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Monetary Tsunami revisited

국제적 화폐공급과잉에 대한 고찰

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서 찬 주

Master's Thesis

Monetary Tsunami revisited

A Thesis Presented

By

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이 논문을 국제학석사학위논문으로 제출함

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Abstract

Ever since the terminology ‘monetary tsunami’ was first introduced by the presdient Dilma Rousseff in 2012, there have been many studies on the spillover impacts of quantitative easing on emerging economies. However despite the fact that multiple unconventional monetary policies were put into action at the same time, all the papers conducted research focusing on independent country/economy such as US, Japan, ECB. Noting the possibility to revisit impacts of quantitative easing on emerging economies, this paper examines spillover impacts of quantitative easing by looking at gross financial inflows to 20 Latin American countries and 22 Asian countries from 2007 to 2014 with a particular focus on the periods where United States and Japanese quantitative easing schedule overlaps using LSDV estimation method. This paper finds evidence for positive role of unconventional monetary policy to gross financial flow to Asia at a bout 18.7% for the period where US Japan QE overlaps and little to no impacts to Latin American countries. This paper paves the way for further consideration for other periods where quantitative easing operations further overlap such as those of ECB.

Keyword: Monetary Tsunami, Quantitative Easing, Spillover effects, Asia, Latin America, LSDV, US, Japan, international

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1. Introduction

1.1 Purpose of study

Although there exist many studies regarding spillover impacts of monetary policies, unconventional monetary policies such as quantitative easing and forward guidance are relative new term that appeared after 2007. There are many variations within previous studies as to where the focus of spillover be placed such as net inflows, exchange rate, 10-year nominal bonds, money base, and foreign investments. Furthermore, there was no paper that conducted researches to find the joint spillover impacts of American quantitiave easing and Japanese quantitative easing despite the fact that these two separate events share overlapping periods. When considered together, there might be a chance that previous studies of spillover impacts by Japanese quantitive easing effect and American quantitive easing effect are over or underestimated. Furthermore, other studies have pointed out the possibility that quantitaive easings impact vary depending on the country. Although quantitative easing may have impact globally, previous papers' focus on the spillover impacts on advanced economies such as EU, Japan, UK are less important to emerging economies because original sin countries who face currency mismatch problems can encounter rather different and magnified spillover impact from quantitative easing than advanced economies.

That is why I became curious to find out whether previous studies would have

the same implication to East Asian emerging countries when American QE and Japanese QE are considered together.

1.2 Research Question

When American and Japanese quantitative easing are considered together would Asia be affected differently from other region?

1.3 Backgrounds

The terminology ‘monetary tsunami’ was first introduced by the presdient Dilma Rousseff in 2012. Due to concerns over potential depreciation in value of developed countries caused by quantitiave easing operations, president Dilma blasted Western countries’ QE as monetary tsunami that could impair growth in other nations including Brazil. (Blackden 2012) As depicted in New York Times, US QE for example starts off from Federal Reserve creating money and creditting to its own account. The Fed then can use the money to buy US treasury bonds from dealers such as citigroup or JPMorgan. As money is injected during this process, interest rate which reflect the cost of money decreases as the supply of money increases. In theory, lower cost then stimulates consumers to spend more as it becomes less optimal to save money. (NY Times 2011)

The time periods for quantitative easing schedule vary slightly from scholar to scholar. However, because this paper’s aim is to revisit previous studies result, US

quantitative easing periods will be same as those by Lim, Mohapatra and Stocker (2014). Consequently, for US QE, period that starts from 2009 Q1 to 2010 Q3 is denoted as QE 1, from 2010 Q2 to 2011Q2 as QE 2 and 2012 Q4 to 2013 Q2 as QE 3 (Lim Mohapatra and Stocker 2014). For Japan, 2010 Q4 is denoted as QE1, periods from 2011Q3 to Q4 is denoted as QE 2, 2013 Q2 as QE3, 2014 Q4 as QE 4.[1]

[1] Normally only US QE is separated as QE 1, 2, 3. However for ease of calculation, each major Japan related QE announcements are numbered in similar manner by considering major Japanese QE announcements from the news.

2. Literature Review

2.1 Estimation methodology comparison

Marcel Fratzcher, Marco Lo Duca and Roland Straub analyzed the impact of global spillover impacts of the U.S. Federal Reserve's quantitative easing since 2007 using two separate periods for QE on 65 emerging and advanced economies. They found that Fed QE operations eventually led to capital inflows toward emerging economies and an outflow for the US, triggering a portfolio rebalancing across countries out of emerging markets into US equity and bond funds under QE1, and in the opposite direction under QE2(Fratzcher, Lo Duca and Straub 2012)". In order to evaluate the impact of QE via portfolio decisions, asset prices and exchange rates, Fratzcher Lo Duca and Straub used following model:

$$y_{i,t} = E_{i,t\text{-}1}[y_{i,t}] + (\beta + \gamma^{EME} D_i^{EME} + \gamma^{AE} D_i^{AE}) MP_t + \varepsilon_{i,t}$$

where MP = [AN_1, AN_2, LQ, TR, MBS]

"$Y_{i,t}$ stands for the net inflows into bonds or into equities, expressed in percentage of all assets under management, equity price returns, the first difference of long term bond yields or the exchange rate return in country *i* and day *t*. D_i^{EME} is a dummy variable for an emerging economy, and D_i^{AE} is a dummy variable for advanced economies. Hence, the impact of a particular policy measure MP_t on the US is portrayed by the coefficient β, while the additional impact on EMEs and AEs is denoted by the respective coefficients γ. AN_1 and AN_2 are dummy variables with a

value of 1 for announcements related to QE1 and QE2 respectively. LQ stands for liquidity support in the financial sector, TR stands for purchases of long-term Treasury Bonds and MBS stands for purchases of long term mortgage backed securities of which all three values can take positive or negative values. $E_{i,t-1}$ stands for set of control variables including changes in portfolio allocations and asset prices for country *i* and time *t"* (Fratzcher, Lo Duca and Straub 2012). What the authors found out are two things: firstly, QE1 policies during the first phase in 2008-2009 triggered a "substantial rebalancing in global portfolios, with investors shifting out of EMEs and other AEs and into US equity and bond funds (…) By contrast, Fed policies during the QE2 in 2010 induced a portfolio rebalancing in the opposite direction, pushing capital into emerging economies" (Fratzcher, Lo Duca and Straub 2012). Secondly, they also found that Fed operations, such as the purchases of Treasuries and MBS exerted larger effects on portfolio decisions and asset prices than Fed announcements. Finally, they found that Fed policies exerted larger effects on asset prices than on capital flows (Fratzcher, Lo Duca and Straub 2012). The limitation of this paper is that it did not take into account of overlapping period of Japanese QE under Abenomics whose operation period overlapped with US QE1 and QE2. Consequently, some of the effects explained by the authors can possibly be accrued to Japanese QE. Torben W. Hendricks and Bernd Kempa who found out heterogeneity of the monetary transmission mechanism in the Euro area (Hendricks and Kempa 2008), provide us a room to doubt that QE spillover impact can be heterogeneous even among emerging and advanced economies. Because Japan for example pursued unconventional

monetary policy through treasury bond purchases only excluding MBS purchases, findings by Fratzcher Lo Duca and Straub (2012) could be misleading especially for East Asian countries that might be affected more from Japanese quantitative easing operation.

