inflows; Mfg; Non-durable Mfg, GDP growth [2004-2016Q1]

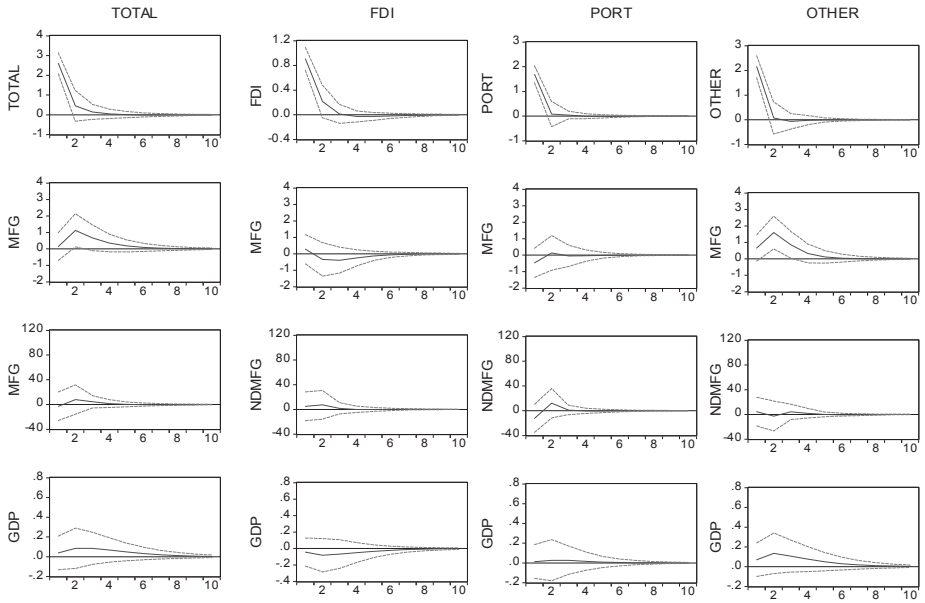
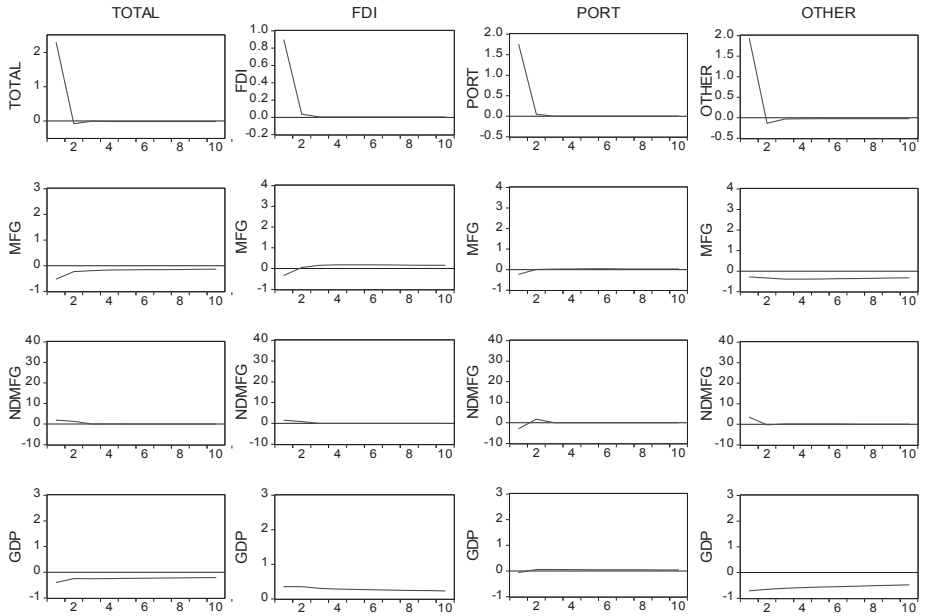


Fig.7-4 Impulse Response (1) Capital Inflows; Mfg; Non-durable Mfg, GDP growth [2004-2016Q1] (BVAR)



