THE EFFECT OF SWAP LINE ESTABLISHMENT TO DEVELOPING COUNTRIES PORTFOLIO FLOWS IN SUBPRIME MORTGAGE CRISIS

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Abstract

This paper tries to investigate the effect of swap line establishment to the portfolio flows to developing countries in the subprime mortgage crisis. This issue is interesting to investigate because the swap line establishment is relatively new phenomenon in the international financial resolution. It also involve major economic powers as the partner of developing countries in this arrangement. Sample of this research consist of 64 developing countries and the observation period year is 2009. The quantitative approach specifically regression analysis is chosen to obtain the result. From the analysis result reveals that the swap presence has no effect to the portfolio flows to the developing and emerging market. The swap partner statistical result is more convincing; but the relationship is weak it is significant at the alpha 10 %. And finally the swap amount provide much better result, it has the highest relationship significant at the alpha of 1 % with the portfolio flows to developing countries.

***Keywords** : swap line, portfolio flows, developing countries, subprime mortgage crisis*

Abstraksi

Tulisan ini mencoba untuk menganalisis pengaruh dari pembentukan jalur swap terhadap arus portofolio menuju negara berkembang dalam krisis subprime mortgage. Isu ini menarik untuk dipelajari karena pembentukan jalur swap adalah fenomena yang relatif baru dalam penyelesaian permasalahan keuangan internasional. Hal ini juga melibatkan kekuatan-kekuatan ekonomi besar sebagai partner dari negara-negara berkembang dalam perjanjian ini. Sampel dalam penelitian ini terdiri dari 64 negara berkembang dan periode pengamatan adalah tahun 2009. Pendekatan kuantitatif secara lebih spesifik yaitu analisis regresi dipilih untuk mendapatkan hasil perhitungan. Dari hasil perhitungan mengungkapkan bahwa pembentukan swap tidak memiliki pengaruh terhadap arus portofolio ke negara berkembang. Hasil statistik dari swap partner lebih meyakinkan, walaupun hubungannya lemah signifikan pada alpha 10 %. Dan terakhir nilai swap memberikan hasil yang lebih baik, memiliki hubungan yang lebih erat signifikan pada alpha 1 % dengan aliran modal menuju negara berkembang.

***Kata kunci** : jalur swap, arus portofolio, negara berkembang, krisis subprime mortgage*

INTRODUCTION

A large scale of capital flow especially to developing and emerging economies in the world financial system has been a common phenomenon in the last several decades. Many experiences have revealed the adverse effect of this flow when it reverses and bring countries to the financial crisis. Calv, *et al* (2004) indicate that this "sudden stop" really harmful and basically an emerging market phenomenon. That is the condition when the sudden reversals in capital flow happened in the middle of pressure to central bank to repay the short term foreign denominated debt that is not rolled over. Therefore this resurgence of international capital flows to the emerging countries are seen as one factor that caused the financial crisis.

Many episodes of financial crisis that hit developing and emerging countries are the evidence of that swing of international capital flows. And the latest subprime mortgage crisis 2008 cannot be separated as one of the incident of international capital flows movements. Although the epicentrum of the subprime mortgage crisis was United States, one of the developed countries, but the deteriorated effect also struck the developing countries. As example for this reality, According to the data from the world bank, the portfolios net inflow to the developing East Asia and Pacific countries in the peak of the subprime mortgage crisis is minus 7,326 billions US Dollar, while in the year 2007 the amount of capital flows were still positive at the level of 35,093 billions US Dollar.

There are two dominant factors which are commonly recognized as the determinant of the capital flow movement across countries. Because of their differences, they are usually called the push and pull factors. The push factors are the condition in global economics that activate the capital flows movement, such as the abundant liquidity in developed economies and the prospect of the advanced economies. On the other hand there is a pull factors which describe the domestic condition of the recipient countries. Some circumstances like the growth prospects of the countries and the return differential to the advanced economies can be categorized as the pull factors.

