CHAPTER 1

Introduction

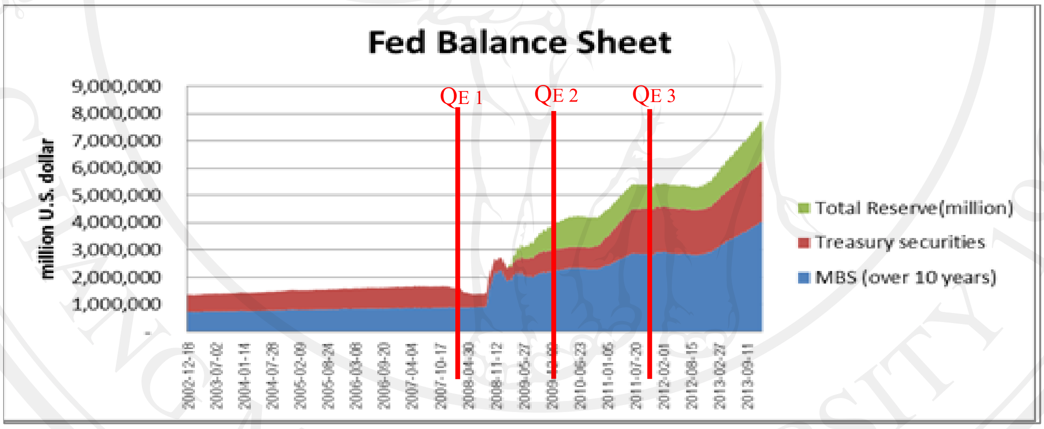
1.1 The Rationale Background

The world economy has faced with the global financial crisis many times. Many advanced counties have been employed on expansionary monetary and fiscal policy to stabilize an economy. However, the constraint of monetary and fiscal policy and nominal interest rates were close to zero bound (0.25%), monetary policy seem to insufficient to boost the economy. So, advanced countries have to use the unconventional policy to increase the money supply in order to deal with the financial crisis. In particularly, the advent of global financial crisis (GFC) in the United States (U.S.) in 2008 called ‘Subprime mortgage crisis’, they has used unconventional policy call “quantitative Easing (QE)” by expansion the Federal Reserve’s (Fed) balance sheet.

Quantitative Easing (QE) is an unconventional monetary policy used by central bank to stabilizes the financial economy and promote growth policy by buying financial assets from commercial bank and others financial institute and cut the interest rate for the purpose of injecting the money in the domestic economy, restoring the financial market functioning and reducing tail risk consequently both foreign and domestic investors will be confidence in the economic condition. It was tried first by a central bank of Japan to resolve their deflation following its asset bubble burst in 1990s.

Since the financial crisis in 2007, Quantitative Easing (QE) has been used by The United states (U.S.), the United Kingdom and Euro zone. In particularly, U.S. quantitative Easing, Chen, Filardo, He and Zhu (2011) revealed that it was a sizeable expansionary impact on the emerging economies than other advanced economies. The U.S. Federal Reserve (FED) has been announced 3 rounds. The first round of quantitative Easing, QE1 , was announced to buy a bank debt, mortgage-backed securities(MBS), and Treasury securities from financial institute in late November

2008, which was extend to 30 October 2009. The asset purchases were approximately 1.7 trillion dollars. In November 2010, the Fed announced a second round of quantitative Easing, buying $600 billion of Treasury securities. In 13 September 2012, the Fed announced a third round of quantitative Easing, decided to boost $40,000 million per month, open-ended bond purchasing program of agency mortgage-backed securities. Moreover, in 13 December 2012, the Fed announced of expanding the quantitative Easing, expanded the financial amount in order to buy a treasury bill 45,000 million dollars per month and continues to expand the QE3 besides. So, in this round, FED has injected the money 85,000 million dollars per month. According to figure 1.1 show the expansion in the Fed's asset as a result of the QE programs since the first round of QE program. The asset of Fed including Mortgage backed securities and U.S. Treasury bill have increase rapidly since December 2008 and it remain high in place today.

