THE RELATIONSHIP BETWEEN GLOBAL LIQUIDITY AND CAPITAL FLOWS IN EMERGING COUNTRIES
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Recently, global liquidity has received widespread attention for its impact on capital inflows to emerging countries after the global financial crisis. Accordingly, this paper defines the global liquidity as the "G3 (US, Euro Area, Japan) currency denominated cross-border credit aggregates", and examines the relationship between global liquidity and capital inflows to emerging countries. Panel data of 24 countries from 2000Q1 to 2015Q4 is utilized for empirical analysis. The regression results show that global liquidity excess increases capital inflows to emerging countries. Also, bank borrowing is found to be the most vulnerable capital flow, especially before the global financial crisis. Based on the sub-period analysis, the results suggest that the relationship between global liquidity and capital flows is different in pre- and post-financial crisis periods. In the post-crisis period, most emerging regions show less vulnerability as capital moves back to G3 countries during their economic recovery. Regional features are also an important finding of this article, as three regions – Asia, Latin America and Eastern Europe – show different patterns of vulnerability and pro-cyclicality regarding global liquidity. Asia is found to be the least vulnerable region in terms of capital flow after global financial crisis but with chronic vulnerability of bank borrowing and potential pro-cyclical risk in bond. Latin showed the most vulnerability and pro-cyclicality because the region has relied on the foreign borrowing to offset its current account deficit and adjust its exchange rate. East Europe was presented to be the least vulnerable because most of them are already EU members which means that their economies are a lot integrated with the Euro market. However, east Europe has potential pro-cyclical risk that is implicit in equity because the region has implemented the pro-cyclical policies to boost the economies and to meet the EU or Eurozone criteria.

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"Global liquidity has been expanding since the early 2000s, and the strong post-crisis monetary policy easing by major central banks spurred a further surge… This expansion and transmission of the global liquidity has dramatically changed the global financial landscape…Empirical evidence suggests that systemic risk can arise from various sources, including cross-border financial flows… Therefore, the liquidity transmission and its financial stability implications for emerging economies attract much attention." (IMF 2015, 5)

Global liquidity has been blamed for spreading the global shock from US to the world. The global shock directly affects the capital flow toward emerging countries, which are often touted as the starting point of the global financial crisis. The emerging countries are especially vulnerable to the external shock because they are highly dependent on the international trade and foreign investment for their source of growth. Therefore, the relation between the global liquidity and capital flows into the emerging economies has to be concerned in order to prevent or predict potential financial crisis which can be influential as much as or more than the global financial crisis in 2008.

According to the literature review, global push factor is more significant than domestic pull factor when explaining capital flows regarding the financial crisis and global liquidity is particularly important among push factors.

There have been several literatures that measured the global liquidity in diverse methods, but each method has its own limitation to capture global liquidity properly.

This research utilized the definition of global liquidity as "G3 (US, Euro Area and Japan) currency denominated credit aggregates" from BIS global liquidity indicator, which is the quantitative index but not usually used in the previous literatures. 24 countries are selected as the research target because those are classified as emerging economies either by IMF or World Bank.

The estimation model in this research benchmarked the models of IMF (2010) and Yoon and Kim (2012). Four global liquidity variables are the main independent variables, which include global liquidity growth, cyclical components of global/public liquidity and credit multiplier. Capital flows toward the emerging countries are the dependent variables and they also classified into 4 types – total flow, equity flow, bond flow and bank borrowing flow. Diverse global push factors and domestic pull factors are included in the model. The difference in real GDP growth and policy rate are the combined variable of push and pull factors while capital market openness, expected exchange rate appreciation, exchange rate volatility are standing for the pure domestic pull factors. In this estimation model, three variables – stock price index, GDP deflator as price index and current account balance are newly included and these variables were not considered in IMF (2010) and Yoon and Kim (2012).

Based on the estimation model developed, this research confirmed that the global liquidity positively affects the capital inflows of emerging countries, and bank borrowing is the main cause of the vulnerability before the global financial crisis. However, the most vulnerable or the most pro-cyclical capital are different from the regions after the global financial crisis.

Literature Review

Financial crisis is a critical event in the capitalistic market system and it is manifest that capital flow is the critical element regarding financial crisis, as sudden stops or reversal of capital inflow cause the financial crisis. (Claessens and Kose 2013)

Accordingly, numerous literatures have studied which factors determine the capital flow. Regarding the international capital flow, there are the mechanism analyzing the capital flow – the pull factor and the push factor. Traditionally push-and-pull mechanism refers to global "push" and domestic "pull" factors while Kim et al. (2012) identified "supply push" and "demand pull" factors to emphasize supply-and-demand aspect of international capital flow. Between these two factors, many literatures figured out that push factors which is the global and supply factors is more important in terms of financial crises (see Fratzscher, 2012; Forbes and Warnock, 2012). Ghosh et al (2012) admitted that capital flows are affected by both push and pull factors still, it emphasized the importance of the push factor because international investors tend to be more sensitive to global conditions rather than domestic situations. In addition, Ghosh et al (2012) explained that global push factors are the main key to determine whether capital surge will happen while domestic pull factors such as economic performance, the need of external financing, capital account openness, and institutional quality decide the magnitude of the surge. Although previous literatures mostly agreed that global push factor is critical factor explaining financial crises, there has been no agreement which push factor is the most significant.

Among push factors, the concept of "global liquidity" has become important since the global financial crisis as it was blamed for the fast diffusion of the shock from US to emerging and developing countries. The relation between global liquidity and the capital flows of emerging countries became another important issues.

According to Yoon and Kim (2012), global liquidity affect capital inflow toward emerging countries by two stages – firstly, the advanced countries including US implemented quantitative easing policy to overcome recession

and financial crisis as IMF (2011c) pointed. Then according to Bruno and Shin (2014)'s finding, large international banks' cross-border investment has acted as the spreading channel of external shock, which stimulate the global liquidity to surge and encourage capital to flow into emerging markets. Therefore, emerging economies are especially vulnerable to the economic shock from the international capital flow during the financial crisis. Drastic fluctuation in international capital flow can causes dramatic depreciation of nominal and real exchange rate and this can bring up serious economic recession and currency or sudden stops crisis.

There have been literatures studied the global push factor which can measure or represent global liquidity affecting capital flows in emerging countries. [Table 1] explains each measurement of previous research and the limitations.

investment is negatively affected by it. M2 of those advanced countries is also reasonable measurement as it can reflect the domestic liquidity of those three countries and as IMF (2010) found, it can show the equity flow properly. However it cannot explain drastic surge of bond flow and bank borrowing flow just before the global financial crisis and sudden stops of them right after the crisis, which is highly related to the cause of the financial crisis. All these previous measurement regarded diverse global factors as the status of the global liquidity rather than measured the global liquidity itself quantitatively. Yoon and Kim (2012) utilized comparatively recent index which was established by BIS (Bank of International Settlement). BIS defined the global liquidity as the "G3 (US, Euro Area and Japan) currency denominated credit aggregates". Yoon and Kim (2012) utilized this concept and constructed the combined model of global

[Table 1: Global liquidity measurements and limitations]

Proxy	Literatures	Limitation
US interest rate	IMF 2011b; Ghosh et al. 2012; Moore et al. 2013.	1. The policy rate of US already hit the bottom. 2. Cannot reflect EU or Japan's policies.
Exchange rate	Choi 2014	1. Hard to apply to multiple countries. 2. Not helpful for preventing global shock.(Passari and Rey 2014)
VIX	Passari and Rey 2014; Bruno and Shin 2014	Cannot show information about risk from the other currencies.
TED spread	Fratzscher 2012	Cannot measure the cross-border credit growth directly.

Relatively recognized proxy for the global liquidity is M2 (money supply) of the major economies. IMF (2010) defined the global liquidity as M2 (money supply) of G4 (US, Euro area, Japan and United Kingdom) and tried to explained the capital flows. It researched 34 countries panel data from January, 2003 to December, 2009 and it found that M2 significantly and positively affect equity inflows only while there is no significance in bond flow and bank's borrowing flow and direct

liquidity with exchange rate, VIX, policy rate and real GDP growth rate. It found that surplus in global liquidity increased the capital inflow to emerging economies before the financial crisis. Moreover, Yoon and Kim (2012) divided global liquidity into four variables – global liquidity growth which was provided by BIS, global liquidity cyclical variation, credit multiplier whose value is the global liquidity divided by public liquidity[1] and public liquidity cyclical variation. The research has found that the global

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[1] M2 of G3 (by Yoon and Kim, 2012)

liquidity growth positively affect all kinds of capital inflow to emerging countries but if the global liquidity is higher than the long-term trend only bank borrowing is positively affected. According to the empirical research, Yoon and Kim (2012) interpreted that bank borrowing is the most vulnerable to the global liquidity and the equity flow is the least.