Moreover in the financial crisis event, the pattern of capital flows is different from the normal condition. In such circumstances the contagion effect among countries becomes stronger, and also there is a significant change in the international liquidity stocks and the risk escalation becomes higher. If the capital flows from the advances Economies to the Emerging market Economies before the crisis occurred, contrary to that pattern, the capital will be reallocated from the emerging market Economies to the Advanced Economies during the crisis event. Fratzscher (2011) found that the push factors were overall the main drivers of capital flows during the crisis, while pull factors have been dominant in accounting for the dynamics of global capital flows in 2009 and 2010, in particular for emerging markets.

There are differences among many types of capital flows, foreign direct investment is usually considered stable while portfolio investment is frequently depicted as the least reliable type of flow. Recent statistical testing has yielded conflicting results on this issue. Major problem with recent studies is that the degree of variability of capital flows during normal or inflow periods may give little clue to their behavior during crises and it is the latter that is most important for policy. Using data for 35 emerging economies for 1990 through 2003, Sulla and Willett (2007) confirmed that direct investment is the most stable category, and portfolio flows are reversible. So in this research the writer will focus to study not all types of capital flows, but limited the investigation to the portfolio flows.

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To avoid the sudden stop or the reversal of capital inflow during the crisis event many actions could be taken. One of the popular ways especially for the developing and emerging market is by hoarding international reserves, these reserves is usually used to intervene the money market and make the exchange rate of that country much more stable. When the massive capital flows outside the country in the "flight to safety" effort, it will pressure the exchange rate of country's currency. In the Subprime Mortgage crisis 2008, there is an interesting phenomenon related to the anticipation of the capital flows reversal, during this crisis many countries established what is called the swap line. That is the accord among the central banks to swap international reserves when the capital flow reversal came. The starting point of the international swap line was the Chiang May Initiatives (CMI), which is essentially a network of bilateral currency swaps and repurchase agreements as a "firewall" against future financial crises with the limited members in the South East Asia. But the most intriguing event took place at the end of October 2008, when the US Federal Reserve (FED), the central banks of Brazil, Mexico, Korea, and the Monetary Authority of Singapore announced the establishment of temporary reciprocal currency arrangements or swap lines, worth US$ 30 Billion each. The ECB also involved in this activities by provide credit lines during the first quarters of the crisis to Hungary and Poland with repo lines (Euros in exchange for eligible collateral), of €5 and €10 Billion, respectively. In the East Asia the Bank Of China provided significant CNY swap lines to its trading partners CNY 70, 200, 100, 180, 80 Billions to Argentina; Hong Kong, China; Indonesia; Korea; and Malaysia, respectively.

This paper is unique, because it wants to asses a relatively new phenomenon which is seen in the subprime mortgage crisis series namely the swap lines. The presence of swap line in subprime mortgage crisis period is interesting to be revealed. Although Aizenman, *et al* (2010) stated that there is only a limited scope for swaps to substitute for reserves, for details many swap arrangements have been agreed, but there was none withdrawal conducted during subprime mortgage crisis. It seems like that the swap arrangement intentionally made to influence the market psychological trust, but not to be applied in a real condition. However, this swap line arrangement in fact effectively influences money market improvement in certain countries. One of the persistent examples is Korea, despite having one of the world's largest stocks of FX reserves and comfortably passing all conventional tests of reserve adequacy, both the Korean currency and stock market came under severe attack during the third quarter of 2008, triggering widespread fears about a repeat of the 1997–1998 crises. The currency and stock market began to stabilize only after the Bank of Korea entered into a swap agreement with the US Federal Reserve (Park and Estrada, 2009). This paper tries to contribute to the enrichment of the theoretical gap of the determinant factor of portfolio flows. Technically, it tries to asses the effect of swap lines establishment to the portfolio flows during the Subprime Mortgage Crisis.