3.6.2 Effects on the Exchange Rate and Monetary/Financial Sectors

In this model, the variables include: capital flows (Total; FDI; Portfolio; Other investment) variables, real effective exchange rate (REER); money stocks (M2); interest rate (money market rate [Intrate]), and Share price (Share). Based on the VAR and BVAR models, analyses are made on the capital inflows on the market. To examine the effects of capital flows in different period, the periods are divided into 2 periods: (a) 1994-2003; (b) 2008Q3-2016Q1 (post-IMF program period). The summarized results of each impulse response function are shown in Table 6 (variables and Fig 8-1 ~ 8-4

(a) Real Effective Exchange Rate (REER)

The impulse response functions of real effective exchange rate (REER) to capital inflows, especially short-term capital flows (Portfolio/other investment) became much smaller and statistically insignificant in terms of standard deviation during the period 2004-2016Q1, compared with the period 1994-2003. This is common to both response functions of VAR and BVAR.

In the response functions of REER to portfolio and other capital inflows, the degree of standard deviation became insignificant and smaller during 2004-2016Q1 as compared with that during 1994-2003. This indicates that the management of exchange rate of local currency has been successful in stabilizing the real exchange rate, avoiding significant appreciation and volatility of the real effective exchange rate, even under the increased pressure of short-term capital inflows with the expansion of the global capital flows since the mid-2000s.

(b) Money Stock (M2)

The impulse response functions of M2 to capital inflows also show similar trends as the case of REER: the degree of standard deviation of during 2004-2016Q1 is much smaller, as compared with the period 1994-2003 (Fig.8-1 ~ 8-4). Particularly, the impulse response functions of M2 to portfolio investment indicate very limited effect on M2 during 2004-2016Q1, if it is compared with the degree of deviation of the response functions with the previous period 1994-2003. This could be observed in both VAR and BVAR based analyses. The smaller impact of the capital flows on the money stock (M2) during 2004-2016Q1 could be due to the central bank's operation and several measures of prudential policies and foreign exchange management/ controls introduced during the period[15].

Fig.8-1 Impulse Response (2) Capital Flows; REER; M2; Interest rate; Share [1994-2003]

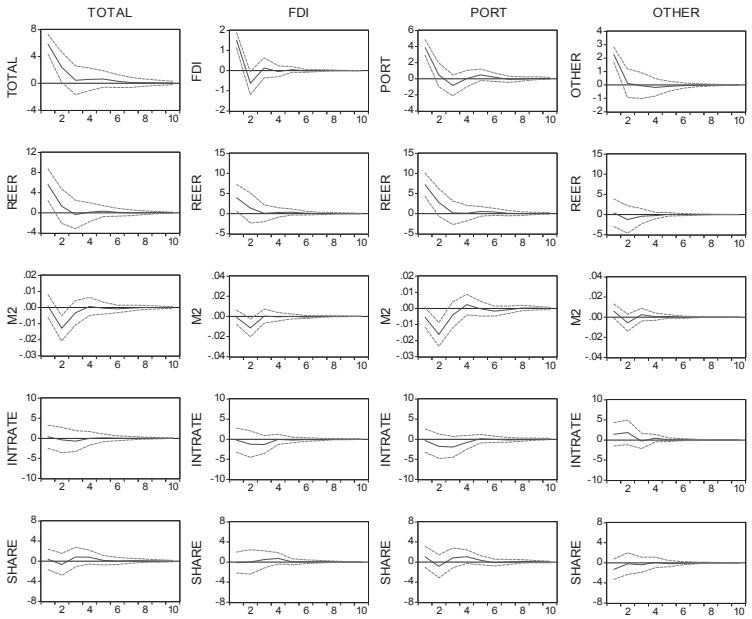


Fig.8-2 Impulse Response (2) Capital Inflows; REER; M2; Interest rate; Share [1994-2003] (BVAR)