Yoon and Kim (2012)'s model considered not only global push factors but also the domestic pull factors through its combined model including price index and quantitative indexes. However, the research also has some limitations. It selected 25 emerging countries without

find out regional features and other variables that previous literatures have overlooked.

Research Design

Global liquidity
As [Figure 1] shows, global liquidity is the main cause of surge and sudden stops or/and reversal of capital inflows, which directly encouraged the global financial crisis to happen. In this research, major independent variable is the global liquidity and the dependent variable is the capital flows, and this research is trying to find out the relation between those major variables.

[Figure 1: The relationship between major variables]
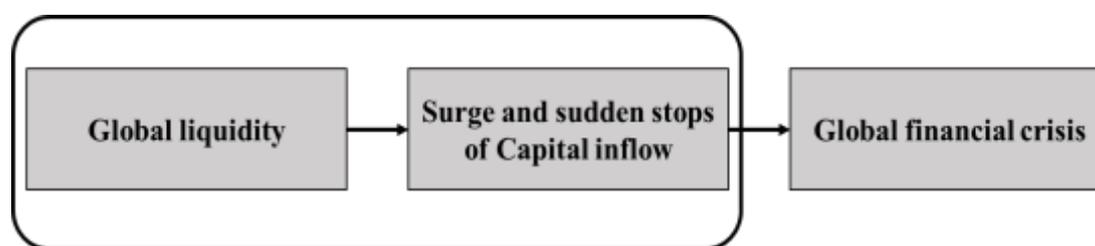
explicit criteria and their regional contexts were ignored in Yoon and Kim (2012)'s research. Reminding that Asian financial crisis was spread to other Asian countries from Thailand even though their macroeconomic fundamentals were showing sound performance, international investors withdrew their capital from all Asian regions. Likewise, international investors tend to make their portfolio based on the region rather than each country. Thus regarding capital flow, regional features also need to be considered. All previous literatures focused on the global liquidity's impact to all selected emerging countries or just one single country, which means that regional context was not included in the researches.

Therefore this research benchmarked and complemented IMF (2010) and Yoon and Kim (2012) empirical models to figure out the relation between the global liquidity and capital inflows to emerging countries. The selected countries will be different from those two literatures and the research period will be extended. In addition, the research will try to

Previous literatures have considered price index only when measuring the global liquidity like IMF (2010) did. However, CGFS (2011) and BIS (2013) insisted that quantitative index also needs to be considered together with the price index to comprehend the international liquidity situations because those two indexes can provide similar and different information time to time. Therefore, this research will utilize the definition of global liquidity that three literatures (CGFS 2011; Yoon and Kim 2012; BIS 2013) has defined which is the "G3 (US, Euro Area, Japan) denominated cross-border credit aggregates", the quantitative index.

In the global liquidity definition above, United Kingdom is excluded in these three literatures because the money supply portion of the Pound Sterling in international market has declined and its influence moved to Euro after the Euro invented.

Although Yoon and Kim (2012) combined G3's the total liabilities of non-financial sectors (households, companies and government) in the Flow of Funds account and cross-border

financial claims and utilized the value as the global liquidity indicator, this research will stick to the CGFS (2011) and BIS (2013)'s indicator to avoid misleading. The global liquidity indicator is being reported quarterly by BIS since 2000. Yoon and Kim (2012) defined the public liquidity as the M2 of G3 to recognize the diverse effect of the international liquidity situation and this research will also utilize the definition also.

The trend of the global liquidity and the public liquidity that will be utilized in this research is presented in [Figure 2] and [Figure 3] below.

For the data analysis, raw data of global liquidity is not useful because it will be likely to increase constantly as already created liquidity hardly disappear. Accordingly, the growth rate of the global liquidity compared to the same quarter in previous year is needed as it can remove the impact of the economic cyclical fluctuation.

The growth rate of the public liquidity seems to be more volatile than that of the global liquidity, but the average growth rate of the public liquidity is 0.05% while that of the global liquidity is 4.85%. Both growth rates are

[Figure 2: Global liquidity 2000 - 2015]
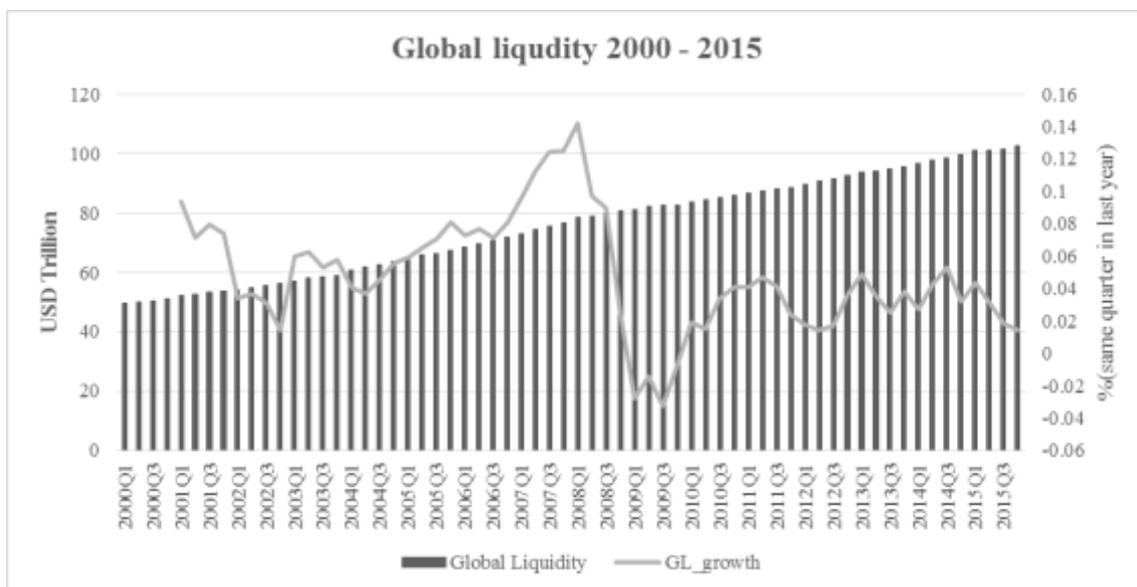
[Figure 3: Public liquidity 2000 - 2015]
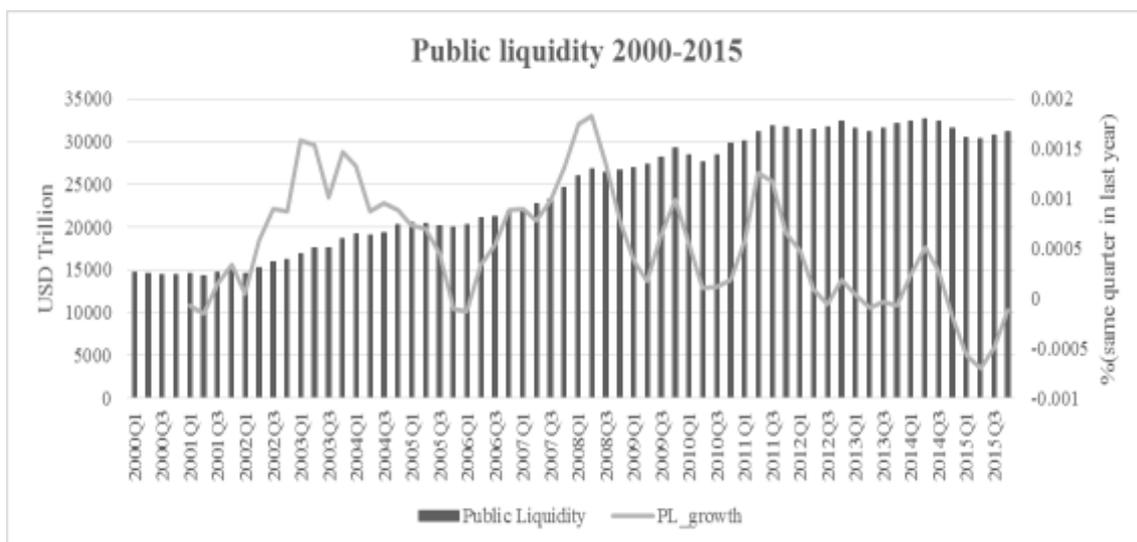
showing drastic surge right before the global financial crisis, but only the growth rate of the global liquidity showed the plunge until below 0 level which can be the main cause of the global financial crisis

The global liquidity growth pattern seems to be highly related to the macro-economic situations in advanced economies while the public liquidity growth pattern is related to the cyclical components. The global liquidity was expanded from 2002 when dotcom bubble burst, and it reached the peak in the first quarter of 2008 which was the right before global financial crisis spread to the world. Then it shrank in the global financial crisis period, and it gradually re-increased until the second quarter of 2011 and its increasing velocity got slowing down because of the Eurozone crisis. On the other hand, the public liquidity growth also increased to manage after the dotcom bubble crisis and it shrank in 2005 - 2006 when the advanced economies were recovered. Then it skyrocketed right before the global financial crisis and it occasionally surged after the crisis.