The research objectives are; first Park and Estrada (2009) concluded that the currency and stock market began to stabilize only after the Bank of Korea entered into a swap agreement with the US Federal Reserve. That is evidence that the establishment of swap line is effective to keep the portfolio flows stable during the crisis. So this paper will investigate whether the presence of swap line affect the portfolio flows during subprime mortgage crisis. Second swap lines which are created during the subprime mortgage crisis among developing countries involves three major partners, they are US Federal

Reserves, Central Bank of China and European Central Bank. Three different partners might arise different consequences to the developing countries. So this paper will also investigate whether major Economic partners of swap line positively affect the portfolio flows during subprime mortgage crisis. And third Aizenman, *et al* (2010) said that the swap line establishment could be an alternative or substitution to the foreign reserves, the quantity of swap arrangement should be sufficient to minimally replace the foreign reserves needed in the critical time. So, this paper will investigate whether the amount currency agreed in swap arrangement affect the portfolio flows during subprime mortgage crisis.

LITERATURE REVIEW

Hernandes, *et al* (2001) studied the determinants of private capital flows to developing countries during the last two episodes of last inflows, in the late 1970, early 1980 and 1990. They also tested for the contagion effects in capital flows among recipient countries, and tries to specific channels through which such effect could occur. It tested for the neighborhood effects, trade related effects, and contagion based on countries having similar macroeconomic indicators . The results shown strong evidence for the first two effects during the 1990s, and indicate that the third effects varies depending on the type of capital flow.

Kim and Wei (2002) investigated the trading behavior of foreign portfolio investors in Korea before and during the currency crisis. The central message is that investors in different categories have different trading patterns. For example, foreign investors outside Korea are more likely to engage in positive feedback trading strategies and are more likely to engage in herding than the branches / subsidiaries of foreign institutions in Korea or foreign individuals living in Korea. This difference in trading behavior is possibly related to the difference in their information. Moreover it may be worth exploring policies that can encourage foreign investors to acquire more information (e.g. by setting up a branch or a subsidiary in the emerging country).

De Vita and Kyaw (2007) investigated the relative significance of the determinants of disaggregated capital flows (foreign direct investment and portfolio flows) to five developing countries, across different time horizons. Using tractable structural VAR model of the determinants of capital flows is developed, and variance decomposition and impulse response analyses are used to investigate the temporal dynamic effects of shocks to push and pull factors on foreign direct investment and portfolio flows. Estimation of the model using quarterly data for the period 1976-2001 provides evidence supporting the hypothesis that shocks to real variables of economic activity such as foreign output and domestic productivity are the most important forces explaining the variations in capital flows to developing countries.

Fretzscher (2011) Employed a factor model coupled with a dataset of high-frequency portfolio capital flows to 50 economies, the paper finds that common shocks – key crisis events as well as changes to global liquidity and risk – have exerted a large effect on capital flows both in the crisis and in the recovery. However, these effects have been highly heterogeneous across countries, with a large part of this heterogeneity being explained by differences in the quality of domestic institutions, country risk and the strength of domestic macroeconomic fundamentals. Comparing and quantifying these effects shows that common factors (“push” factors) were overall the main drivers of capital flows during the crisis, while country-specific determinants (“pull” factors) have been dominant in accounting for the dynamics of global capital flows in 2009 and 2010, in particular for emerging markets.

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Gosh (2012) used two different methodologies to identify surges in Emerging Market Economies over 1980-2009, differentiating between those mainly caused by changes in the country's external liabilities (reflecting the investment decisions of foreigners), and those caused by changes in its assets (reflecting the decisions of residents). Global factors including US interest rates and risk aversion are key to determining whether a surge will occur, but domestic factors such as the country's external financing needs (as implied by an intertemporal optimizing model of the current account) and structural characteristics also matter, which explains why not all EMEs experience surges. Conditional on a surge occurring, moreover, the magnitude of the capital inflow depends largely on domestic factors including the country's external financing needs, and the exchange rate regime. Finally, while similar factors explain asset- and liability-driven surges, the latter are more sensitive to global factors and contagion.

Foster, *et al* (2012) estimated a dynamic hierarchical factor model that is able to decompose inflows in a sample of 47 economies into (i) a global factor common to all types of flows and all recipient countries, (ii) a factor specific to a given type of capital inflows, (iii) a regional factor and (iv) a country-specific component. We find that the latter explains by far the largest fraction of fluctuations in capital inflows followed by regional factors, which are particularly important for emerging markets' FDI and portfolio inflows as well as bank lending to emerging Europe. The global factor, however, explains only a small share of overall variation. The exposure to global drivers of capital flows, i.e. the global factor and the factor specific to each type of capital inflows, is particularly pronounced for countries with a more developed financial system. A fixed exchange rate regime does not shield countries from the ebb and flow of global capital flow cycles.