Event study methodology conducted by Christopher J. Neely to find effects of US QE used the results for two event sets: the eight buy/sell events and all FOMC events from November 2008 through 2009 considering 1-day announcement windows and confirming the robustness of the inference to intraday and 2-day windows (Neely 2015). Neely's finding was that unconventional policy can reduce international long-term yields and the value of the dollar even at the zero bound. "Long-term asset purchases and forward guidance reduced expected long-term U.S. real and nominal bond yields, long-term foreign bond yields, and the value of the dollar especially the international 10-year yields of Australia, Canada, Germany, Japan, and UK declined substantially (Neely 2015)." Because the spillover effects of US QE were limited to only 5 advanced economies, generalization of spillover effects of US QE to the emerging economies can be misleading. Even though event study method is adopted frequently by other scholars, daily buy and sell data are in most cases limited to subscription based premium accounts that are not accessible to the public. This could be a hindrance for adopting this method. Finally, Neely's estimation model did not consider into account for Japanese QE influence.

Menzie D. Chinn analyzed the unconventional monetary policy measures in the context of conventional models of asset prices, with particular reference to

exchange rates. Chinn tested this by using vector auto regression approach, for the periods from 2008 to 2013. What Chinn found out is that "an increase in the money base/GDP ratio weakens the dollar at horizons of two to three months to major advanced economies and Brazil, Russia, India and China (Chinn 2013)". The takeaway from Chinn's paper is that it utilized VAR approach focusing on exchange rate. However, because not only the effects of QE are limited to 4 countries, the results were not robust and significance levels were not optimal.

Moore, Nam, Suh, and Tepper conducted panel analysis using

$$Y_{i,t} = \alpha + \beta_1 UI_{i,t} + \beta_2 EI_{i,t} + \beta_3 EC_{i,t} + \beta_4 ARB_{i,t} + \beta_5 VIX_{i,t} + \beta_6 CDS_{i,t} + \beta_7 VOL_{i,t} + \beta_8 GDP_{i,t} + \beta_9 D1_{i,t} + \beta_{10} D2_{i,t} + \tau_i + \varepsilon_{i,t}$$

on 10 emerging economies (Brazil, Hungary, Indonesia, Korea, Malaysia, Mexico, Peru, Poland, Thailand and Turkey) to measure the impact of US long term asset purchasing on capital flows into emerging economies bond markets and on their long-term interest rates where, $Y_{i,t}$ stands for foreign shares in government bond markets, UI_t stands for US 10-year Treasury yield, EI_t stands for emerging economies' government bond yields, EC_t stands for currency appreciation, ARB_t stands for arbitrage opportunities, VIX_t stands for US VIX indexes, CDS_t : CDS premiums, VOL_t : first difference of government bond markets' volumes, GDP_t : GDP growth rates, $D1_t$: dummies for Citigroup's World Government bond index, $D2_t$: dummies for Citigroup's additional market index (Moore et al. 2013). What they found was that

U.S. long term asset purchases increased portfolio flows into many emerging market economies. "A 10-basis point decrease in the U.S. 10-year Treasury yield pushes up the foreign share in government bond markets of the EM countries in their sample by an average of 0.4 percentage points, which in turn causes their government bond yields to fall by roughly 1.7 basis points (Moore et al. 2013)". The takeaway from this paper is that apart from the panel analysis, this paper conducted a separate analysis only on Korea in order to compare Korea's result with other emerging economies. Furthermore, in order to test the robustness of the result, this paper conducted two other existing methods of analyzing impacts of unconventional monetary policy: Vector Auto Regression approach, Event study approach.

Lim, Mohapatra and Stocker analyzed the effect of quantitative easing on financial flows to developing countries from 2000 to 2013 by analyzing the gross financial inflows. When conducting the analysis using liquidity, portfolio rebalancing, and confidence channels, "the effects average from 0.08 to 0.09 percent (half a standard deviation) for a one standard deviation change in QE related variables, for the average country, per quarter (Lim, Mohapatra and Stocker 2014). Lim, Mohapatra and Stocker found that heterogeneous effects among financial flow measures: FDI was mostly insensitive to QE related channels whereas portfolio rebalancing channel appeared to drive the most of the result (Lim, Mohapatra and Stocker 2014). The takeaway from this paper is that, different from other papers which adopted EPFR Global data to acquire the flow of the investment related data to a country, through separation of channels namely foreign direct investment, portfolio and bank lending,

ease of getting the access to the data can be achieved. Furthermore, variables such as yield curve which show sensitivity to invest either short term basis or long term are unique that are not found in any other paper. However, this paper also neglects the possibility of overlapping effects caused by Japanese QE on other emerging or developing countries.

2.2 QE spillover effects on neighbouring countries

Policymakers in emerging Asia had expressed concerns that the bank of Japan's QE policies may cause negative spillover impacts on emerging Asia through yen depreciation (Kawai 2015). McKinnon and Liu on the other hand provide econometric evidence which shows that Japan's economic growth has a positive impact on growth in many emerging Asian economies, while yen depreciation negatively affects their growth (McKinnon and Liu 2013). Even though it is true that the Bank of Japan QE has resulted in yen depreciation, "there is not much evidence whether Bank of Japan's QE has exerted beggar-thy-neighbor impacts on emerging Asian economies. In addition, Japan's fiscal stimulus (the second arrow of Abenomics) offsets monetary policy's potential negative impact on other economies, especially those in Asia." (Kawai 2015)

The lessons learned from McKinnon, Liu and Kawai is that Bank of Japan's QE has positive impact on neighboring Asian countries. Even if Bank of Japan's QE exert negative spillover impact such negative impact is offset by Japanese fiscal stimulus. The biggest takeaway from these papers are that neighboring Asian countries

are affected more from Japanese policy than United States. Similar to papers discussed above, McKinnon, Liu and Kawai, only focused their estimation using Japanese model. Adoption of model that incorporates overlapping period by the US and Japan may either lead to different results or strengthen their claims.

According to Bank of Canada Review, the spillover effects of QE on emerging economies deliver mixed results. Quantitative Easing from advanced economies cause upward pressure in asset prices and exchange rates further causing increase in financial flows to EMEs. Although it may depend on each of the emerging economies' financial fundamental level, the overall impacts of QE are positive since QE lead to increase in trade volume boosting confidence level among countries that adopt QE (Lavigne, Sarker and Vasishtha 2014). The authors state that the only time when the effect of QE can be negative is when advanced economies that adopted QE starts to normalize their monetary policies such as tapering which will revert capital flows that previously were directed to emerging economies back to advanced economies as people starts to rebalance their portfolio following higher yields in advanced economies under market imperfection (Lavigne, Sarker and Vasishtha 2014).