The Figure is presenting that the portion of US dollar has been increasing while Japanese Yen has been decreasing. In the first quarter of 2000, US dollar occupied 41.65% of this credit aggregates and Japanese Yen was 28.16% but in the fourth quarter of 2015, US dollar formed 53.06% which is over the half while Japanese Yen comprised 16.20%. Euro has shown continuously stable share.

Emerging countries' capital flows
As there has been no unified definition of "emerging countries" or "emerging economies", the research targets of previous literatures were all different. This research followed the classification of IMF's Economic outlook and World Bank's EMBI (Emerging Market Bond Index), so following 24 countries are defined as emerging countries either by IMF or World Bank except the Republic of Korea. Although both institutions did not defined the Republic of Korea as an emerging country, Yoon and Kim (2012) found that the country has been showing similar capital flows pattern with other emerging

[Figure 4: Global liquidity composition 2000 - 2015]

Source: BIS Global liquidity indicator and calculated by the author

[Figure 4] above is showing the portion of US dollar, Euro and Japanese Yen within the global liquidity indicators. The average component ratio of the global liquidity from 2000 to 2015 is 47.93% for US dollar, 31.45% for Euro and 20.61% for Japanese Yen.

countries, therefore it is included in this research. In addition, Ree et al. (2012) pointed that the Republic of Korea has shown 4 times larger capital outflow right before the global financial crisis because the country is highly dependent on the international trade and has

severe maturity mismatch of banks. Therefore, the Republic of Korea has to be regarded as one of the emerging countries in terms of capital flows. [Table 2] is showing 24 emerging countries that are selected in this research.

[Table 2: 24 Emerging Countries]

Asia	Latin America	Eastern Europe
China India Indonesia Republic of Korea Malaysia Philippines Thailand Vietnam	Argentina Brazil Chile Colombia Ecuador Mexico Peru Venezuela	Bulgaria Hungary Poland Romania Russia Federation Slovenia Turkey Ukraine

Capital flow implies the financial transactions between countries and it is recorded in the financial accounts of each country. Therefore, capital inflows of these countries correspond to the liabilities of their financial accounts. This research focuses on the capital inflow rather than the net capital inflow which is the extract value of capital outflow from capital inflow because capital inflows in emerging countries are large enough to be studied itself and it has been the factor that causes external shock.

[Figure 5] is presenting the types of capital inflows for the empirical research.
In this paper, four types of capital inflows are studied – total flow, equity flow, bond flow and bank's borrowing flow. Each flow is pertinent to the explanation of [Figure 5] and [Table 3].

[Table 3: Explanation of those capital inflows]

Name	Explanation
Capital Inflow	Total flow
Equity Securities	Equity Flow
Debt Securities	Bond Flow
Other Investment	Bank Borrowing Flow

As shown in the figure, there are diverse channel of capital inflow – direct investment (FDI), portfolio investment, financial derivatives and other investment. This paper set capital inflows similar with those of Yoon and Kim (2012), excluding direct investment and financial derivatives from the analysis target because of the following reasons. The direct investment which is usually called FDI (Foreign Direct Investment) is relatively stable, not easily affected by external factor and it is not directly associated with financial crises, and financial

[Figure 5: Global liquidity composition 2000 - 2015]
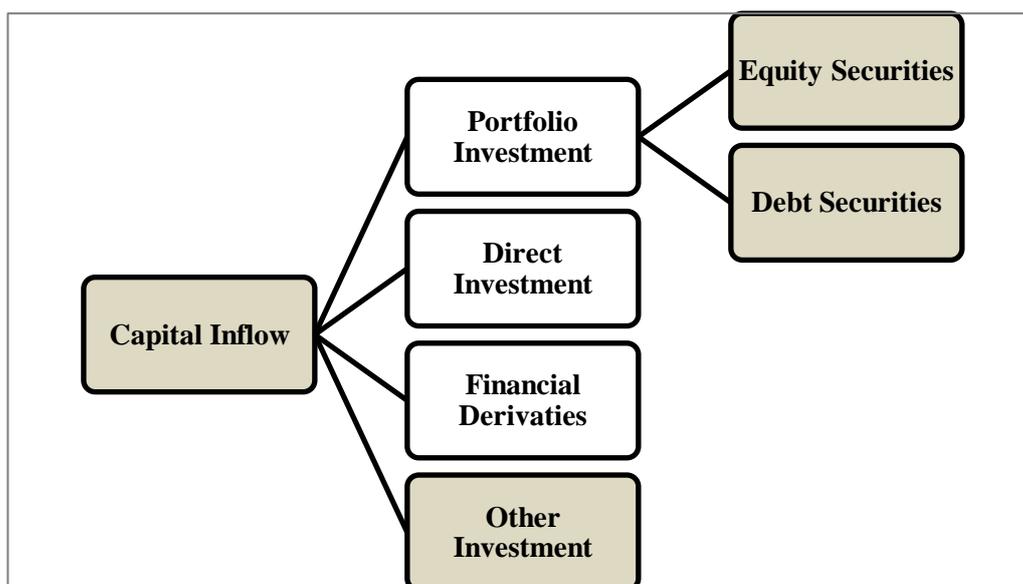
Source: BIS Global liquidity indicator and calculated by the author

derivatives occupies the smallest part of the capital inflow as even some emerging countries have not reported the capital inflow of financial derivatives to IMF IFS database. Among portfolio investment, equity securities stands for the equity flow while debt securities means the bond flow. Other investment consists of not only bank borrowing but also monetary authorities and general government's loan but this paper it will be regarded the other investment as bank borrowing flow as it occupies big portion of the other investment account.

As previous literatures found, these emerging economies have shown drastic fall in capital inflow during the global financial crisis period.

(2012)'s estimation model, this research set estimation model with several new variables added.

$$
\begin{aligned}
Capital \cdot inflow_{i,t} \\
= \beta_0 + \beta_1 K \cdot Openness_{i,t} \\
+ \beta_2 Exr \cdot appreciation^e_{i,t-1} \\
+ \beta_3 Exr \cdot volatility_{i,t-1} \\
+ \beta_4 GDP \cdot diff_{i,t} \\
+ \beta_5 IR \cdot diff_{i,t} + \beta_6 SPI_{i,t} \\
+ \beta_7 GDP \cdot deflator_{i,t} \\
+ \beta_8 CA \cdot balance_{i,t} \\
+ \beta_9 Global \cdot liquidity_t + \epsilon_{i,t}
\end{aligned}
$$