Recent commentary has downplayed the growth dividend from international financial integration, highlighting the possibly negative correlation between capital inflows and long-run growth. Moody and Murshid (2011) presents new evidence consistent with standard economic theory and a more benign interpretation of cross-border private capital flows. The key observation is that a country's growth volatility changes over time. With volatility below a threshold, an inflow of foreign capital has promoted growth. However, during periods of volatile growth, more flows have been associated with slower growth. Volatility levels and changes reflect an interaction of domestic production and institutional structures with global factors.

Gelos (2008) provided a brief survey of this literature, with a focus on the empirical evidence for emerging markets. Overall, the behavior of international mutual funds is complex and overly simplistic characterizations are misleading. However, there is broad-based evidence for momentum trading among funds. Moreover, funds tend to avoid opaque markets and assets, and this behavior becomes more pronounced during volatile times. Portfolio rebalancing mechanisms are clearly important in explaining contagion patterns, even in the absence of common macroeconomic fundamentals.

Scholars examining the cross-national mobility of capital have followed two distinct paths. Economists tend to focus on the determinants and economic effects of cross-country capital movements while political scientists largely concentrate on the political impact of capital mobility. Alhquist (2006) tried to fill an important gap in the literature by examining the effects of economic policy outcomes on capital inflows to developing countries, explicitly comparing the reactions of portfolio and direct investors.

He found that portfolio investors are in fact sensitive to past government behavior and fiscal policy outcomes; portfolio investors reallocate funds as new information about government policy becomes available. Direct investors, on the other hand, are not sensitive to macro level economic policy outcomes but are concerned with political institutions. Countries with more stable and democratic political institutions attract more FDI. These findings have implications for developing country governments as they consider the sequence of market liberalizing reforms.

Chudik and Fratzsher (2012) analyzed the transmission of liquidity shocks and risk shocks to global financial markets. Using a Global VAR methodology, the findings reveal fundamental differences in the transmission strength and pattern between the 2007-08 financial crises and the 2010-11 sovereign debt crisis. Unlike in the former crisis, emerging market economies have become much more resilient to adverse shocks in 2010-11. Moreover, a flight-to-safety phenomenon across asset classes has become particularly strong during the 2010-11 sovereign debt crisis, with risk shocks driving down bond yields in key advanced economies. The paper relates this evolving transmission pattern to portfolio choice decisions by investors and finds that countries sovereign rating, quality of institutions and their financial exposure are determinants of cross-country differences in the transmission.

Ferreia and Laux (2008) studied the realized openness to portfolio flows of economically more-developed and less-developed countries as it affects future GDP growth. Outflows of a country's funds into U.S. securities are predictive of GDP growth, suggesting that the benefits of openness outweigh local capital flight. Both inflows and outflows of funds via local equity securities are predictive of growth, which is evidence of the benefits of openness. For less-developed countries, the effect of inflows is especially strong. Country-specific volatility in flows does not detract from growth, and volatility in world-wide flows precedes growth. Overall, the evidence is consistent with strong benefits of realized financial integration where the availability of U.S. markets for local portfolio investment along with equity investment from the outside enhances economic growth.

RESEARCH METHOD

Model

The purpose of this research is to address the question whether the swap line establishments in the sense of their presence, the economics' partner and amount of currency agreed significantly affect the portfolio flow stability during the subprime mortgage crisis. To improve the model, some relevant control variables included to the equation. They are: Foreign Exchange Reserves, current account balance, GDP, inflation, trade exposure and financial openness.