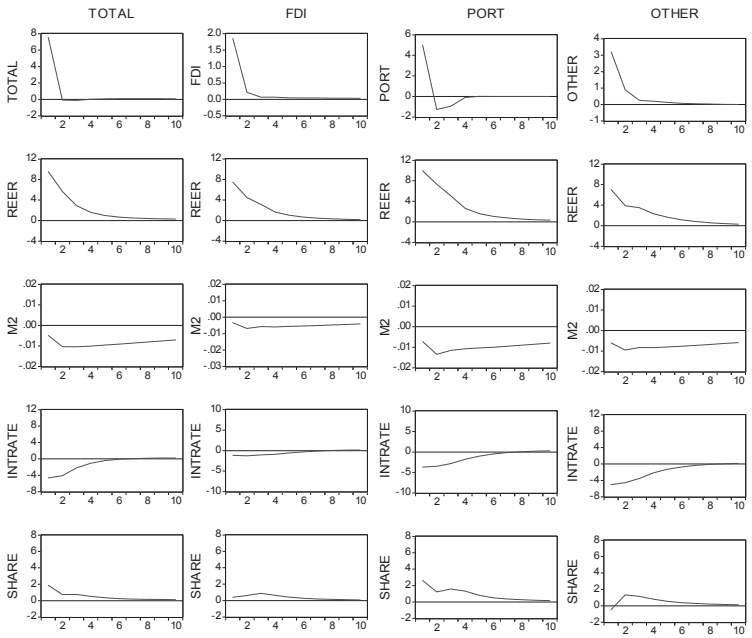


Fig.8-3: Impulse Response (2) Capital Inflows; REER; M2; Interest rate; Share [2004-2016]

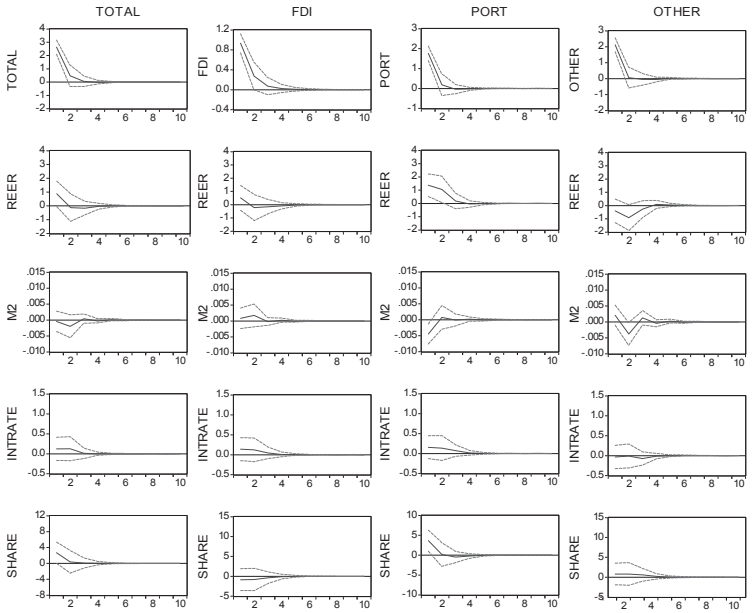
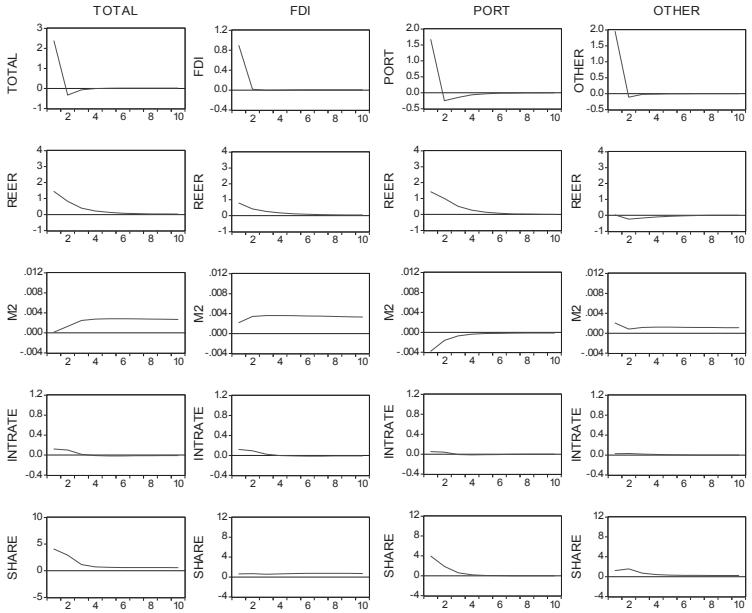