[Figure 6: Capital inflows to 24 emerging countries 2000 - 2015]
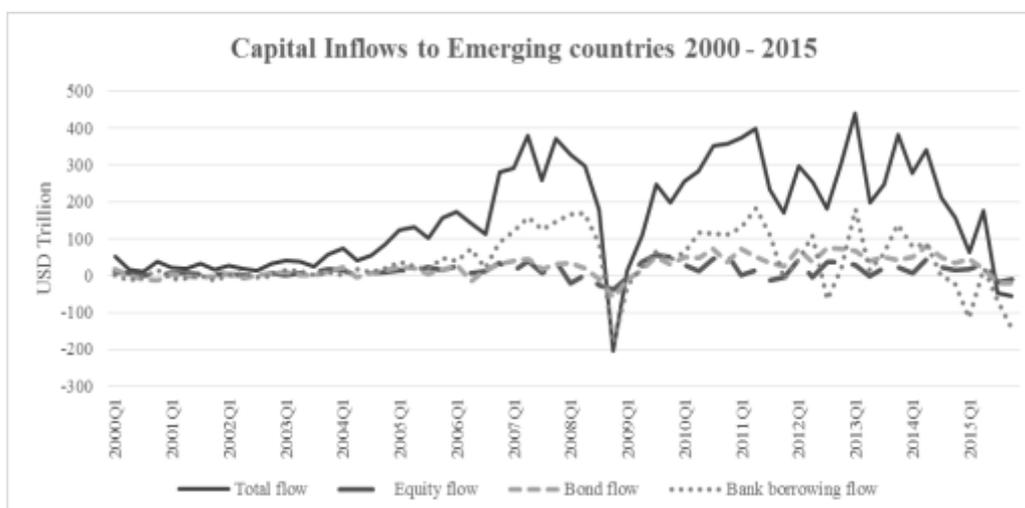
Source: IMF IFS database

[Figure 6] above shows all those 24 emerging countries' capital inflows from 2000 to 2015. Total flow and bank borrowing flow in particular display a sharp plunge in the second half of 2008, which is the sudden stops or reversal of capital inflow. Their capital flows seems to be recovered in the second half of the 2009 but they have been showing huge fluctuations. According to the figure above, total flow and bank borrowing flow have presenting the most volatile movement.

Methodology

Based on the IMF (2010) and Yoon and Kim

The model includes the determinants of capital inflows which are global push, domestic pull and combined factors. For the global push factors, there is global liquidity which is the quantitative index. As mentioned, global liquidity is defined as "G3 currency denominated cross-border credit aggregates" and utilized the global liquidity indicators reported by BIS while public liquidity stands for the M2 of the G3. Thus public liquidity cyclical variation value which is one of the four global liquidity measurements is directly related to the quantitative easing of G3 countries. Those four global liquidity variables are benchmarking Yoon and Kim (2012)'s estimation model.

Global liquidity growth is the growth rate compared to the same quarter in the previous year calculated from the global liquidity indicator of BIS and this value is published by BIS with its original value. The cyclical variation value of global liquidity and public liquidity are the excessing amount of each long-term trend. Lastly, credit multiplier is the value of the global liquidity divided by the public liquidity. It implies that the amount of global liquidity increases when one unit of public liquidity increases so it is showing the impact of the G3's quantitative easing policy on the G3 credit growth.

Although both IMF (2010) and Yoon and Kim (2012) considered VIX as one of the global push factors in terms of capital inflows, this research intentionally excluded it in the estimation model. VIX is volatility index and it has been called "fear index" as it is measuring the investors' expectation of S&P 500 index option's volatility in future 30 days. Accordingly, it represents the market risk denominated by US dollar so it cannot show risks denominated by Euro and Japanese Yen as mentioned. Therefore, in this estimation model, VIX is excluded and stock price index of each emerging country is included instead. Combined factors showing global push and domestic pull aspects together are similar with Yoon and Kim (2012) which are the GDP and policy rate difference between each emerging country and G3's weighted average value. $IR \cdot diff_{i,t}$ is the difference between each emerging country's policy rate and G3's policy rate and the same logic is applied to the $GDP \cdot diff_{i,t}$. If these value is higher, capital is expected to inflow to the emerging country. For domestic push factor, six variables which are three factors that Yoon and Kim (2012) utilized and new three factors are included in the model. As mentioned, capital market openness, expected exchange rate appreciation and exchange rate regime are the old ones while

stock market index, price value measured by GDP deflator and current account balance are the newly added variables. $K \cdot Openness_{i,t}$ stands for the capital market openness which is Chinn-Ito Index[2] and this is expected to encourage capital inflows to emerging countries. Expected exchange rate appreciation which is $Exr \cdot appreciation_{i,t-1}^e$ implies additional profits for international investors if they withdraw their investment later so it can be interpreted that it encourage more investments to emerging countries. Exchange rate regime is substituted by $Exr \cdot volatility_{i,t-1}$ which is measured by four quarters moving standard deviation of the exchange rate. Different from $Exr \cdot appreciation_{i,t-1}^e$, more exchange rate volatility discourages the investment toward emerging countries according to Ghost et al (2012). Even though these two variables come from same exchange rate values, they affect capital inflows differently and that is why Yoon and Kim (2012)'s estimation is more accurate than IMF (2010). As these two exchange rate variables affect investors' decision in next term, they are one term lagged in the estimation model.

Explained those the three variables came from the Yoon and Kim (2012) while following three variables are newly added in this research. As mentioned, VIX was excluded because it cannot measure global risk appropriately, instead stock price index of each emerging country is included. $SPI_{i,t}$ is the one year moving average value of each emerging economy's stock price index. It stands for the each emerging market's risk which will negatively affect capital inflow. Yoon and Kim (2012) developed the estimation model of IMF (2010), but it did not consider price indicator which IMF (2010) had already taken into account. In IMF (2010)'s estimation model, price was considered with the interest rate as the real interest rate. Price is also another essential factor that can represent a market's stability, and literatures that have studied the

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[2] The Index is embodied in the IMF's AREAER(Annual Report on Exchange Arrangements and Exchange restrictions)

capital flows determinants always considered price indicator in diverse ways. Therefore, this research included $GDP \cdot deflator_{i,t}$, which is the inflation rate using GDP deflator growth. The last variable $CA \cdot balance_{i,t}$ is the net asset of current account divided by GDP. Kim et al (2013) considered it one of the the capital inflow's determinant of Korea. Before the Asian financial period, the only macroeconomic indicator that had shown problems was the current account balance. Thus, this element potentially affects investors' decision is included in the estimation model.

Likewise, the paper constructed the estimation model to figure out the relations between global liquidity and capital inflow compared to GDP of emerging countries. According to the Figure 3 and 7, the global financial crisis period from 2008 Q3 to 2009 Q2 is the fiducial time that global liquidity and capital inflows' trends changed. Accordingly, the research will analyze not only all periods but also before and after the global financial crisis period to clarify the effects of the global liquidity on capital flows. Yoon and Kim (2012) also implemented the regression with sub-period before and after the

global financial crisis but it was just about the total flow. In this research, not only total flow but also equity flow, bond flow and bank borrowing flow will be analyzed. Based on the figure 3, 4 and 7, capital flows seem to show similar pattern with global liquidity mainly in pre-crisis period while it has been showing corresponding pattern with both global liquidity and public liquidity in certain amount.

In addition, the emerging countries will be analyzed based on the different regions – Asian, Latin American, European countries because of the contagious effect. According to Kim and Rhee (1998), Asian financial crisis occurred because international investors withdrew their money not based on each country's situation but based on the region. That is why there were massive sudden stops and reversal of capital inflow in Asia even though other Asian countries economic situations were not bad to bring up the financial crisis. Therefore, in terms of capital flows regional contexts also need to be analyzed.

Results and Analysis

The research used the panel data of 24 emerging

[Table 4: Regression Table of Total Inflow to 25 emerging countries in all period]

	(1) Total flow	(2) Total flow	(3) Total flow	(4) Total flow
K.openness	0.700	3.298	3.733	3.297
exr_app	-0.00790	-0.00847	-0.00910	-0.00922
exr_vol	-0.00474	-0.0237***	-0.0234***	-0.0234***
gdp_diff	0.621	1.226	1.102	1.074
ir_diff	-1.047	-0.912*	-0.934*	-0.891*
gdpdf	1.244	1.645**	1.637**	1.654**
spi	-0.000297	-0.000940**	-0.000471	-0.000757*
CA_bal	-0.876***	-0.888***	-0.900***	-0.896***
gl_growth	4.845**			
gl_trend		0.00541		
credit multiplier			9.603	
pl_trend				-0.00234
Constant	16.12	35.91***	4.819	35.25***
Observations	1,078	1,123	1,123	1,123
Adj. R-square	0.354	0.28	0.344	0.281

*** p<0.01, ** p<0.05, * p<0.1

countries from 2000Q1 to 2015Q4 and estimated through random and fixed effect GLS regression.[3]

Capital inflows to 24 emerging countries - From 2000Q1 to 2015Q4

There can be diverse interpretation from those multiple control variables, however, this research will mainly focus on the relation between global liquidity and capital inflows. According to the regression results, capital inflows toward 24 emerging countries has been positively and significantly affected by the growth of global liquidity indicator, which means that global liquidity glut actually encourages capital to flow into the emerging countries and if global liquidity shrinks, then the capital from the emerging countries tends to offset its deficiency. Like IMF (2010) and Yoon and Kim (2012) showed, emerging countries' capital inflows can be suddenly reversed or stopped, which means that they are vulnerable to the global liquidity changes. From the regression result of the Table 4, the first hypothesis has been confirmed.