2.3 Sensitivity to Economic Stress

According to Barry Eichengreen, currency war is the beggar-thy-neighbor policies undertaken by central banks of depressed economies (Eichengreen 2013). In 1930s, when the U.S., the Eurozone, the United Kingdom and Japan experienced deflationary pressures, quantitative easing which brings currency depreciation was an appropriate

symmetrical response for all of them and it was solution for the rest of the world as they all reacted uniformly. “However, in recent episodes a second group of economies that were not affected symmetrically worried about inflation rather than deflation and about currencies, asset prices and even growth rates that were too strong rather than too weak (Eichengreen 2013)”.

In short, Eichengreen pointed out that the economic stress such as deflationary pressure is felt different from country to country. Whereas countries like U.S., EU, Japan, UK felt it strongly, other countries had not felt same pressure which creates heavily asymmetric patterns of shocks among countries. Consequently, this finding paves the way for potential different outcome when QE operation is accounted for both US and Japan.

3. Methodology

3.1 Estimation methodology

The main method of estimation would be same as that of Lim, Mohapatra and Stocker's model:

$$GFI_{i,t} = GFI_{i,t-1} + \lambda L_{i,t} + \pi PB_{i,t} + \chi C_{i,t} + \theta QE_{i,t} + \beta' X_{i,t} + CRISIS_t + POSTCRISIS_t + \alpha_i + \tau_t + \varepsilon_{i,t} \quad (1)$$

where GFI stands for gross financial inflow measured by sum of changes in foreign direct investment, portfolio investment, bank lending data and net of disinvestment in FDI, portfolio investment and bank lending in country *i* at time *t*. GFI can be transmitted via traditional channels defined by liquidity channel, portfolio balance channel and confidence channel. $L_{i,t}$ which stands for liquidity channel is composed of two major indicators. The first is 3-month treasury bill rate which show the direct effect of short-term changes post QE operation. The second is the lagged money supply (M2) which may reveal indirect effect that is not captured by 3month treasury bill. $PB_{i,t}$ which stands for portfolio balancing is measured by yield curve, growth differential to QE country and interest rate differential to QE country. As to why one might invest abroad is depended upon how much can one expect from his or her own country when investing comparing long-term to short term and how much different interest rates are among countries and expected growth. Yield curve is calculated by finding the difference between the 10-year government bond yield and 3-month

treasury bill rate. Interest rate differential is calculated by finding the real interest rate difference between QE enacting country and other countries. Growth rate differential is calculated by finding the lagged difference between the real growth rate between QE enacting country and other countries. These three indicators capture how changes in QE which affect long term yield induce people to invest in riskier assets from developing countries by looking for arbitrage possibilities. $C_{i,t}$ stand for confidence channel of how GFI is affected. This variable is measured by looking at VIX index. VIX is a key measure of implied market volatility as it shows market expectations of near-term volatility conveyed by S&P 500 stock index option prices. (CBOE 2017) $QE_{i,t}$ variable is a time dummy variable which takes value if it corresponds to the quantitative easing schedule of U.S, Japan or overlapping periods. $X_{i,t}$ variable is matrix of control variable that might have impact on gross financial inflow such as national credit to GDP, world saving, nominal US GDP, terms of trade. $CRISIS_t$ and $POSTCRISIS_t$ are dummy variable that take value one if the time correspond to the actual financial crisis or post financial crisis. Crisis period is selected from 2008Q3 to 2009Q2 and 2009Q3 and 2013Q2 are selected as post crisis periods. α_i is country specific data and τ_t is country specific effect that may exist. Finally, $\varepsilon_{i,t}$ stand for error term (Lim, Mohapatra and Stocker 2014).

3.2 Data sources and key variable definitions

Variable	Definition	Source (method; specific source)
FDI	Net inflow of foreign direct investment	DataStream; IMF
Portfolio investment	Net inflow of portfolio investment	DataStream; IMF IIP
Bank lending	Net inflow of bank lending	BIS; LBS
3M	3-Mmonth treasury bill rate	DataStream
M2	Lagged money supply	FRED
Yield Curve	Difference between 10-year and 3-month bill rate	DataStream
Interest rate differential	Real interest rate differential to QE enacting country	DataStream; WDI
Growth rate differential	real growth rate differential to QE enacting country	DataStream; WDI
VIX	VIX bid rate	DataStream
GDP	Nominal GDP	World bank; WDI
Saving	World aggregate saving	World bank; WDI
Trade(%GDP)	Sum of export and import of goods and services as a share of GDP	World bank; WDI
Credit (%GDP)	Financial resources provided to the private sector by financial corporations as a share of GDP	World bank; WDI

For portfolio investment and bank lending variables where net inflow data are not accessible, to take into account net disinvestment, the variables are computed by subtracting assets or claims data from liabilities data. This is important because, liabilities data which mean inflow of foreign capital (liable to overseas) does not capture increase in financial capacity from not spending (asset or claim on overseas). This is why FDI, portfolio and bank lending data are considered twice as in increase in inflow and decrease in outflow. Furthermore, to see the effects of how QE operation affected gross financial inflow, flow data is necessary rather than stock data. Consequently, by computing the changes from year to year, flow data can be calculated. For transformation purposes, all the data that are not either in indices or percentage form were set in millions of dollars before applied with logarithm.

The data periodicity of this paper was set from 2007 Q4 to 2014 Q4 as quarterly data and was estimated and transformed from yearly data to quarterly data using cubic spline interpolation for periods where only annual data were present instead of quarterly data. The estimation would be conducted using Least Square Dummy Variable (LSDV) estimator taking into account for random effects (Bun and Carree 2005). Furthermore, after running data some of the variables that are listed above are dropped to present the better result projection. In order to test whether the effects of QE differ from region to region as mentioned by some scholars in the literature review, comparing about equal size of regions was essential. Consequently, this paper used a panel of 20 Latin American countries and 22 East Asian countries

excluding Japan. For cases where joint effect of Japanese and US QE were tested, variables such as 3-month treasury bill rate, lagged M2, yield curve, lagged growth differential, real interest rate differential, nominal GDP are computed as point average of US and Japan data.

In an attempt for robustness check on the main estimation model by Lim, Mohapatra and Stocker, rather than applying different methodology such as VAR approach or gathering data from different source such as EPFR as conducted by other scholars, this paper expanded the scope of countries from 42 countries to 144 countries using World Economic Situation and Prospects definition excluding least developed countries due to lack of data (UN 2014). This extension which can be found in appendix I, was applied only to the US QE model only to verify whether application of this methodology to show US-Japan QE is in line with the other scholars' finding.

3.4 Hypothesis

Judging from McKinnon, Liu and Kawai papers, I hypothesize that East Asian countries will be affected positively with greater magnitude from the Japanese QE than American QE compared to Latin America. Conversely, based on paper by Lavigne, Sarker and Vasishtha (2014) Latin American countries would be affected positively with greater magnitude from American QE than Japanese QE compared to East Asia. Furthermore, I hypothesize that for the periods where both US and Japanese QE overlap, effects of QE will be smaller than independent QE effect both for Asia and

Latin America. Finally, due to expectations the severity of spillover impact will diminish as QE operation progresses both for American, Japanese QE.