Fig.8-4: Impulse Response (2) Capital Inflows; REER; M2; Interest rate; Share [2004-2016] (BVAR)



(c) Interest rate (money market rate)

The impulse response functions of interest rate (money market rate) to all capital inflows were statistically significant during 1994-2003 (Fig.8-1 ~ 8-2). However, it became much smaller and insignificant and the magnitude of response itself was very limited in terms of standard deviation (see the scales of the axis in the figures) during 2004-2016Q1 in both VAR and BVAR. It indicates that the monetary policy was actually effective in stabilizing the money market interest rates in Indonesia even under the increase in the capital flows, including short-term capital since mid-2000s[16].

(d) Share prices (Share)

The capital inflows generally had small impact upon the share prices, as we see the impulse response functions are statistically insignificant during the whole period 2004-2016Q1. This is generally accounted for by the fact that stability of the economy and the market has been realized during the period. Thus, the capital market has become more independent as compared with the period of 1994-2003, during which significant response to portfolio investment flows is observed.

3.7 Overall evaluation

The overall results of impulse response functions of GDP growth, production, as well as foreign exchange and monetary/financial sectors are summarized as follows:

First, the impact of capital inflows upon the real sector as well as monetary and financial markets has become limited and increasingly smaller since 2004. This is shown by the standard deviation of the impulse response functions based on VAR/BVAR models, and the results became insignificant over the period 2004-2016Q1. This result is also in line with the results of Granger causality tests in the former section. It could be due to the fact that capital management and prudential controls in Indonesia have been strengthened since 2004 after the termination of the IMF program.

Second, FDI inflows have put smaller impact upon the real sector, as well as the monetary and financial sector during 2004-2016Q1 as compared with that of 1994-2003. This shows that FDI inflows are not always invested in productive sectors and the GDP growth and productive activities are not dependent on the external capital resources.

Third, portfolio investment has significantly changed and put very limited

effect on the real economy and the capital market in recent years, as compared with the period of 1994-2003, when significantly negative effect on the GDP growth and manufacturing sectors observed. This implies that the domestic economy and the market have become independent and less affected by the capital flows since 2004.

Fourth, other investment inflows (mainly external borrowings) were the major source for investment and production in the manufacturing sectors during the whole period, but the impact of other (short-term) investment on GDP growth and production has become limited in Indonesia recently.

The above results suggest that the capital management / controls of short term capital flows could be effective, since the response function indicates significantly positive effects on the GDP growth and manufacturing industry during 2004-2016Q1. On the other hand, there is no negative effects on the exchange and financial markets during the same period.

Therefore, the results based on the VAR / BVAR models indicate that the overall effects of capital inflows on the real economy and the domestic market have significantly decreased recently. This means that pro-cyclicality of capital flows has been mitigated by several capital management/controls since 2004. It could be concluded that economic and monetary policy have become more independent in Indonesia after the termination of the IMF program, which made the country to adopt foreign exchange and capital control measures.

4. Concluding Remarks

This paper evaluates the overall effects of capital inflows (FDI, portfolio, other investment) on the real economy (GDP growth, production), as well as foreign exchange and monetary/ financial sectors in Indonesia during 1994-2016Q1, which covers the period of Asian crisis (1997/8) and the IMF program (1994-2003) regime, as well as the post-IMF program period since 2004. The study also examined the overall effects of capital management and controls introduced after the IMF program period since 2004.