Different from Yoon and Kim (2012)'s results, the excessive trend of global liquidity, public liquidity and credit multiplier do not show significant result both with and without standard error, although their signs of direction are corresponding to each other. This is because the research period is extended from that of Yoon and Kim (2012). This implies that after 4-5 years, although global liquidity level maintains higher than long-term trend, capital inflows to the emerging countries do not significantly increase with the recovery in advanced economies. Increase in global liquidity implies that the developed capital markets including US, Euro Area and Japan are showing favorable turns. So the capital remains in those "domestic" market rather than move to emerging economies. That is why although global

liquidity is showing larger glut than its long-term trend, not all liquidity flow into emerging countries.

Unlike total flow, equity flow and bond flow do not show statistically significant results but interestingly, equity flow has shown significantly negative coefficient (-0.199) without robust standard error . This results are also different from those of Yoon and Kim (2012). In addition, according to the regression equity flow is showing opposite direction to other capital flows, which means when global liquidity increasing speed is higher all types of capital inflow except equity inflow increase while equity inflow rather decreases. The reasons can be following two points. One is that as advanced economies are showing recovery recently and equity is the one reacting the current situation earlier than bond or bank borrowing flow. The other one is that inherent behavior of international investors when they invest in equity. As mentioned, increase in global liquidity implies the good situation of G3 financial markets with potential increasing in stock prices thus equity investors will move their capital from emerging economies to these advanced economies. When global liquidity decreased, exchange rate depreciation for emerging countries usually happen and this is the good time for equity investors to invest to emerging markets with cheaper prices. Therefore the opposite movement of equity flow to the other capital flows is plausible.

As expected, other investments – the bank borrowing flow has shown the highest vulnerability to the global liquidity with the largest coefficient among three capital types. As Yoon and Kim (2012) approved, the bank borrowing is the main culprit of the sudden stops or reversal of capital inflows in emerging countries. So, when it comes to 24 emerging countries, the second hypothesis is also partly confirmed.   And all three types of capital flows

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[3] All regressions rejected null hypothesis of Breusch-Pagan Lagrange Test in 1% significance level, which means that random effect regression is preferred to pooled-OLS. And all regressions rejected null hypothesis of F-test in 1% significance level, which means that fixed effect regression is more applicable than pooled-OLS. Only regressions whose dependent variable is "bb flow" rejected null hypothesis of Hausman test in 5% level. Therefore only "bb flow" utilized fixed effect regression while the others utilized random effect regression.

does not show significance in terms of the cyclical components which means that the third hypothesis is not confirmed regarding 24 emerging countries in all period.

results of before and after the global financial crisis and according to it, total flow toward emerging countries before the global financial crisis was positively affected by the increasing speed of the global liquidity which is the first

[Table 5: Regression Table of Bank Borrowing Inflow to 24 emerging countries in all period]

	(1) Other flow	(2) Other flow	(3) Other flow	(4) Other flow
K.openness	-0.333	1.300	0.741	0.847
exr_app	-0.00184	-0.00179	-0.00213	-0.00191
exr_vol	-0.00319	-0.00329	-0.00319	-0.00326
gdp_diff	0.927***	1.219***	1.134***	1.160***
ir_diff	-0.252	-0.0127	0.0176	-0.00779
gdpdf	0.784***	0.839***	0.863***	0.864***
spi	2.92e-05	-0.000257	-0.000470	-0.000344
CA_bal	-0.379***	-0.395***	-0.394***	-0.395***
gl_growth	1.907***			
gl_trend		0.00241		
credit multiplier			-6.334	
pl_trend				0.00756
Constant	-6.410**	0.146	20.17	-0.0177
Observations	1,054	1,099	1,099	1,099
Adj. R-squared	0.198	0.170	0.170	0.171

*** $p<0.01$, ** $p<0.05$, * $p<0.1$

- Before and after the global financial crisis
It was explicit in Figures 2, 3 and 6 that global liquidity was abundant with massive increase of private credit creation and cross-border credit before global financial crisis. However, it became stagnating after the crisis although public liquidity has been provided massively. As mentioned, capital flows are showing corresponding pattern with global liquidity in pre-crisis and with both global and public liquidity in post-crisis.

This paper estimated the model dividing the period by before and after global financial crisis, which are from 2000Q1 to 2008Q2 and from 2009Q3 to 2015Q4. Based on the sub-period regression, all types of capital flows are affected by global liquidity differently from the before and after global financial crisis.

Table 6 is showing the total flow regression

hypothesis is confirmed again. Before the global financial crisis, when global liquidity growth increases in 1%, capital inflows increases in 6.5% However, the coefficient became minus term so capital inflow decreases in 5.2% when same amount of global liquidity growth increases after global financial crisis, which is showing that the first hypothesis is not right. This implies that advanced economies was quite recovered than before so liquidity rather moves back to or stay in the G3 economies.

In addition, in both before and after period, total flow is negatively affected by the credit multiplier, while it positively affected by the cyclical component of public liquidity. This implies that after the crisis, creating private liquidity became limited so global liquidity glut weakened while enormous increase in public

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[Table 6: Comparing Regression Table of Total Inflow to 24 emerging countries

before and after the global financial crisis]

	Before				After			
	Total flow	Total flow	Total flow	Total flow	Total flow	Total flow	Total flow	Total flow
K.openness	22.08**	24.48***	19.98**	24.55***	-7.567	-7.341	-6.479	-6.900
exr_app	-0.0377	-0.0382	-0.0352	-0.0371	0.00624*	0.00688*	0.00617	0.00704*
exr_vol	-0.0121	-0.0188***	-0.0165***	-0.0181***	0.0159*	0.0276***	0.0345***	0.0305***
gdp_diff	-1.036	-0.304	-1.630	-0.382	-1.919**	-0.487	-1.137	-0.362
ir_diff	-1.053*	-0.902**	-0.775**	-0.865**	-2.173	-1.641	-1.282	-1.388
gdpdf	1.033**	1.095*	1.024**	1.069*	1.523**	1.149	0.569	0.946
spi	-0.00412**	-0.000332	-0.00207**	-0.000448	-0.000561	-0.00152*	-0.000852	-0.00132
CA_bal	-0.683***	-0.731***	-0.719***	-0.730***	-0.404**	-0.382**	-0.343**	-0.370**
gl_growth	6.486**				-5.199**			
gl_trend		-0.000950				0.00922**		
credit multiplier			-74.87**				-60.92***	
pl_trend				0.0172**				0.0624***
Constant	8.940	49.83***	302.5***	50.79***	55.68***	42.41***	222.6***	38.57***
Observations	548	593	593	593	454	454	454	454
Adj. R-Squared	0.373	0.325	0.345	0.329	0.16	0.145	0.235	0.164

*** p<0.01, ** p<0.05, * p<0.1

liquidity caused by quantitative easing from major economies encouraged capital inflows to emerging economies. The cyclical component of global liquidity does not show significance before period while it became positively significant in after period, which implies that total flow became more vulnerable to the higher level of global liquidity than long-term trend. Total flow can be reversed now not by the increasing speed of the global liquidity but by the cyclical component of the global liquidity. This implies that after the crisis, those emerging economies became more pro-cyclical with global liquidity so more integrated with the G3 economies.

Then which type of capital is the main cause of the total flow pattern is another important question. For the pre-crisis period, other flow which is the bank borrowing flow is the most vulnerable to the global liquidity increasing speed while all global liquidity variables cannot explain equity and bond flow in pre-crisis period. In post-crisis period, the main cause that changed the sign of coefficient of global liquidity increasing speed is also the other flow. The coefficient of other flow is reversed and shows statistically significant. Therefore, other flow which is the bank borrowing flow is the most vulnerable to the increasing speed of the global liquidity but its effects are contrary from pre and post crisis period.