So first model can be written as:

$$PORT = \alpha 0 + \alpha 1\ SWAPPRC + \alpha 2\ FXRES + \alpha 3\ CAB + \alpha 4\ GDP + \alpha 5\ INFLAT + \alpha 6\ TRADE + \alpha 7\ FNOPEN + error\ and\ omission \quad \ldots\ldots 1$$

The second model can be written as:

$$PORT = \alpha 0 + \alpha 1\ SWAPPART + \alpha 2\ FXRES + \alpha 3\ CAB + \alpha 4\ GDP + \alpha 5\ INFLAT + \alpha 6\ TRADE + \alpha 7\ FNOPEN + error\ and\ omission \quad \ldots\ldots\ldots 2$$

The third model can be written as:

$$PORT = \alpha 0 + \alpha 1\ SWAPAMNT + X2\ FXRES + \alpha 3\ CAB + \alpha 4\ GDP + \alpha 5\ INFLAT + \alpha 6\ TRADE + X7\ FNOPEN + error\ and\ omission \quad \ldots\ldots 3$$

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Where:
PORT : portfolio flows
SWAPPRC : swap line establishment
SWAPPART : major swap line partner
SWAPAMNT : swap amount
FXRES : foreign exchange reserves
CAB : current account balance
GDP : gross domestic product
INFLAT : inflation
TRADE : trade exposure
FINOPEN : financial openness

Dependent Variable

1.1 Portfolio Flow (PORT)

This variable measures the comparison between portfolios equity flow to GDP in the end of 2009. Portfolio equity includes net flows from equity securities other than those recorded as direct investment and including shares, stocks, depository receipts (American or global), and direct purchases of shares in local stock markets by foreign investors. Data are in decimal, the data came from World Bank.

Independent Variable

1.1 Swap Line Presence (SWAPPRC)

It is dummy that state whether one country establishes the swap line during the peak of crisis in 2008 or not.

1.2 Swap partner (SWAPPART)

It is dummy that state the difference of the swap partner of the developing countries, 1 is for developing countries who establish swap arrangement with china, 2 for the partner of ECB, 3 for partner of US federal reserves and 4 for the partner of more than one country such as Korea that create swap arrangement with both US and China.

1.3 Swap amount (SWAPAMNT)

It is variable of the amount of swap arrangement has been made during the peak of crisis in 2008.

Control Variables

1.4 Foreign Exchange Reserves (FXRES)

This variable measures the amount of stock foreign exchange owned by one country to GDP in the year of 2009.

1.5 Current Account Balance (CAB)

It is the percentage of current balance account to GDP in the year of 2009. The source of the data will be come from World Bank.

1.6 Inflation (INFLAT)

It is the level of inflation in the year of 2009. The source of data will be come from world Bank

1.7 Gross Domestic Product (GDP)

It is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the product

1.8 Trade Exposure (TRADE)

It is the measurement of countries' exposure for its trading, will be calculated by accounting the import to GDP in the year of 2009.

1.9 Financial Openness (FINOPEN)

It is a measurement of the degree of countries' capital account openness in 2009, the source will use the index created by Chinn and Ito (2007).

RESULT AND DISCUSSION

The sample of this research is the developing, the advanced economic countries are excluded from the sample as well as the least developed countries. From the data availability of all variables resulted in 64 countries. The observation period is the year of 2009, in the beginning of this year a portion of swap establishment occurred, when the other portion has been agreed in the end of 2008. This year is ideal period to see the restoration of the economic including the portfolio flows after destructed subprime crisis period.

Goodness and Fit Model

- Normality test, from the Jarque Bera normality test, revealed that all of the model are not skewed, the skewness of all model are closed to zero.
- Multicollinearity test, to review this measurement the variance inflation factor is assessed. From the value of centered VIF, all of them are less than 10, indeed no one of the variables in three models has a score of VIF more than 3. It is implied that there is no evidence of multicollinearity for all of the models.
- Autocorrelation test, from the Durbin Watson significance table can be seen that the value of dl and du for approximately 65 data and 7 explanatory variables are 1.370 and 1.843. Durbin Watson statistics are 2.11, 2.10 and 2.07 for model 1, model 2 and model 3 respectively, that value lies between du and 4du, meaning that there is no autocorrelation on those models.
- Heteroscedasticity test, the White test is run to asses the presence of the heteroscedasticity, for all of the models the p values are less than 0.05, proving that there is no evidence of heteroscedasticity in all of models.