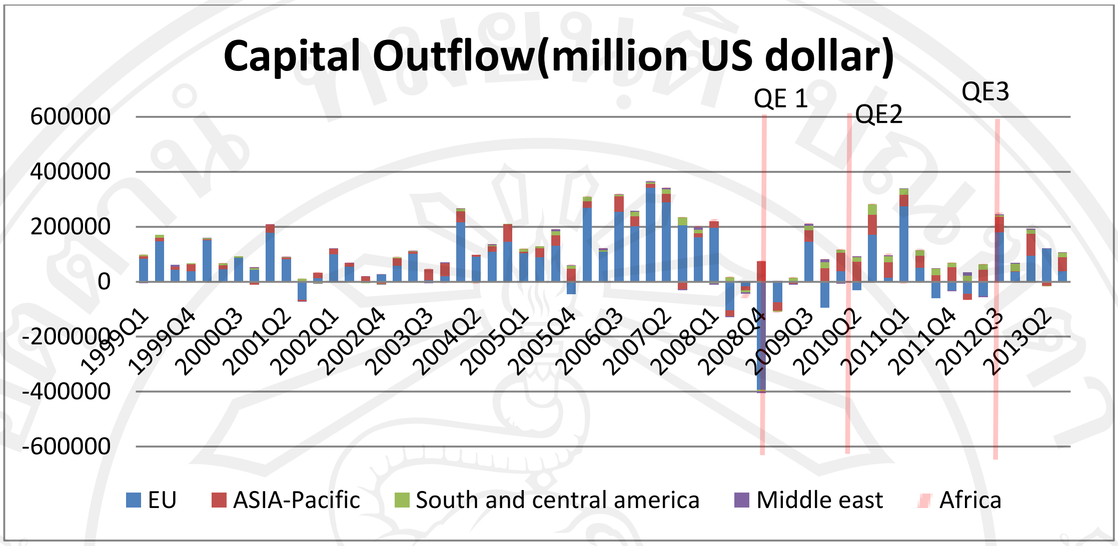


Source: www.federalreserve.gov (access 19 Jan. 2014)

Figure 1.1 The Federal Reserve Balance Sheet, 2002-2013

After Quantitative Easing (QA) has been announced ,the amount of private security holds are decrease while the purchases bid up the price of the asset and hence lower its yield. The expected return on the security has to fall therefore the private investor, both resident and non-resident, are willing to adjust their portfolio. Moreover, the U.S. public debt has been raised from 70% of GDP to 100% of GDP since QE was first announced. This can affect portfolio decisions and asset price by altering confidence of investors who understood that economic condition are worse than expected, thereby triggering to safety. These effects would be expected to spillover into other assets that are similar in nature, to the extent that investors are willing to substitute between the assets

(Krishnamurthy and Vissing-Jorgensen , 2011). As a result, it made contributions to the sharp rebound of capital inflows to the rest of the world (Figure 1.2).

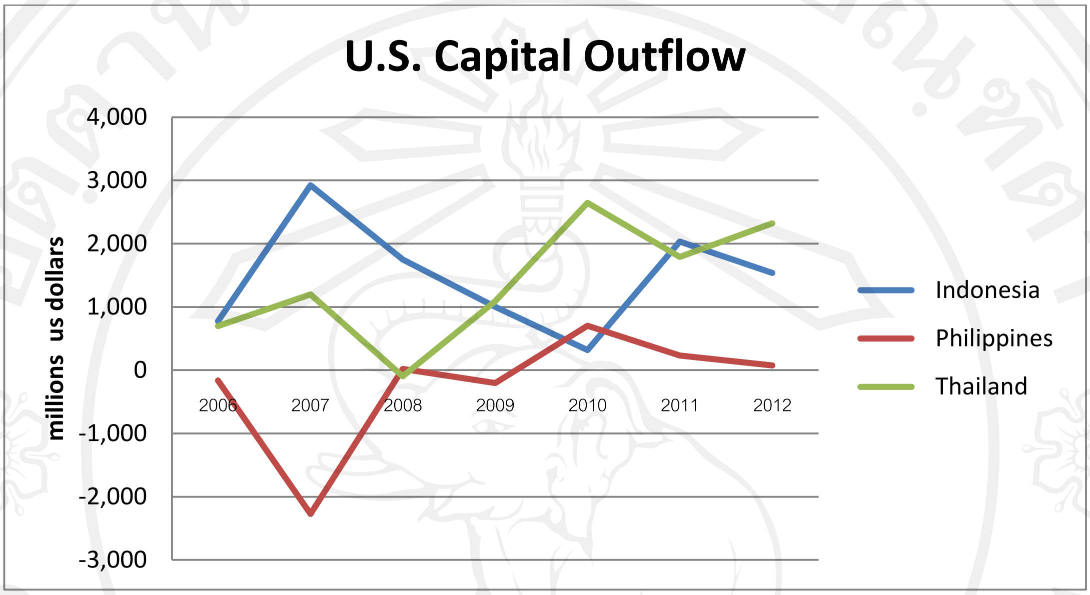


Source:www.bea.gov(access 17 Jan 2014)