Unlike to Yoon and Kim (2012)'s findings, bank borrowing flow does not have the highest pro-cyclicality. After the global financial crisis, equity flow shows the highest pro-cyclicality with the significantly positive coefficient. Regarding equity flows, global liquidity cannot explain its flow well in the pre-crisis period while except global liquidity growth, the other three variables show significance in the post-crisis period. Equity became more corresponding to global liquidity compared to

before the global financial crisis, especially to the cyclical component of global liquidity. This result can support the literatures which have proved that international investors' behavior in the global financial crisis period expanded the volatility and vulnerability in emerging equity markets as it became more integrated with advanced equity markets. (Kang and Yoon, 2011; Kim and Lee, 2013; Jo and Kim, 2016) And also this can be associated with the some emerging countries' portfolio outflow liberalization as CGFS (2009) explained. While the bank borrowing flow was the main cause of vulnerability before the global financial crisis, equity and bond flow became the main cause of the volatility regarding the global liquidity. Both equity and bond flow are showing significantly negative coefficient and significantly positive coefficient corresponding to total flow in the post-crisis period. As mentioned, this implies that some portion of liquidity provided by quantitative easing of G3 flows into emerging countries through equity and bond.

Likewise, when analyzing the relation between capital flows and global liquidity, the second hypothesis and the third hypothesis is not clearly confirmed. Those regression results are showing so diverged pattern in terms of vulnerability and pro-cyclicality. Therefore, the analysis on capital flows have to be analyzed not only in the lump as IMF (2010) and Yoon and Kim (2012) did but also in separated way as this research has implemented. Therefore, following regional analysis will focus on which capital type show the highest vulnerability and pro-cyclicality in which period and which region.

Capital inflows to Asian countries
Before Asian financial crisis occurred, many East Asian countries had shown fine performances in terms of macroeconomic fundamentals except slight deficit of current account balance according to Kim and Rhee (1998). However, the Baht crisis in Thailand in July 1997 was spread throughout the Asian region between 1997 and 1998 because international investors withdraw their money not from the Thailand but from the Asian region. They are inclined to form their investment portfolio not based on the country but based on the region. Thus, when Thailand financial market showed some problems the capital flew away to outside of Asian financial market. Therefore, regional contexts and features have to be concerned when it comes to capital flow and especially to emerging economies. This paper estimated same panel regression but applied to each Asian, Latin American and Eastern European region. Each region is showing different patterns of capital flow associated with global liquidity.

Asian emerging economies were truly vulnerable to global liquidity before the crisis according to the regression results. According to [Table 7], total inflows to 8 Asian countries was significantly positively affected to the increasing speed of the global liquidity and regarding the coefficient of credit multiplier and the cyclical component of public liquidity also showed corresponding results to those of the all emerging countries. However, in the post-crisis period, all significances regarding the global liquidity disappeared and Asia is the only region that all significances disappeared after the global financial crisis among the three regions.

According to Heng (2009), Asian countries' capital flows were less exposed to the global liquidity after the global financial crisis because of following two reasons. First is that Asian countries had few "inherent sources of vulnerabilities" unlike to the Asian financial crisis. Through the comprehensive reform measures responding the Asian financial crisis, many weakness such as credit excesses and currency mismatches that prevailed during the Asian crisis were hugely gone. In addition, high debt-to-equity ratio and the ratio of nonperforming loans were sound based on the IMF and World Bank's report. [4]

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[4] Heng, Global Financial Crisis, 269.

[Table 7: Comparing Regression Table of Total Inflow to 8 Asian countries before and after the global financial crisis]

	Before				After			
	Total flow	Total flow	Total flow	Total flow	Total flow	Total flow	Total flow	Total flow
K.openness	11.29	13.17	5.032	12.22	-21.77**	-21.59**	-20.42**	-21.00**
exr_app	0.0281***	0.0368***	0.0353***	0.0381***	0.0107*	0.0113*	0.00976	0.0103
exr_vol	-0.102***	-0.119***	-0.0844***	-0.105***	0.0431	0.0439	0.0470	0.0468
gdp_diff	-0.946	-0.0927	-1.661*	-0.422	0.874	1.098	0.913	1.515
ir_diff	0.00972	0.911	0.733	0.527	4.574*	4.086	4.740*	4.027
gdpdf	1.049	0.642	0.277	0.457	0.703	0.847	0.0517	0.600
spi	-0.00219	-0.00157	-0.00231	-0.00161	-0.00321***	-0.00314***	-0.00309***	-0.00307***
CA_bal	0.153	0.163	0.148	0.148	0.280	0.276	0.293	0.290
gl_growth	1.890*				0.204			
gl_trend		0.00125				0.00587		
credit multiplier			-67.89**				-48.18	
pl_trend				0.0359***				0.0558
Constant	13.68	22.10	251.7**	26.43*	-7.344	-5.286	138.1	-7.984
Observations	178	190	190	190	162	162	162	162
Adj. R-squared	0.231	0.174	0.191	0.189	0.285	0.289	0.287	0.295

The other reason is the appropriate and timely fiscal and monetary policy responses by Asian governments. Heng (2009) saw that this was possible because Asian governments implemented exactly opposite policies to those that IMF recommended during Asian financial crisis. They already recognized the global financial crisis is nothing but the liquidity problem. Therefore liquidity provision was the main fiscal expansionary policy and US$700 billion was provided in Asia region consisted by US$586 billion to China, the 12 percent of China's GDP, US$53 billion to Korea, the 6.8 percent of Korean GDP, US$18 billion to Malaysia, the 10 percent of Malaysian GDP, and US$6 billion to Indonesia, the 1.3 percent of Indonesian GDP.[5] Monetary policies were also followed in line with lowering interest rate supporting domestic demand and preventing massive layoffs. [6] At the time of Asian financial crisis, IMF forced to raise the interest rate and maintain in high level to prevent international investors to leave but in reality many companies went bankrupt as they could not afford that much high interest rate.

However, it does not imply that 8 Asian emerging economies became fully impervious to the global liquidity. Based on [Table 8] and [Table 9], bank borrowing flow and bond flow were the main culprit in terms of vulnerability in the pre-crisis period considering the coefficient, which means that second hypothesis can be confirmed in Asian region before the global financial crisis and still the region hold the potential danger in these two capital types even though it is the only region where all significances are gone after global financial crisis. The chronic problem that bank borrowing has in Asian emerging countries does not solve at all and even it showed the more vulnerability to the cyclical component of the global liquidity and bond flow actually is more affected to the cyclical component of the global liquidity than bank borrowing flow. Thus, the third hypothesis also can be seen as confirmed in Asian emerging

countries in post-crisis period.

Capital inflows to Latin American countries

As [Table 10] shows, Latin counties also has shown similar capital inflows pattern with Asian countries before the global financial crisis. In addition, Latin is the most vulnerable region in terms of global liquidity both in pre and post crisis period. This because many Latin American countries have been dependent on the huge foreign borrowing to offset their current account deficit and to adjust the exchange rate. This is one of the inherent problems that emerging Latin economies hold and they have still been struggling since the Lain debt crisis. Like to the emerging Asian countries, the bank borrowing flow was the main culprit that positively affected by the increasing speed of the global liquidity it was truly strong that the coefficient of it is much bigger than that of Asian countries before the global financial crisis and bond flow was the main cause that total flow was positively affected by the cyclical component of the global liquidity. In sum, before the crisis, bank borrowing was the most vulnerable followed by bond and equity while bond was the most pro-cyclical followed by bank borrowing and equity.

In the post-crisis period, the capital inflows to Latin American countries are showing same line with the all emerging countries which are negative direction of credit multiplier's coefficient and positive direction of the "pl_trend" coefficient. Among three capital flows, no specific capital types are showing the differentiated movement rather Latin American countries' capital inflow is now affected by the public liquidity.

Capital inflows to eastern European countries
East European is the least vulnerable region regarding global liquidity as they do not show significance in terms of global liquidity indicators, which means that they were

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[5] Leftovers were for Singapore (US$14 billion, 8 percent of GDP)

[6] Heng, Global Financial Crisis, 270.