The analysis is based on the VAR (Vector autoregressive) and Bayesian VAR (BVAR) models to examine the impact of capital inflows (net) on the GDP growth, manufacturing production (whole sector), nondurable manufacturing (incl. oil, coal and petroleum sector), real effective exchange rate (REER), money stocks (M2), interest rate (money market rate), and share prices. Analyses including Granger causality test and impulse response function, are undertaken to identify the effects of the changes in the capital inflows between the former (1997-2003) and later pe-

riod (2004-2016Q1).

The outcome of Granger causality test and impulse response functions of each capital inflow variable shows that the overall impact of capital inflows, especially short-term capital, on the real sector of the economy (GDP growth, manufacturing) as well as monetary and financial sectors have become smaller and insignificant since the termination of the IMF program in 2004.

The results of impulse response functions clearly show that standard deviation of response functions of each variable (GDP growth, manufacturing production, REER, M2, Interest rate, share prices) became significantly smaller and insignificant during the period of 'post-IMF' program, as compared with that of 1994-2003, especially during the period of post-Lehman shock (2008Q3-2016Q1), during which the effects of capital flows on the economy and market in Indonesia have become significantly smaller and minimized in the 'post-IMF' regime since 2004.

The above results indicate that the Indonesian economy is now less dependent on capital flows in the real economy as well as the monetary/ financial sector, which would reduce the risk of speculative short capital flows through mitigating pro-cyclical nature of capital flows. This outcome could be caused by independent economic/ monetary policy including several measures of capital account and foreign exchange management and controls by the Indonesian authority (Bank Indonesia), that have been undertaken with the termination of IMF program in 2003. The policy changes put positive effects on the real economy with less pro-cyclicality and volatility of the foreign exchange, monetary/ financial sectors, and contribute to stabilization of the real economy in Indonesia in the 2000s. As a result, the Indonesian economy has become more resilient to the significant changes in capital flows before and after the global financial crisis (2008).

It could be concluded that the experience of Indonesia gives us an important lesson of capital account management and controls, which enable developing and emerging countries to conduct independent monetary and foreign exchange policies.

Notes:

1. Several scholars, including Krugman and Subramanian, consider that capital account liberalization policies are to be introduced from the viewpoint of stability of the capital and financial markets. See Subramanian (2009), Krugman (2009). The IMF finally admitted that capital control measures in capital inflows could be effective in case of emergency (Ostry et al. 2010, 2011). This was officially claimed by the statement by the IMF staff, "IMF was looking at range of measures to gauge what would be the appropriate response for countries, including capital controls,

currency appreciation, reserves accumulation and fiscal contraction." in January 2011(IMF 2011). Although the IMF has made statement on the effectiveness of controls on capital inflows as short-term capital management, it has not admitted that capital account controls and management should be introduced medium to long-term term for developing countries.

2. In this regard, Stiglitz (2011) also claims the effectiveness of capital controls and regulations to ensure financial stability, not as temporary measures.

3. Yoshitomi (2003) introduced the background of external borrowing without hedging exchange rate among the Indonesian entities before the Asian Crisis

4. Stand-By arrangement (SBA) program of IMF was introduced in November 1997, which was extended to the Extended Facility until 2003. Foreign exchange controls were introduced in Indonesia in 2001.

5. The KAOPEN index may not reflect several changes in capital and foreign exchange controls introduced in the 2000s.

6. The IMF's stance towards capital account controls changed after the resignation of Stanley Fischer (the former First Deputy Managing Director) in the midst of the Argentine Crisis in 2001. Fischer was the key person of the IMF who promoted capital account liberalization and fixed foreign exchange regime during his period (1994-2001).