Hypothesis Test

The result of the hypothesis test revealed that generally independent variables have a sizeable effect to the dependent variable. The F test for all of the models is highly statistically significant; it proves that all of the models have been fit to the data. All of the t test are significant but in the different level. The coefficient of determination varied between 38.1 % to 49.2 % across the models, adjusted R square is used to assess this measurement. The summary of the hypothesis test exhibit in the Table 1.

This table shows the cross country regression through ordinary least square, the dependent variable is the portfolio flows/GDP, the independent variables are the presence of swap line, the swap partner and the amount of swap. The other variables are the control variables, comprise foreign reserves/GDP, current account balance/GDP, LnGDP, inflation, level of financial openness and trade exposure. Absolute values of t-statistics are in parentheses, *, **, and *** indicate significance at 10%, 5%, and 1% levels respectively.

The swap establishment has no a positive effect on the flows of portfolio to the developing and emerging countries. The t-test result is not significant; it indicates that there isn't relationship between swap establishments to the portfolio flows. The coefficient determination is 38.1 %, it is a relatively accepted value. However, this initial result suggests that this model, the presence of swap establishment is too general, so the result is not convincing. It might be better to investigate this issue much detail.

The second model analysis provides better statistical result. Major swap partner has a positive effect on the portfolio flows. Different from the first model, the t-test result for this hypothesis is much better, significant at the level of 10 %.As well as the t-test, the coefficient of determination also reveal better value for this model. It seems that further explanation of the major swap partner, not just the swap establishment provides better explanatory power to the model.

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Table 1. Regression Result

	Model 1	Model 2	Model 3
C	-0.0596 ***	-0.0555 ***	-0.0422 **
	(-3.3398)	(-3.1693)	(-2.6138)
FOR_GDP	0.0173 ***	0.0176 ***	0.0168 ***
	(3.4802)	(3.5825)	(3.7324)
CAB_GDP	-0.0443 ***	-0.0330 ***	-0.0341 ***
	(-2.5524)	(-2.6908)	(-3.0174)
LNGDP	0.0023 ***	0.0021 ***	0.0016 **
	(3.2875)	(3.0985)	(2.5493)
INFLATION	0.0000	0.0000	0.0000
	(-0.0362)	(-0.3625)	(-0.1643)
FNOPEN	0.0000	-0.0002	-0.0003
	(0.0583)	(0.3685)	(0.5192)
TRADE	0.0000	0.0000	0.0000
	(0.8975)	(0.0301)	(-0.5806)
SWAPPRC	0.0036		
	(1.2897)		
SWAPPART		0.0021 *	
		(1.8567)	
SWAPAMNT			0.0004 ***
			(3.7751)
Adjusted R Squared	0.3810	0.3996	0.4919
F Stat	6.5410	6.9909	9.7153
Prob (F Stat)	0.0000	0.0000	0.0000
N	64	64	64

Table 2. Amount of Swap in US Dollar

No.	Date swap	Country	Amount	Amount in US dollar
1	30 October 2008	Brazil	30 billion dollar	30 billion dollar
2	30 October 2008	Mexico	30 billion dollar	30 billion dollar
3	30 October 2008	Singapore	30 billion dollar	30 billion dollar
4	30 October 2008	South Korea	30 billion dollar	30 billion dollar
	12 December 2008	South Korea	180 billion yuan	26.29 billion dollar
5	20 January 2009	Hongkong	200 billion yuan	29.24 billion dollar
6	8 February 2009	Malaysia	80 billion yuan	11.70 billion dollar
7	11 march 2009	Belarus	20 billion Yuan	2.92 billion dollar
8	24 March 2009	Indonesia	100 billion yuan	14.64 billion dollar
9	30 March 2009	Argentina	80 billion yuan	11.70 billion dollar
10	16 October 2008	Hungary	5 billion Euro	6.75 billion dollar
11	6 November 2008	Poland	10 billion Euro	12.77 billion dollar
12	8 February 2009	Malaysia	80 billion yuan	11.70 billion dollar

Sourced: processed secondary data

Third model explain the effect of amount of swap arrangement to the flows of portfolio. Because the currency used in the swap arrangement is diverged, so amount the other currency swap is converted to the dollar as the prevailed exchange rate at the swap arrangement agreed as exhibited in the table 2 above. From the regression result this model provides t-test value at the level of 1 %, and coefficient of determination value 49.19%, obviously the H3 is accepted. This model is the best model, has the biggest explanatory power than the other.