[Table 8: Comparing Regression Table of Bank Borrowing Inflow to 8 Asian countries before and after the global financial crisis]

	Before				After			
	Other flow	Other flow	Other flow	Other flow	Other flow	Other flow	Other flow	Other flow
K.openness	-6.905	-14.99	-16.52	-13.23	3.735	3.661	4.193	4.333
exr_app	0.000357	0.00555	0.00561	0.00722	0.00195	0.00237	0.00190	0.00147
exr_vol	-0.0633**	-0.0524*	-0.00994	-0.0370	0.00493	0.00385	0.00375	0.00410
gdp_diff	1.940**	1.640*	-0.124	1.304	1.567**	1.608***	1.423**	1.869***
ir_diff	6.343***	3.643*	2.618	2.793	2.945	2.210	2.823	2.446
gdpdf	0.0942	1.465*	1.184	1.419*	-0.0237	0.102	-0.0437	-0.0509
spi	-0.00184	-0.000766	-0.00229	-0.00123	-0.000306	-3.82e-05	8.49e-05	0.000215
CA_bal	-0.206**	-0.188*	-0.184*	-0.192*	-0.283***	-0.294***	-0.282***	-0.277***
gl_growth	4.170***				0.633			
gl_trend		0.00245				0.00493*		
credit multiplier			-68.77***				-6.250	
pl_trend				0.0249**				0.0339**
Constant	-54.04***	-24.82**	211.9***	-19.61*	-4.230	-0.191	15.87	-3.781
Observations	178	190	190	190	138	138	138	138
R-squared	0.132	0.084	0.158	0.114	0.189	0.208	0.189	0.218

*** $p<0.01$, ** $p<0.05$, * $p<0.1$

[Table 9: Comparing Regression Table of Bond Inflow to 8 Asian countries before and after the global financial crisis]

	Before				After			
	Bond flow	Bond flow	Bond flow	Bond flow	Bond flow	Bond flow	Bond flow	Bond flow
K.openness	11.86**	12.76**	10.14*	12.62*	0.899	0.667	0.931	0.794
exr_app	0.0143***	0.0177***	0.0149***	0.0161***	0.00276*	0.00300*	0.00206	0.00266
exr_vol	-0.0386***	-0.0448***	-0.0284**	-0.0361***	0.0169	0.0208	0.0251*	0.0218
gdp_diff	0.110	0.451	-0.274	0.169	-0.731***	-0.105	-0.183	0.0165
ir_diff	1.380	1.139	0.688	0.622	-0.121	-0.252	0.0991	-0.249
gdpdf	-0.737	-0.377	-0.379	-0.324	-0.161	-0.257	-0.749	-0.305
spi	0.000336	0.00181	0.00125	0.00202	-0.000240	-0.000273	-0.000210	-0.000251
CA_bal	0.0516*	0.0686	0.0571	0.0579	0.00290	0.0343	0.0625	0.0433
gl_growth	2.323*				-2.206			
gl_trend		0.00812*				0.00241*		
credit multiplier			-23.54				-34.40*	
pl_trend				0.00905*				0.0206
Constant	-6.925	7.777	87.54	9.274	16.80***	9.777*	111.4*	8.455
Observations	141	150	150	150	136	136	136	136
R-squared	0.149	0.106	0.101	0.093	0.22	0.217	0.222	0.23

*** p<0.01, ** p<0.05, * p<0.1

[Table 10: Comparing Regression Table of Total Inflow to 8 Latin American countries before and after the global financial crisis]

	Before				After			
	Total flow	Total flow	Total flow	Total flow	Total flow	Total flow	Total flow	Total flow
K.openness	12.37**	8.279	8.832*	8.381	20.80***	19.86***	21.47***	20.33***
exr_app	0.0610***	0.0458***	0.0359**	0.0378*	0.00820***	0.00858***	0.0146***	0.0120***
exr_vol	0.00930***	-0.0188***	-0.0184***	-0.0179***	0.201	0.228*	0.246*	0.241*
gdp_diff	-1.106*	-0.491	-0.127	-0.549	-0.654	0.282	-0.757	0.222
ir_diff	-0.290	-0.828	-0.699	-0.722	0.144	0.264	0.994	0.448
gdpdf	-0.425	-0.472	-0.546	-0.566	0.869	0.639	0.427	0.611
spi	0.0110	0.00938	0.0109	0.0107	0.00638**	0.00577**	0.00688***	0.00603**
CA_bal	-0.599***	-0.201	-0.257	-0.260	-1.045***	-0.998***	-0.985***	-0.975***
gl_growth	4.489***				-2.882			
gl_trend		0.0156**				0.00683		
credit multiplier			27.02**				-69.06***	
pl_trend				-0.0203				0.0549***
Constant	4.561	45.83***	-47.04	42.82***	12.33	7.811	207.2***	3.911
Observations	170	185	185	185	132	132	132	132
R-squared	0.254	0.201	0.192	0.197	0.376	0.373	0.409	0.385

*** p<0.01, ** p<0.05, * p<0.1

relatively unexposed to the global liquidity. As seen in [Table 11], the public liquidity indicators explain the capital inflows toward the European countries well. The reason for this is that those emerging European economies are already linked to and integrated with the developed European economies so the impact from the global liquidity is comparatively smaller. Among eight countries in the research target, five countries (Bulgaria, Poland, Hungary, Romania, Slovenia) are EU members and among these five countries, three countries (Hungary, Poland, Romania) are applying for the Eurozone and one country (Turkey) is trying to be a member of EU. Considering these facts, it is not surprising that these emerging countries are relatively not influenced by the global liquidity but by the public liquidity.

According to the regression results based on the capital types, bank borrowing flow is the key capital types the most affected by the increasing speed of the global liquidity and its coefficient signs (3.462) are corresponding with those of the all emerging countries' regression.

In the emerging European market, the potential risk is implicit in the equity flow with positive coefficient in terms of the cyclical component of the global liquidity. This is the drastic change between before and after crisis period. IMF (2012b) cited Becker et al (2010) and explained that fiscal policy was pro-cyclical in many central, eastern and southeastern European countries. Based on the IMF (2012b)'s citation, Becker et al (2010) insisted that the policy was not the main culprit of the increased vulnerabilities but it was not helpful to prevent the expansionary credit growth or alleviate the economic boom.[7] The pro-cyclical fiscal policy was for attracting foreign capital to promote their economic growth and for meeting the Eurozone member standard. However those fiscal policies were not adjusted during the global financial crisis period and huge official

financing from international institutions were just provided to the emerging European countries. [8] As the pro-cyclical fiscal policy has been staying especially with huge liberalization of equity market, after the crisis, equity became vulnerable to the global liquidity.

Conclusion

Findings

This research tried to find out the relation between the global liquidity and capital flows toward emerging countries. Recently, the global liquidity has been blamed for the spreading shock to the world economies and when it hit the capital flows of the emerging economies, the markets had to suffer from the financial crisis. Therefore the relation between global liquidity and capital flows have to be studied to prevent or predict future financial crisis which can be influential as much as or more than the global financial crisis in 2008.

Through the literature review, this research found global push factor and especially global liquidity is important when it comes to capital flows regarding the financial crisis. Although some previous literatures measured the global liquidity with diverse proxies, they are somewhat limited to explain capital flows appropriately. Therefore this research utilized the global liquidity indicator from BIS which is the quantitative index but not usually used in the previous literatures.

And with the global liquidity indicator, this research has constructed the estimation model. This benchmarked the models of IMF (2010) and Yoon and Kim (2012) but it was the developed version. First of all, VIX was excluded although IMF (2010) and Yoon and Kim (2012) utilized it as one of the control variables. VIX is volatility index showing the risk denominated by US dollar, so it cannot show other risks from Euro and Japanese Yen

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[7] IMF, the 2008/09 crisis, 19.
[8] According to the IMF (2012b), four countries including

Hungary, Ukraine, Romania, Turkey among the research target received the external financing.