7. IBRAs' objectives were to administer the government's blanket guarantee program, and to supervise, manage and restructure distress banks in line with the IMF program. The bad debt was separated from the major body of banks which need capital injection, but the debt has not decreased in the past years, so that the essentially restructuring the banking sector was the major role for IBRA. It dissolved in April 2004, after the termination of the IMF program. The activity of IBRA was not substantially effective until 2001, and the major role was to injection of the capital for the restructuring major banks (Takayasu, 2005 Ch.4). There is some question whether the IBRA was really effective in the reforming the whole banking sector. See Komatsu (2008).

8. Azis (2001) suggests that debt resolution and keeping the interest rate from surging continually in the case of capital account crises.

9. Aramaki (2008) indicates the segregated account of local currency with dollars and other convertible currencies,) in comparison with Korea and Thailand.

10 .The amount of current account is based on the goods and services. The IFS database provides a separate dataset, which indicates current account (net) 'Excludes Exceptional Financing'. The current account deficit based on the latter indicates 4.7% of GDP in the 2nd quarter of 1996.

11. It is important to examine the effect of capital inflows on the real sector, so that the VAR models of (1) and (2) include two variables, GDP growth and industrial production (manufacturing), respectively.

12 .The logarithm of real effective exchange rate (REER) also could be rejected on the unit root test, without first lag. Armad & Masood (2009) suggested that the effects of capital inflows on long-term relations of real effective exchange rates (REER) based both on the export and trade based prices. They indicated that the REER has bi-directional causality and cointegration relationship between total capital inflows, as well as the total foreign reserves, using unit root tests (ADF and Schmidt & Phillips) and cointegration test.

13. The Granger Causality test usually involved p-value of each variable, together with F-test based value. However, the analysis in this paper only shows the results of F-test.

14. This could be partly due to the fact that FDI inflows facilitate imports of capital goods and other materials, which result in deterioration of the current account. Supporting industries in Indonesia are still small in several manufacturing sectors, so that increase in imports would

deteriorate the trade and current account balance with the surge of FDI recently. In this respect, there is some possibility that increasing imported intermediate inputs would hinder the development of backward linkages, which could be one of the major forces for manufacturing and economic growth. Alfaro et al. (2010) suggests such a lack of backward linkages may hinder the growth.

15. The costs of 'sterilization' borne by the central bank went up for the issuance of SBI in Indonesia in 2010. The costs of 'sterilization' in Indonesia is relatively high, due to the interest payment and other cost of issuance of SBI (see US City Investment Research).

16. The interbank money market rates are influenced by the changes in minimum requirement of the reserves at the Central Bank, which are used to control the market rates.

[References]

Aizenman, Jushua, 2013, Why Do Emerging Market Liberalize Capital Outflow Control?, *NBER Working Paper* 18879, National Bureau of Economic Research.

Alfaro, L., A. Chandra, S. Kalemi-Ozcan, *a*nd S. Sayek, 2010, Does Foreign Direct Investment Promote Growth? Exploring the Role of Financial Markets on linkages, *Journal of Development Economics*, 91, pp.242-256.

Alfaro, L., A. Chandra, S. Kalemi-Ozcan, and S. Sayek, 2009, FDI, productivity and Financial Development, *The World Economy* 32, pp. 111-135.

Aramaki, Kenji, 2009, Capital Account Liberalization and International Capital Flows: Cases of Korea, Thailand and Indonesia, * *Financial Review*, No.93, pp.113-175, Policy Research Institute, Ministry of Finance, Japan.

Azis, Iwan J., 2001, Modeling Crisis Evolution and Counterfactual Policy Simulations: A Country Case Study, *ADB Institute Working Paper* 23, ADB Institute, Tokyo.

BIS. Statistics 'Real Effective Rate' Available from URL: http://www.bis.org/statistics/eer/index.htm

Blundell-Wignall, Adrian and Caroline Roulet, 2014, Capital controls on inflows, the global financial crisis and economic growth: Evidence for emerging economies, *OECD Journal: Financial Market Trend*s, Volume 2013/2

Carkovic, M. and Levine, R., 2002, Does Foreign Direct Investment Accelerate Economic Growth?, *Department of Finance Working Paper*, University of Minnesota.