4. Results and Analysis

4.1 US QE overall effect

As we can observe from table 1, when we conduct the estimation on how US QE affect Asia and Latin America using the estimation methodology by Lim, Mohapatra and Stocker, the main variable of our interest, US QE show negative impact with no statistical significance. Furthermore, variables such as 3-month treasury bill rates, yield curve showed no statistical significance despite logical sense from its definitions.

Different results to Lim, Mohapatra and Stocker's paper could be possibly due to the omission of JP Morgan's global composite purchasing managers' index which measures sensitivity to short term or long-term growth expectations, institutional investor risk rating variable which show countries' desirability as investment destination that are present in Lim, Mohapatra and Stocker's paper but not in this paper. In addition, shortened sample time period as well as limited number of countries with missing variables add up to the reason for the difference. However, US QE variable showing close to 76% of rejecting require further investigation by differentiating US QE variable into three separate events: QE 1, QE 2 and QE 3.

Table 1: Overall impacts of US QE on Asia and Latin America [2]

Random Effects GLS estimation		
Number of observation	237	
R-sq overall	0.87	
Variable	**Coefficient**	**Significance Level**
GFI_t1	0.505	***
	[0.000]	
Lagged M2 US	-90.998	**
	[0.078]	
3 Month T-bill	-22.861	
	[0.258]	
Yield curve	0.139	
	[0.791]	
Lagged growth differential	-0.122	*
	[0.012]	
Interest Rate Differential	-0.041	***
	[0.033]	
VIX	0.268	**
	[0.080]	
US Nominal GDP	41.346	
	[0.285]	
World Aggregate Saving	44.630	***
	[0.002]	
US QE	-0.121	
	[0.760]	
_Cons	(omitted)	

***p<0.05, **p<0.10, *p<0.15

When US QE variable is separated into three separate events namely QE 1, 2, and 3, we can obtain results as in the table 2.

[2] Within LSDV method, taking for random effects into account formula is used for all the tables hereafter including table 1 as opposed to fixed effect since taking into account for fixed effect formula omits our main variable of interest: QE indicator variables.

Table 2: Overall impacts of US independent QEs on Asia and Latin America[3]

Random Effects GLS estimation		
Number of observation	237	
R-sq overall	0.871	
Variable	**Coefficient**	**Significance Level**
GFI_t1	0.499	***
	[0.000]	
Lagged M2 US	-90.067	**
	[0.080]	
3 Month T-bill	-22.551	
	[0.263]	
Yield curve	0.131	
	[0.803]	
Lagged growth differential	-0.119	
	[0.013]	
Interest rate differential	-0.040	***
	[0.039]	
VIX	0.267	***
	[0.080]	
US Nominal GDP	40.692	
	[0.292]	
World Aggregate Saving	44.391	***
	[0.002]	
QE		
1	-1.323	***
	[0.040]	
2	-0.638	*
	[0.107]	
3	-0.153	
	[0.698]	
_cons	(omitted)	

***p<0.05, **p<0.10, *p<0.15

Overall US QE effects on gross financial inflow can be interpreted as following: First,

[3] Note that similar to the table 1, crisis, post crisis dummy variables are omitted systematically from STATA. Furthermore, time specific variable and country specific variables are taken into consideration but not displayed in all of the tables

1% increase in gross financial inflow of the previous year can lead to 0.499% increase in the gross financial inflow in current year at 5% significance level. Furthermore, the elasticity of GFI with lagged M2 level of US is negatively correlated at 90.06% at 10% significance level. The elasticity of GFI with 3-month treasury US bill is negatively correlated at 22% with no statistical significance. As the difference between the long-term yield and short-term yield in the US gets bigger by 1%, it affects GFI about 13% positively with no statistical significance. As lagged growth differential widens by 1%, GFI flow decrease by 11% with no statistical significance. As interest rate differential widens by 1%, GFI flow decreases by 4%. 1 unit change in VIX led to 30% increase in GFI. Finally, our main variable of interest which is US QE affects negatively to GFI flow to Asia and Latin America at decreasing magnitude and statistical significance.

The fact that some of the variables such as 3-month US treasury bill rates, yield curve and lagged growth differential to the US revealing no statistical significance can be explained partly due to limited sample size which lack data for some of the variables in the extreme cases and limited sample periods that focused only post 2007 in addition to missing key variables such as PMI composite index and country rating that might have impact on overall results.[4]

The negative effect of QE variable which should have positive value on other

[4] Other control variables such as credit to GDP, debt to GDP, terms of trade and world aggregate saving that are not displayed in the chart from hereafter are dropped from calculation due to lack of statistical significance.

countries, pave the way for further differentiation of the estimation by controlling for Asia and Latin America separately.

Table 3: Overall impacts of US QE extended version

Random-effects GLS regression		
number of observations	2137	
R-sq	0.08	
Variable	Coefficient	Significance Level
GFI_t1	-0.01	
	[0.617]	
M2USlag	8.95	***
	[0.048]	
3 Month T-bill	1.68	***
	[0.041]	
Interest rate differential	0.00	
	[0.848]	
Yield Curve	0.62	***
	[0.048]	
Lagged growth differential	0.00	
	[0.375]	
VIX	-0.04	
	[0.170]	
QE		
1	2.15	***
	[0.033]	
2	1.24	***
	[0.052]	
3	0.19	***
	[0.099]	
GDP nominal	-8.82	***
	[0.048]	
Saving	(omitted)	
Credit to GDP	0.00	*
	[0.137]	
Trade to GDP	0.00	
	[0.306]	

***p<0.05, **p<0.10, *p<0.15

Before doing so, when we compare the above results with extended version of

the test with 144 countries listed in appendix 1, we can observe the following results as shown in table 3.

From the variables that showed significance level up to 15%, lagged M2 level, 3-month treasury bill rates and yield curve affected GFI positively. The spillover effects of U.S. Quantitative Easing on gross financial inflow to the rest of world excluding the least developed countries were positive throughout the whole three operations at a decreasing magnitude. Comparing on the list of variables that are significant, we can confirm that our estimation model which used 44 countries is relatively acceptable method.

When we conduct the table 3 results only using Asian countries, we can observe quite different results as displayed in table 4. Overall US QE effects on gross financial inflow to East Asia can be interpreted as following: First, 1% increase in gross financial inflow of the previous year can lead to 0.39% increase in the gross financial inflow in current year at 5% significance level. Furthermore, the elasticity of GFI with lagged M2 level of US is negatively correlated at 143.86% at 5% significance level. The elasticity of GFI with 3-month treasury US bill is negatively correlated at 36.68% with no statistical significance.