[Table 11: Comparing Regression Table of Total Inflow to 8 European countries before and after the global financial crisis]

	Before				After			
	Total flow	Total flow	Total flow	Total flow	Total flow	Total flow	Total flow	Total flow
K.openness	11.38	13.83	9.477	13.99	-6.087	-6.915	-7.385	-6.589
exr_app	-0.137***	-0.151***	-0.141***	-0.148***	0.0158	0.0173	0.0175	0.0197
exr_vol	-1.595	-2.067	-1.360	-1.965	-3.837***	-3.035***	-3.116***	-3.020***
gdp_diff	0.805	2.014	-0.496	2.206	-3.603**	-2.177*	-2.761***	-2.162***
ir_diff	-3.601***	-1.857*	-1.619	-1.788	-2.310	-1.353	-1.456	-1.138
gdpdf	3.353**	2.307	2.092*	2.166	3.522*	2.833	2.526	2.644
spi	0.0319	0.160	0.131	0.160	0.322*	0.337*	0.314	0.341*
CA_bal	-0.686**	-0.776**	-0.751**	-0.762**	-0.575**	-0.598**	-0.574**	-0.595**
gl_growth	9.383				-11.40**			
gl_trend		-0.0190				0.0106		
credit multiplier			-150.5*				-34.08	
pl_trend				0.0295*				0.0603
Constant	22.86	67.49***	577.5**	71.65***	41.46	10.03	113.0	6.204
Observations	200	218	218	218	160	160	160	160
Number of ccode	0.431	0.381	0.404	0.381	0.268	0.247	0.244	0.248

*** p<0.01, ** p<0.05, * p<0.1

that occupies half of the global liquidity index. In addition, this research added newly other three variables stock price index, price index by GDP deflator and current account balance of the emerging countries. These three are frequently appear in the literatures studying capital flows determinants, but they are not included in both IMF (2010) and Yoon and Kim (2012). As mentioned, VIX was excluded instead $SPI_{i,t}$, the stock price index of each emerging country is included measuring the each emerging market's risk. $GDP \cdot deflator_{i,t}$, is the price indicator stands for the each market's stability. Any price indicator was not included in Yoon and Kim (2012) while IMF (2010) took it into account as the real interest rate. The last variable $CA \cdot balance_{i,t}$ is also a sign of each economy's stable development and this was proved to be crucial in Asian and Latin American regions. With the developed estimation model, this research has implemented the panel regression of capital inflows into 24 emerging countries from the first quarter in 2000 to the fourth quarter in 2015. According to the regression results, this research also confirmed that the global liquidity positively affects the capital flows into the emerging countries as previous literature IMF (2010) and Yoon and Kim (2012) have found. In other words, the global liquidity glut encourages capital to flow into the emerging countries and if global liquidity shrinks, then the capital from the emerging countries tends to offset its deficiency and this findings implies that emerging countries' capital inflows can be suddenly reversed or stopped which can occur financial crisis in those countries.

Considering the Figure 2, 3 and 6, the capital flows into the emerging countries seems to show corresponding pattern with the global liquidity growth before the global financial crisis. On the other hand, it seems to have similar pattern with both global and public liquidity growth after the global financial crisis, which is different pattern from the pre-crisis period. Accordingly, this research implemented the regression dividing

the period into before and after the global financial crisis. Yoon and Kim (2012) also estimated the pre and post-crisis regression, but it only dealt with the total flow while this research estimated equity flow, bond flow and other flow regressions also. According to the regression results, capital inflows in pre-crisis period was positively affected by global liquidity growth but its coefficient sign was reversed to negative in post-crisis period. This implies that after the crisis the capital created by the global liquidity stays in or moves back to advanced countries as G3 countries have been recovered from the crisis.

In addition, the cyclical component of global liquidity does not show significance before period while it became positively significant after the crisis. This implies that total flow was vulnerable to the increasing speed of the global liquidity before the crisis but after that it is rather pro-cyclical to the global liquidity. This implies that after the crisis, those emerging economies became more pro-cyclical with global liquidity and more integrated with the G3 economies.

Regarding capital type analysis in before and after regression, bank borrowing is decidedly the most vulnerable and the most pro-cyclical capital type before the global financial crisis. However, the most vulnerable or the most pro-cyclical capitals are so diverged after the global financial crisis in terms of the region.

The biggest contribution of this paper is that it estimated the capital inflows not only based on the capital types but also on the regional classification. This research implemented regional regressions with the sub-periods also in order to find out the regional contexts in terms of capital flows reminding of the Asian financial crisis. Asia is the only region where vulnerability and pro-cyclicality regarding the global liquidity became the weakest after the crisis. Still the chronic problem in bank borrowing is implicit and potential risk in bond flow is presented. Latin is the most vulnerable region among three and the main culprits were bank borrowing and bond. This is because the

region has been highly dependent on the big foreign borrowing to offset their current account deficit and to adjust the exchange rates.

East Europe is the region that is relatively less affected by global liquidity as most emerging countries are EU members or the candidates. Accordingly, their economies were already integrated with Euro market. However, in post-crisis period, there is potential risk in equity because of the pro-cyclical fiscal policy. The emerging European countries have implemented those policies to achieve two goals – attracting foreign capital to boost their economies and meeting the entering standard of EU and Eurozone. According to IMF (2012b), these policies were not adjusted or eliminated during the global financial crisis unlike to Asian countries. IMF (2012b) also explained that emerging European countries just escaped from the crisis through official financing from the international institutions.

In sum, this research reconfirmed the influence of the global liquidity toward the capital flows of the emerging countries and found the different patterns of capital movement based on the regions and capital types.

Implications

As mentioned, financial crisis is the critical event because the economy has to suffer from serious problems but can seized the opportunity to reform its economic system to solve its chronic problem. That is why the global financial crisis was the fiducial point in this research.

This research is meaningful in following points. Firstly, it confirmed the relation between the global liquidity and capital flows as previous literatures have insisted with new and quantitative index – the global liquidity index from BIS. 24 emerging countries could not help getting hit by global shock from the US because of the global liquidity's impact. This is showing that one of the capital inflows determinants toward the emerging countries is the global liquidity which has been created by the advanced countries. For the emerging countries, not only the monetary and fiscal policy of the

advanced countries but also the market situation of the G3 economies are influential.

Second, it confirmed that bank borrowing is the most vulnerable and sensitive capital type in emerging countries especially before the global financial crisis. Even Asia where all vulnerability and pro-cyclicality are weakened after the crisis, the chronic vulnerability is still implicit in the bank borrowing flow. This implies that for the emerging countries, bank borrowing flow has to be observed and monitored to prevent capital flight following the global and public liquidity pattern.

Lastly, it suggests the potential risks are all different from the regions. Asia still hold its implicit risk in bank borrowing flow in terms of vulnerability. In case of the pro-cyclicality, bond flow is corresponding to the global liquidity in Asia while east Europe has potential pro-cyclical risks in equity flow. This is confirming that regional contexts have to be considered regarding the capital flows. As mentioned, the reason why east Europe has shown the least vulnerability among three regions is that the region is more or less integrated and linked with the Eurozone market. In other words, it is relatively less affected by Euro risk, which can be interpreted as regional market integration could be the preventive measures against the external shock.

Although there are insufficient literatures whether regional market integration can be the precaution of the financial crisis relate to the capital flows, financial regionalism and the financial crisis seems to be associated with each other. Emmers and Ravenhill (2011) compared the impact of the Asian financial crisis in 1997-1998 and the global financial crisis in 2008 on the East Asian regionalism. The article found that ASEAN Plus Three – China, Japan and the Republic of Korea (APT) started to take initiative after Asian financial crisis because there have been failed response of APEC and ASEAN. On the other hand, Chiang Mai Initiative (CMI) became more multilateral during the global financial crisis. Emmers and Ravenhil (2011) concluded that two crises encouraged the three countries – China, Japan

and Korea to be more institutionalized and more influential in East Asian region. Based on the analysis, if Asian financial market is more integrated to prevent the risk from the global liquidity, CJK-centered regionalism might be able to appear. Therefore, based on the regression results of this paper, further analysis of regional market integration can be developed.

Limitations

Despite the findings and implications this research has, the research still has some limitations that further researches might be able to develop. First of all, the global liquidity indicator from BIS itself was limited. BIS has provided the global liquidity indicator since 2000 thus it was impossible to check whether the global liquidity affect the capital flow only during the global financial crisis or not. Comparing with other financial crises can be the good development in terms of the relation will be the meaningful extension.

And when it comes to the negative coefficient of the increasing speed of the global liquidity growth in post-crisis period, the explanation was limited. It has been visible in market situation that G3 economies were recovered so capital moves back from Asia and Latin countries or stay in the advanced countries and the capital movement between US and Europe is clearly becoming brisk. However, the capital from east European countries to west European countries which is the regression result might imply is not fully explained. In the estimation model the rate of return was not included as the control variables but this variable might can explain the capital flow of east Europe more appropriately.

Acknowledgements

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