Chinn, Menzie and Hiro Ito, 2012, The Chinn-Ito Index: – A de jure measure of financial Openness – http://web.pdx.edu/~ito/Chinn-Ito_website.htm

Cipolllina, Maria, G.Giovanetti, F. Pietrovito, A.F.Pozzolo, 2011, FDI and Growth: What Cross-Country Industry Data Say, Government of the Italian Republic (Italy), Ministry of Economy and Finance, Department of the Treasury Working Paper No. 10

Cordero, Jose Antonio and J.A.Montecino, 2010, Capital Controls and Monetary Policy in Developing Countries. *Center for Economic and Policy Research*, April 2010

Dhanani, Shafiq and Syed Asif Hasnain, 2002, The Impact of Foreign Direct Investment on Indonesia's manufacturing Sector, *Journal of the Asia Pacific Economy*, Volume 7, Number 1, pp. 61-94 (34), 1 February 2002.

Effendi, Nury and Femmy M. Soemantri, 2003, Foreign Direct Investment and Regional Economic Growth in Indonesia: A Panel Data Study, *Working Paper in Economics and Development Studies* No.200305, Department of Economics, Padjadjaran University.

Gallagher, Kevin P., 2011. Regaining Control? Capital Controls and the Global Financial Crisis. *PERI Working Paper* No. 250, February 2011

Ghosh, Atish R, J.D. Ostry, and M.S. Qureshi. 2015, Exchange Rate Management and Crisis Susceptibility: A Reassessment, *IMF Economic Review*, Volume 63, Issue 1, pp. 238–276

Ghosh, Atish R. and Qureshi, Mahvash S., 2016, Capital Inflow Surges and Consequences, *ADBI Working Paper* No.585, July 2016

Habelmeier, Karl, A. Kokenyne, C.Baba, 2011, The Effectiveness of Capital Controls and Prudential Policies in Managing Large Inflows. *IMF Staff Discussion Note* (SDN)/11/14, August 2011

Hendarsah, Nanang, 2010, Challenges and Policy Options in Portfolio Investment Flows: Bank Indonesia's Recent Experiences, *Directorate of Economic Research and Monetary Policy*, Bank Indonesia, November 2010.

IMF, 2003, The IMF and Recent Capital Account Crises – Indonesia, Korea and Brazil. *Independent Evaluation Office (IEO)*, September 2003

IMF, 2011a, IMF High–Level Roundtable: Financial Crisis and Sovereign Risk—Implications for Financial Stability. March 18, Washington, D.C.

IMF, 2011b, *World Economic Outlook* Ch.4 Washington, D.C. April 2011

IMF. International Financial Statistics (IFS): database Available from URL: http://elibrary-data.imf.org/

IMF. *World Economic Outlook (WEO)* database, Available from URL: http://www.imf.org/external/pubs/ft/weo/2016/02/weodata/index.aspx

Ito, Hiro and Masahiro Kawai, 2012, New Measures of the Trilemma Hypothesis: Implications for Asia, *ADBI Working Paper* No.381, September 2012.

Joshi, Vijay, 2003, Financial Globalization, Exchange Rates, and Capital Controls in Developing Countries. *Paper for Conference organized by the Re-inventing Bretton Woods Committee*, Madrid, 13-14 May,

Kawai, Masahiro and Lamberte, M.B., 2010, Eds. *Managing Capital Flows: The Research for a Framework.* Asian Development Bank Institute, Edward Elgar Publishing Inc. MA, 2010

Komatsu, Masaaki, 2008, Development of Financial Sector and Monetary Policy in Indonesia.* In *Economic Development and Financial System in Asia: South East Asia* (eds by Teranishi and Fukuda), Toyo Keizai Shinposha, April 2008.