Table 4: US QE effects on Asia

Random Effects GLS estimation		
Number of observation	125	
R-sq overall	0.932	
Variable	**Coefficient**	**Significance Level**
GFI_t1	0.390	***
	[0.000]	
Lagged M2 US	-143.863	***
	[0.049]	
3 Month T-bill	-36.686	
	[0.185]	
Yield curve	0.474	
	[0.528]	
Lagged growth differential	-0.059	
	[0.310]	
Interest rate differential	-0.044	*
	[0.147]	
VIX	0.303	*
	[0.112]	
US Nominal GDP	91.832	***
	[0.092]	
World Aggregate Saving	46.922	***
	[0.022]	
US QE		
1	182.721	*
	[0.134]	
2	-0.630	
	[0.449]	
3	-2.060	**
	[0.066]	
_cons	(omitted)	

***p<0.05, **p<0.10, *p<0.15

As the difference between the long-term yield and short-term yield in the US gets bigger by 1%, it affects GFI about 47.4% positively with no statistical significance. As lagged growth differential widens by 1%, GFI flow decrease by 5.9%

with no statistical significance. As interest rate differential widens by 1%, GFI flow decreases by 4.4%. 1-unit change in VIX led to 30.3% increase in GFI. Finally, our main variable of interest which is US QE affects positively to GFI flow to Asia for QE period 1 at 15% significance level. For both QE 2 and 3, QE affects negatively to GFI flow at 10% significance level for QE 3.

When the estimation is focused only in East Asia, the results show that initially QE operation lead to gross financial flows to East Asia with serious magnitude. However, this effect is reversed with decreased magnitude as the operation continues. This could partially be due to peoples' adaption to ever growing expectation to the continued operation of QE by the United States.

When table 3 estimation is conducted using only Latin American countries, we can observe results as in table 5.

Overall US QE effects on gross financial inflow to Latin America can be interpreted as following: gross financial inflow in previous year, lagged M2 US, 3-month treasury bill rate and yield curve had statistically significance impact on gross financial flow today apart from US nominal GDP as control variable. Surprisingly, US QE cannot be said to have spillover impacts to Latin America due to lack of statistical significance.

Table 5: US QE effects on Latin America

Random Effects GLS estimation		
Number of observation	112	
R-sq overall	0.884	
Variable	**Coefficient**	**Significance level**
GFI_t1	0.598	***
	[0.000]	
Lagged M2 US	137.535	*
	[0.134]	
3 Month T-bill	57.585	**
	[0.091]	
Yield curve	-2.423	***
	[0.011]	
Lagged growth differential	-0.082	
	[0.432]	
Interest rate differential	-0.015	
	[0.634]	
VIX	-0.088	
	[0.716]	
US Nominal GDP	-159.820	***
	[0.022]	
World aggregate saving	20.041	
	[0.401]	
US QE		
1	-0.608	
	[0.643]	
2	-0.321	
	[0.565]	
3	0.060	
	[0.906]	
_cons	(omitted)	

***p<0.05, **p<0.10, *p<0.15

Regarding how to interpret other independent variables, 1% increase in gross financial inflow of the previous year can lead to 0.598% increase in the gross financial inflow in current year at 5% significance level. Furthermore, the elasticity of GFI with lagged M2 level of US is positively correlated at 137.54% at 15% significance level.

The elasticity of GFI with 3-month treasury US bill is positively correlated at 57.58% at 10% significance. As the difference between the long-term yield and short-term yield in the US gets bigger by 1%, it affects GFI about 2.42% negatively at 5% significance. As lagged growth differential widens by 1%, GFI flow decrease by 8.2% with no statistical significance. As interest rate differential widens by 1%, GFI flow decreases by 1.5%. 1-unit change in VIX led to 8.8% decrease in GFI. Finally, our main variable of interest which is US QE affects negatively to GFI flow to Latin America for QE period 1 and 2 with no statistical significance. For both QE 3, QE affected positively to GFI flow despite lack of statistical significance.

What we can conclude from the results shown in table 3 and 4, is that US Quantitative Easing affects positively on Asia with serious magnitude for QE 1. Later, the magnitude and gross financial inflow to Asia reverts to outflow as QE operation progresses. For Latin America, US Quantitative Easing cannot be said to have any impact on gross financial inflow to Latin America. This could be partly due to the fact that Latin America might not have been the optimal destination of investment post financial crisis.

Now that we have seen the effects of US QE on Asia and Latin America, in section 4.2 this paper will analyze the effect of Japanese QE operation on Asia and Latin America using the same estimation method utilizing Japanese 3-month Japanese treasury bill rate, Japanese Yield Curve, interest rate differential to Japan's real interest rate, lagged growth differential to Japan and other controlled Japanese variables.

4.2 Japan QE overall effect

Table 6: Japan's QE overall effects on Asia and Latin America

Random Effects GLS estimation		
Number of observation	237	
R-sq overall	0.877	
Variable	**Coefficient**	**Significance level**
GFI_t1	0.496	***
	[0.000]	
Lagged M2 JPN	-1.092	
	[0.976]	
3-month bill JPN	-1.314	
	[0.797]	
Yield Curve JPN	13.772	**
	[0.075]	
Lagged Growth differential JPN	-0.119	***
	[0.013]	
Interest rate differential JPN	-0.036	**
	[0.060]	
VIX	0.076	
	[0.479]	
Credit (%GDP)	0.025	***
	[0.014]	
JPN QE		
1	0.896	**
	[0.072]	
2	-3.385	***
	[0.014]	
3	-0.668	*
	[0.118]	
4	-2.604	
	[0.181]	
_cons	17.832	
	[0.976]	

***p<0.05, **p<0.10, *p<0.15

Overall Japanese QE effects on gross financial inflow as we can see from table 6, can be interpreted as following: First, 1% increase in gross financial inflow of the

previous year can lead to 0.496% increase in the gross financial inflow in current year at 5% significance level. Furthermore, the elasticity of GFI with lagged M2 level of Japan is negatively correlated at 109.2% albeit not significant. The elasticity of GFI with 3-month Japanese treasury bill is negatively correlated at 13.77% with no statistical significance. As the difference between the long-term yield and short-term yield in the US gets bigger by 1%, it affects GFI about 13% positively at 10% statistical significance. As lagged growth differential widens by 1%, GFI flow decrease by 11% at 5% statistical significance. As interest rate differential widens by 1%, GFI flow decreases by 3% at 10% significance level. 1-unit change in VIX led to 7.6% increase in GFI although not significant. Finally, our main variable of interest which is Japanese QE affects positively to GFI for the first QE operation and negatively from second operation onwards with decreasing significance.

Contrary to table 2 where US QE showed negative effects to Asian and Latin America together for all of 3 separate events, we Japanese QE showed positive impacts for the first QE operation and negative impacts for the other three operations. Now whether same outcome will hold true when table 6 estimation is conducted on Asia and Latin America separately will be shown in Table 7 and 8 respectively.

When the impact of Japanese QE operation is focused only in Asia as seen in table 7, the effects measured by the gross financial inflow to Asia can be interpreted as following: First, 1% increase in gross financial inflow of the previous year can lead to 0.37% increase in the gross financial inflow in current year at 5% significance level.