The result above give bigger illustration on how the swap line establishment could be able to restore the portfolio flows to the developing and emerging countries post the peak of crisis. Irrespective to the limitation of the swap arrangement as mentioned by Aizenman et al (2010) that there is only a limited scope for swaps to substitute for reserves, this evidence proves that the establishment of the swap line itself support the portfolio flows recovery after the occurrence of the sudden stop. At least, the swap line establishment relief the countries from the more destructive financial crisis as happened before.

Another important feature from this financial crisis series is the engagement of numerous major economic powers, US, China and European Central bank to create an arrangement with some developing and emerging countries. From the statistical analysis result, swap partner significantly affect the portfolio flows even though not too strong. However the certain reason for this is not clear enough, whether it is caused by the currency that is used in that swap arrangement, the evidence shows that US as the partner provide better portfolio flows (although the combination of US and China as the South Korean case is much better) it might be reflect the dollar favoritism as save haven currency in the crisis period. From the other perspective, the influence of US in the world investment including the portfolio is very significant, as the US position as the world financial centre, this possibility could be the reason behind this phenomena.

Finally, the significance of the amount of swap reveals that in the case of swap arrangement, the quantity of the arrangement also important. Once again this evidence shows that the role of swap arrangement is relatively similar to the international reserves accumulation. Higher number of swap amount will sign that those countries have sufficient reserves and ready for the worse effect of the sudden stop. This also inform the possibility of creation of more than one swap arrangement such as the South Korean case will be beneficial, one of the reason is because it will generate higher amount of swap from both arrangement.

CONCLUTION

This paper tries to investigate the effect of swap line to the portfolio flows to developing market in the subprime mortgage crisis. This issue is interesting to be studied because the swap line establishment is relatively new phenomenon in the international financial resolution. In order to elaborate this issue comprehensively, the swap line establishment breaks down to the swap line presence, major economic partner of swap line and the amount of swap line. This research sample of 64 developing and emerging market and the observation period year is 2009.

From the analysis result reveals that the swap presence has no effect to the portfolio flows to the developing and emerging market. The swap partner variable statistical result is more convincing; but the relationship is not too strong, at the level of 10% significance.. And finally the swap amount variable provide much better result, it is highly significant at the level of 1 %.

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This result indicates that the role of the swap line establishment is relatively similar with the international reserves. The amount of swap arrangement should be high enough to guarantee that those countries economic condition is well so the portfolio investment will return to those countries. Another important finding is that the partner of swap line for developing countries is also crucial, but the reason why this matter is happened is not clear yet. Finally this result strengthen Aizenman (2010) hypothesis that the swap line establishment is beneficial to overcome the problem of losing international reserves for developing and emerging countries in the peak of the crisis.

For the future research, first it is interesting to see whether the swap line will be conducted more frequent in the crisis situation, And second whether this activities will reduce the intention of developing and emerging countries to hoard the international reserves.

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Appendix

Sample Countries

Albania	Hongkong	Peru
Argentina	Hungary	Philippines
Armenia	India	Poland
Barbados	Indonesia	Portugal
Belarus	Israel	Rumania
Botswana	Jordan	Russia
Brazil	Kazakhstan	Senegal
Bulgaria	Korea	Singapore
Cameroon	Kuwait	Slovak
Cape Verde	Kirgiz	Slovenia
Colombia	Latvia	Sri lanka
Cote D'ivore	Lebanon	Swaziland
China	Lithuania	Tanzania
Croatia	Macedonia	Thailand
Cyprus	Malaysia	Tunisia
Czeck	Mexico	Turkey
Equador	Moldova	Ukraine
Egypt	Mongolia	Uruguay
Estonia	Morocco	Venezuela
Fiji	Nigeria	Vietnam
Georgia	Oman	
Greece	Pakistan	