Kose, M. Ayhan, Eswar Prasad, Kenneth Rogoff, and Shang-Jin Wei, 2008, Financial Globalization and Economic Policies. *Handbook of Development Economics*, eds. Dani Rodrik and Mark Rosenzweig

Mohan, Rakesh and Kapur, Muneesh, 2010, Liberalization and Regulation of Capital Flows: Lessons for Emerging Market Economies. *ADBI Working Paper* No.186, January 2010 No.18, 103-118 Ohta, Hideaki, 1999, Currency Crises and International Financial System.* *International Finance,* No.1031, September 1999.

Ohta, Hideaki, 2009, The Effects of Capital Inflows on Economic Growth, Domestic Savings and Investment in the Emerging Economies.* *Quarterly Journal of Policy Analysis*, Vol.4 No.1&2, March 2009.

Ohta, Hideaki, 2012, *Economics of Capital Management and Controls. (Ch.3)** Nippon Hyoronsha,

Ohta, Hideaki, 2012, Capital Account Liberalization and Capital Controls in Indonesia: Effectiveness of Controls in the Real Economy and Monetary / Financial Sector* *Ehime Economic Journal* Vol.32 (1).

Ostry, J.D, A.R.Ghosh, K.Habermeier, L.Laeven, M.Chamon, M.S.Qureshi, and D.B.S.Reinhardt, 2010, Capital Inflows: The Roles of Controls, *IMF Staff Position Note* 10/04, IMF, February,

Ostry, J.D, A.R.Ghosh, K.Habermeier, L.Laeven, M.Chamon, M.S.Qureshi, A.Kokenyne, 2011, Managing Capital Inflows: What Tools to Use?. *IMF Staff Discussion Note*, April 5, 2011.

Prasad, Eswar S., Raghuram Rajan, Arvind Subramanian, 2007, Foreign Capital and Economic Growth. *Brookings Paper on Economic Activity*, 1:2007

Rahmaddi, Rudy and Masaru Ichihashi, 2012a, The Impact of Foreign Direct Investment on Host Country's Exports: Sector-Based Evidence from Indonesian Manufacturing. *IDEC (Graduate School for International Development and Cooperation) Development Policy Series* Vol.2

No.10. May 2012.
Rahmaddi, Rudy and Masaru Ichihashi, 2012b, The Changing Pattern of Export Structure and Competitiveness in Indonesia's Manufacturing Sectors: an Overview and Assessment. 2012 2nd International Conference on Economics, Trade and Development, *IPEDR* Vol. 36, IACSIT Press, Singapore
Stiglitz, Joseph E., 2008, Capital Market Liberalization, Globalization, and the IMF. In *Capital Market Liberalization and Development* (eds J.A.Ocampo and J.E.Stiglitz), pp.76-100, Oxford University Press.
Takayasu, Kennchi, 2005, *Restructuring Financial Sector: Strategies and Policy for solving Crises.* * Keisoshobo, Tokyo.
Titiheruw, I.S and Atje, R., 2008, Managing Capital Flows: The Case of Indonesia. *ADB Institute Discussion Paper* No.94, March 2008, ADB Institute, Tokyo.
Watanabe, Kenichiro, H.Akama, J.Mifune, 2002, The Effectiveness of Capital Controls and Monitoring: The Case of Non-internationalization of Emerging Market Currencies. *EMEAP Discussion Paper*, January 2002, International Department, Bank of Japan.
Walsh, J.P. and Jiangyan Yu, 2010, Determinants of Foreign Direct Investment: A Sectoral and Institutional Approach. *IMF Working Paper* WP/-10/187, July 2010.
Yeyati, Eduardo Levy, S.L.Schmukler, and N. Horen, 2008, Crises, Capital Controls, and Financial Integration. *Policy Research Working Paper* 4770, the World Bank, November
Yoshitomi, Masaru, 2003, *Truth of the Asian Economy: Miracle, Crises, and Development of Institution**.Toyo Keizai Shinposha, Tokyo.

*denotes written in Japanese.