Table7: Japanese QE effects on Asia

Random Effects GLS estimation		
Number of observation	125	
R-sq overall	0.936	
Variable	**Coefficient**	**Significance Level**
GFI_t1	0.370	***
	[0.000]	
M2 JPN	-5.214	
	[0.913]	
3-month bill JPN	-6.634	
	[0.336]	
Yield Curve JPN	18.274	***
	[0.047]	
Lagged growth differential JPN	-0.061	
	[0.276]	
Interest rate differential JPN	-0.061	***
	[0.041]	
VIX	0.003	
	[0.981]	
Credit (%GDP)	0.029	***
	[0.015]	
JPN QE		
1	-2.118	***
	[0.021]	
2	-5.194	***
	[0.016]	
3	-1.459	*
	[0.129]	
4	-4.178	**
	[0.101]	
_cons	86.078	
	[0.910]	

***p<0.05, **p<0.10, *p<0.15

As the difference between the long-term yield and short-term yield in the Japan gets bigger by 1%, it affects GFI about 18% positively at 5% significance level. As interest rate differential widens by 1%, GFI flow decreases by 6%. Finally, our main variable of interest which is Japanese QE affects negatively to GFI flow to Asia

for all of the four separate operations with decreasing significance. The observed results may be due to Japanese zero bound rate along with low growth potential.

In table 8, effects of Japanese QE on Latin America is shown.

Table 8: Japanese QE effects on Latin America

Random Effects GLS estimation		
Number of observation	112	
R-sq overall	0.888	
Variable	**Coefficient**	**Significance Level**
GFI_t1	0.612	***
	[0.000]	
M2 JPN	37.748	
	[0.512]	
3-month bill JPN	23.403	***
	[0.010]	
Yield Curve JPN	14.950	
	[0.220]	
Growth differential JPN	-0.100	
	[0.332]	
Interest rate differential JPN	-0.011	
	[0.724]	
VIX	0.211	
	[0.224]	
Credit (%GDP)	0.110	*
	[0.114]	
JPN QE		
1	2.105	***
	[0.031]	
2	-14.220	*
	[0.108]	
3	-9.440	*
	[0.137]	
4	(empty)	
_cons	-611.435	
	[0.508]	

***p<0.05, **p<0.10, *p<0.15

When the impact of Japanese QE operation is focused only in Latin America,

the effects measured by the gross financial inflow to Latin America can be interpreted as following: First, 1% increase in gross financial inflow of the previous year can lead to 0.612% increase in the gross financial inflow in current year at 5% significance level. The elasticity between the 3-month government bill and GFI is 23% at 5% significance level. Finally, our main variable of interest which is Japanese QE affects positively to GFI flow to Latin America for the initial QE operation and negatively for the other operations at decreasing significance level. The observed results may be due to Japanese zero bound rate along with low growth potential.

In section 4.3 effects of QE for the period where US and Japan QE operation schedule overlaps will be shown by computing the point average for the variables that were previously designated either to US or to Japan.

4.3 US Japan overlapping QE overall effect

What we notice from above results is that 1% in GFI in previous year lead to 0.49% increase in GFI in current year at 5% significance level. The greater the gap of between the long-term yield and short-term yield of the US and Japan average are, GFI is affected positively with 5% significance. The elasticity between the point average of 3month bill of US - Japan and GFI is 5.09% with 5% significance level. 1% increase in interest differential to US-Japan lead to 3.8% increase in GFI at 15% significance level.

Table 9: US-Japan QE overall effect on Asia and Latin America[5]

Random Effects GLS estimation		
Number of observation	192	
R-sq overall	0.89	
Variable	**Coefficient**	**Significance Level**
GFI_t1 USJPN average	0.490	***
	[0.000]	
USJPN M2lag average	0.118	*
	[0.621]	
USJPN Yield average	5.099	***
	[0.027]	
USJPN 3-month bill rate average	3.667	***
	[0.001]	
USJPN average interest differential	0.038	*
	[0.105]	
USJPN average growth differential	-0.044	
	[0.193]	
VIX	-0.027	
	[0.803]	
Credit (%GDP)	0.017	*
	[0.110]	
QE		
US QE1	-0.738	
	[0.573]	
US QE2	-2.703	***
	[0.026]	
US QE3	-0.187	
	[0.701]	
JPN QE2	0.870	
	[0.667]	
JPN QE 4	0.489	
	[0.478]	
US JPN mutual	1.723	***
	[0.008]	

***p<0.05, **p<0.10, *p<0.15

[5] All the overlapping periods are compiled as US JPN mutual period and other QE variables such as US QE and JPN QE variables are time periods excluding the overlapping periods.

Among the quantitative easing variable, US QE 2 which showed statistical significance showed negative impact in gross financial inflow to other countries. For the period where US and Japanese QE operation periods overlap, the spillover effects measured by gross financial inflow to Asia and Latin America showed positive impact at 5% significance level.

When the estimation in table 9 is conducted using only Asia, results shown in table 10 can be observed.

When the estimation is conducted only using Asian countries, except for US-Japan 3-month bill, variables such as GFI previous year, yield average and interest differential affected GFI positively with statistical significance. When we look closely into QE variable, we can notice that among the QEs that showed statistical significance, US QE alone posed negative spillover impact to Asia whereas Japanese QE posed positive impact to Asia. Furthermore, for the periods of mutual QE, Asia was affected positively at about 18%[6] from both QEs albeit at a 15% significance level.

[6] Coefficient of indicator variable can be found by calculating exp(coefficient)

Table 10: US-Japan mutual QE effect on Asia

Random Effects GLS estimation		
Number of observation	86	
R-sq overall	0.967	
Variable	**Coefficient**	**Significance Level**
GFI_t1 US-JPN average	0.356	***
	[0.001]	
Lagged US-JPN M2 average	-0.027	
	[0.949]	
US-JPN Yield average	9.283	**
	[0.066]	
US-JPN 3month bill rate average	2.028	
	[0.931]	
US-JPN average interest differential	0.155	***
	[0.000]	
Lagged US-JPN average growth differential	-0.035	
	[0.552]	
VIX	-0.192	
	[0.201]	
Credit (%GDP)	0.039	***
	[0.003]	
QE		
US QE1	0.694	
	[0.769]	
US QE2	-5.076	***
	[0.012]	
US QE3	-1.180	**
	[0.103]	
JPN QE2	1.807	
	[0.485]	
JPN QE 4	2.105	**
	[0.084]	
US JPN mutual	2.932	*
	[0.135]	
_cons	(omitted)	

***p<0.05, **p<0.10, *p<0.15

Table 11 is the results gathered using table 9 estimation limiting the estimation only using Latin American countries.

Table 11: US-Japan mutual QE effect on Latin America

Random Effects GLS estimation		
Number of observation	106	
R-sq overall	0.922	
Variable	**Coefficient**	**Significance Level**
GFI_t1 US-JPN average	0.588	***
	[0.000]	
Lagged US-JPN M2 average	0.098	**
	[0.776]	
US-JPN Yield average	4.111	
	[0.272]	
US-JPN 3month bill rate average	3.101	**
	[0.079]	
US-JPN average interest differential	-0.015	
	[0.697]	
Lagged US-JPN average growth differential	-0.045	
	[0.364]	
VIX	0.063	
	[0.778]	
Credit (%GDP)	-0.033	
	[0.510]	
QE		
US QE1	-1.875	
	[0.362]	
US QE2	-2.350	
	[0.229]	
US QE3	-0.196	
	[0.785]	
JPN QE2	-0.550	
	[0.874]	
JPN QE 4	-1.278	
	[0.186]	
US JPN mutual	1.270	
	[0.190]	
_cons	(omitted)	

***p<0.05, **p<0.10, *p<0.15

When the estimation is conducted using only Latin American countries, GFI in previous year, lagged M2 average, and 3-month bill average affected positively to GFI

today. Our main variable of interest QE showed negative effect independently both for US and Japan whereas mutual period showed positive impact. However, because none of the QE variable showed statistical significance, final effects of US-Japan mutual QE on gross financial inflow to other countries are dubious.

5. Conclusion

5.1 Finding

What we found from US QE is that initially QE's role in gross financial inflow to Asia and Latin American countries diminish with decreasing significance. Asia for example was affected positively for QE 1 and negatively for QE 3. Latin America cannot be said to be either positively or negatively affected by the US QE due to lack of statistical significance.

The overall impact of Japanese QE is that for QE 1, Asia and Latin America were affected positively. And from second BOJ QE operation onwards the Asia and Latin America were affected negatively with diminishing magnitude. When we look at the impacts of Japanese QE on Asia only, all of the four separate QE operations posed negative impact on Asia with decreasing significance level. Latin America on the other had was affected positively for the first quantitative easing and negatively for the other three operations.

When US and Japanese QE are considered together what we could observe was the reverse. For overall impact of joint QE on Asian and Latin America, only Japanese QE had positive spillover impacts on GFI whereas US QE showed negative impacts. QE mutual variable showed greater magnitude with strong significance. Even when the test was limited to Asian countries only, both independent Japanese QE and US-Japan mutual QE showed positive impacts to Asia whereas US QE alone showed

negative impacts. When the test was confined only for Latin America, we could not observe any specific spillover impacts on Latin America from Japanese QE that is statistically significant. Similar to the findings from McKinnon, Liu and Kawai paper (2013), when US and Japanese QE are considered together, East Asian countries were indeed affected positively from both Japanese QE alone as well as overlapping QE periods. Because Latin American countries could not be concluded to be affected by either independent QE or mutual QE, this paper's first hypothesis is proven to be partially true only for Asian countries.

Regarding second hypothesis which was effects of mutual QE will be smaller in the same direction, we could observe that US QE alone exerts positive impacts on gross financial flow to Asia for QE 1 and negative impacts for QE 2 onwards. Japanese QE alone exerted negative impacts to Asia. However, for the period where US and Japanese QE overlaps, the QE definitely exerts positive impacts in terms of gross financial flow. For Latin America, US QE alone exerted no significant impact on gross financial flow similar to overlapping QE period whereas Japanese QE alone exerted negative impact on gross financial flow. Consequently, for Asia whether the impact of QE is positive or negative is rejected and no statement can be made for Latin America.

Regarding this paper's third hypothesis, the reliability of spillover impact to Asian and Latin America diminishing as QE operation progresses measured by significance level of QE variable was true for Latin America as seen in both US and Japan QE effects. However, for Asia under US QE variable, people responded with

greater sensitivity as quantitative easing operation progresses.

5.2 Limitation

There exist many limitations on this paper. Lim, Mohapatra and Stocker's "Tinker, Taper, QE, Bye?" paper is the main source of this paper where this paper adopted the foundation estimation methodology. Some of the variables where the author got the data from such as EPFR global which was used to access global financial bonds and equities inflow, institutional investor risk rating which was used to assess country specific risk rating and JP Morgan's global composite purchasing managers' index which was used to assess sensitivity to short term or long-term growth expectations require exclusive permission to access the data. Even though Lim et al. have shown that they are statistically significant, due to my limited access, above three variables which might have affected the outcome of the results are omitted from this paper's research.

In addition, from the list of countries found in Appendix I, Asian and Latin American countries such as Maldives, Mongolia, Cuba, Haiti, Taiwan, Brunei, Nepal, Bhutan, Myanmar lack a lot of data. Taiwan for example, although known as one of Asian tiger economies is not considered as a country in many of the international organizations. Small island countries like Maldives, Cuba, Haiti frequently do not report data even at annual level. Even though these are sufficient reasons to drop the country from sample scope completely, because 42 countries were relatively small

sample size, no countries were dropped during calculation even if they lack specific variable data.

The estimation model used in the main reference paper by Lim et al. did not have any application to Japanese QE. Simple assumption to apply the same model to not only Japanese QE effect estimation and joint QE effect estimation might not be the most desirable estimation method.

Similarly, cubic spline interpolation estimation method which can be used to find sub data by drawing the smooth curve line in between the observed data do have its downsides. Due to nature of cubic function when two adjacent yearly data contain almost equal value, in between values can contain even negative values. Furthermore, when observed data is concentrated only in the middle extension of data through cubic spline estimation can overestimate the value beyond the true value. Consequently, compiling both quartely and annual data, keeping tail end values as missing values when missing rather than estimating minimizes statiscal error.

Finally, in this paper, for statistical consistency, variables such as FDI, portfolio investment amounts were gathered from IMF statistics via DataStream even thoguh national central bank data exist. Although this process can reduce the likelihood of mistakes occurring during conversion to single currency and can take into consideration for countries like China where certain data are over or under reported. This may not have been the most optimize way to gather certain data.

5.3 Implication

How the tests results turned out to be different from literature review if the periods of US and Japan QE are considered together provides reasonable room for further consideration regarding previous findings by others. If this paper's result is further strengthened by taking into consideration for the bigger number of sample countries, sample periods and inclusion of variables such as JP Morgan's global composite purchasing managers' index, institutional investor risk rating and EPFR data, this paper paves the way for additional inclusion of ECB QE as well.

Bibliography

Blackden, Richard. 2012. "Brazil President Dilma Rousseff Blasts Western QE As 'Monetary Tsunami'". *Telegraph.Co.Uk*. http://www.telegraph.co.uk/finance/economics/9196089/Brazil-president-Dilma-Rousseff-blasts-Western-QE-as-monetary-tsunami.html.

Bun, Maurice J.G, and Martin A Carree. 2005. "Bias-Corrected Estimation In Dynamic Panel Data Models". Journal of Business & Economic Statistics 23 (2): 200-210. doi:10.1198/073500104000000532.

"Business Day > Image >". 2011. *Nytimes.Com*. http://www.nytimes.com/imagepages/2011/01/11/business/11fed-gfx.html?action=click&contentCollection=Economy&module=RelatedCoverage®ion=EndOfArticle&pgtype=article.

"Country Classification". 2014. *Un.Org*. http://www.un.org/en/development/desa/policy/wesp/wesp_current/2014wesp_country_classification.pdf.

Chinn, Menzie D. 2013. *Global Spillovers and Domestic Monetary Policy*. Ebook. BIS Working Papers. https://www.bis.org/events/conf130620/chinn.pdf.

Eichengreen, Barry. 2013. "Currency War or International Policy Coordination?". *Journal of Policy Modeling* 35 (3): 425-433. doi:10.1016/j.jpolmod.2013.03.006.

Fratzscher, Marcel, Marco Lo Duca, and Roland Straub. 2012. "A Global Monetary Tsunami? On the Spillovers of US Quantitative Easing". *SSRN Electronic Journal*, 1-60. doi:10.2139/ssrn.2164261.

Hendricks, Torben, and Bernd Kempa. 2008. "Asymmetric Transmission Of Monetary Policy In Europe: A Markov-Switching Approach". Journal Of Economic Integration 23 (4): 873-895. doi:10.11130/jei.2008.23.4.873.

Kawai, Masahiro. 2015. "International Spillovers of Monetary Policy: US Federal Reserve's Quantitative Easing and Bank of Japan's Quantitative And Qualitative Easing". *ADBI Working Paper Series*, no. 512: 3-25. doi:10.2139/ssrn.2554284.

Lavigne, Robert, Subrata Sarker, and Garima Vasishtha. 2014. *Spillover Effects of Quantitative Easing on Emerging-Market Economies*. Ebook. Bank of Canada. http://www.bankofcanada.ca/wp-content/uploads/2014/11/boc-review-autumn14-lavigne.pdf.

Lim, Jamus Jerome, Sanket Mohapatra, and Marc Stocker. 2014. *Tinker, Taper, QE, Bye?: The Effect of Quantitative Easing on Financial Flows to Developing Countries*. Ebook. Washington: World Bank. http://documents.worldbank.org/curated/en/570101468341335746/Tinker-taper-QE-bye-the-effect-of-quantitative-easing-on-financial-flows-to-developing-countries.

McKinnon, Ronald, and Zhao Liu. 2013. "Modern Currency Wars: The United States Versus Japan". SSRN Electronic Journal 437: 1-25. doi:10.2139/ssrn.2338340.

Moore, Jeffrey, Sunwoo Nam, Myeongguk Suh, and Alexander Tepper. 2017. *Estimating the Impacts of U.S. LSAPs On Emerging Market Economies' Local Currency Bond Markets*. Ebook. NY. https://ideas.repec.org/p/fip/fednsr/595.html.

Neely, Christopher J. 2015. "Unconventional Monetary Policy Had Large International Effects". *Journal of Banking & Finance* 52: 101-111. doi:10.1016/j.jbankfin.2014.11.019.

"VIX Index". 2017. *Cboe.Com*. http://www.cboe.com/products/vix-index-volatility/vix-options-and-futures/VIX-index.

DataStream

World bank databank (WDI)

Federal Reserve Bank of St. Louis

IMF International Financial Statistics

BIS Locational Banking

Appendix

List of Countries

Latin America	Asia
Argentina	Mongolia
Bolivia	Taiwan
Brazil	China
Chile	Korea
Colombia	Maldives
Costa Rica	Lao
Cuba	Myanmar
Dominican Republic	Vietnam
Ecuador	Cambodia
El Salvador	Thailand
Guatemala	Malaysia
Haiti	Brunei
Honduras	Singapore
Mexico	Indonesia
Nicaragua	Philippines
Panama	India
Paraguay	Nepal
Peru	Bhutan
Uruguay	Pakistan
Venezuela	Bangladesh
	Sri Lanka
	Hong Kong

Extended list of Countries

Albania	China	Brazil
Macedonia	Hong Kong	Chile
Belarus	Indonesia	Colombia
Georgia	Malaysia	Ecuador
Kazakhstan	Myanmar	Paraguay
Kyrgyzstan	Papua New Guinea	Peru
Russia	Philippines	Uruguay
Ukraine	Korea	Venezuela
Algeria	Singapore	Austria
Egypt	Thailand	Belgium
Libya	Vietnam	Denmark
Mauritania	Bangladesh	Serbia
Morocco	India	Bosnia and Herzegovina
Tunisia	Iran	Finland
Cameroon	Nepal	France
Chad	Pakistan	Germany
Equatorial Guinea	Sri Lanka	Greece
Burundi	Bahrain	Ireland
Kenya	Iraq	Italy
Madagascar	Israel	Luxembourg
Rwanda	Jordan	Netherlands
Tanzania	Kuwait	Portugal
Uganda	Oman	Spain
Angola	Qatar	Sweden
Botswana	Saudi Arabia	United Kingdom
Lesotho	Syrian Arab Republic	Bulgaria
Malawi	Turkey	Croatia
Mauritius	United Arab Emirates	Cyprus
Mozambique	Yemen	Czech Republic
Namibia	Armenia	Estonia
South Africa	Azerbaijan	Hungary
Zambia	Barbados	Latvia
Zimbabwe	Dominican Republic	Lithuania
Benin	Guyana	Malta
Burkina Faso	Haiti	Poland
Cabo Verde	Jamaica	Romania
Cote D'ivoire	Trinidad and Tobago	Slovakia
Gambia	costa Rica	Slovenia
Guinea-Bissau	El Salvador	Iceland
Mali	Guatemala	Norway
Niger	Honduras	Switzerland
Nigeria	Mexico	Australia
Senegal	Nicaragua	Canada
Sierra Leone	Panama	New Zealand
Togo	Argentina	United States
Brunei	Bolivia	Japan

논 문 초 록

국제적 ‘화폐공급과잉’이라는 표현이 2012 년 브라질 딜마 루세프 대통령에 의하여 처음 소개된 이후부터, 미국, 일본, 유럽연합과 같이 개별 국가가 실행하는 양적완화가 타국에 주는 연구만 넘쳐났다. 하지만, 미국과 일본같이 양적완화가 동시다발적으로 겹치는 기간에 있는 것을 발견하여 기존 개별 국가가 양적완화를 통하여 타국에 주었던 영향력에 대한 고찰을 하려한다. 고정효과모형을 활용하여 미국과 일본의 양적완화가 겹치는 기간을 중점적으로 2007 년부터 2014 년의 데이터를 활용하여 남미 20 개국과 아시아 22 개국에 주는 영향을 유입된 자본의 흐름을 통하여 분석한다. 이 논문은 해당 기간 동안 아시아 국가들이 유입된 자본량의 약 18.7% 정도가 양적완화에 의하여 긍정적 영향을 받았고, 남미 국가들은 거의 영향을 받지 않았다는 사실을 보여준다. 이 논문의 결과를 바탕으로 다른 양적완화들이 겹치는 기간에 대한 기존 연구들의 결과를 재평가해 볼 여지를 남겨준다.

주 요 어 : 화폐공급과잉, 미국 양적완화, 일본 양적완화,
아시아의 파급효과, 남아메리카 파급효과, 고정효과모형

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