Figure 1.2 The U.S. Capital Outflow, 1999-2013

Among the five regions, the capital outflows to Europe (EU) during the QE programs period were actually larger than other regions, followed by Asia-Pacific, South and Central America, Middle East and Africa. The aggregated size of capital outflows rapidly increase before the GFC in 2008. It then sharply increases again after the QE1 has been announced. However, we found that the level of capital outflow the rest of the world is not different when comparing between pre and post the advent of QE. But if we consider in each region, we found that the size of capital outflows increase in Asia-Pacific(red bar) because the investor wanted to reduce a tail risks and avoided the lowering bond yield rates in U.S.A., they redirected capital inflows toward Asia (Cho and Rhee, 2013). Lim, Mohspatra, and Stoker (2014) confirm that between 2000 and mid-2013, annual gross capital inflows to emerging countries grew to 1.8 trillion per annum.

Nowadays, the world economy become more globalization, Asian economic systems are interacted by each other. The Asian financial has been changed, such as the emergence of new capital markets, abolishment of capital inflow barrier and foreign exchange restriction or adoption of flexible exchange rate, in order to increase the opportunity of investment. Thus, the adoption of QE programs by Fed has impacted to Asia in various ways. There is significant evidence that QE programs impact to Asian emerging markets. For instance, Morgan (2011), Chen, Filardo, He and Zhu (2012), and Cho and Rhee (2013) finds a significant impact of U.S. quantitative Easing, which lowered emerging Asian bond yields, boosted stock prices and exerted upward pressures on exchange rates against the dollar.



Source:www.bea.gov(Access 2 January 2014)

Figure 1.3 The U.S. Capital Outflow, 2006-2012

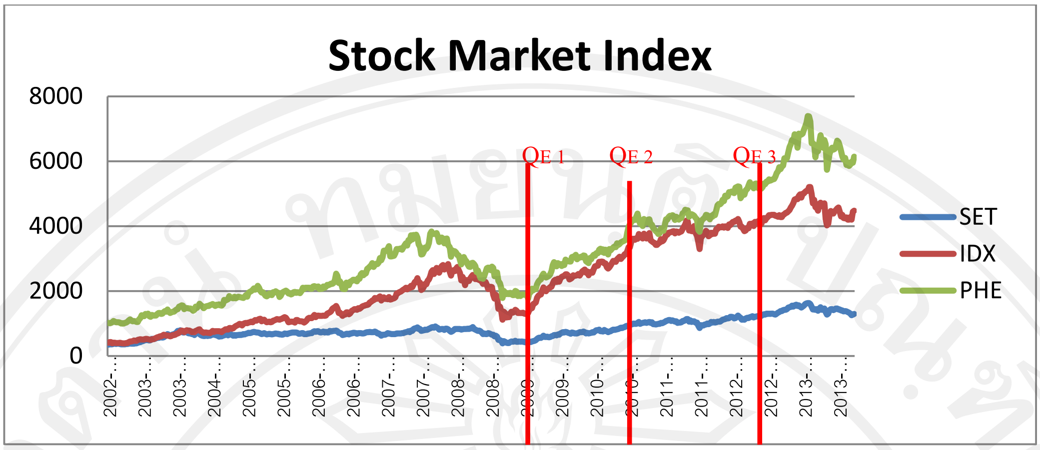
Thailand, Indonesia and Philippines (TIP) are newly industrial country in Southeast Asia which has a largely invest dependent which receives the effect of U.S. capital inflows because it is an emerging market which has abolishment of capital inflow barrier and foreign exchange restriction. In recent years, TIP have been considerable interest to U.S. investors who expected the high return because the capitals inflows to these 3 countries had increased 50%, 47% and 70% , respectively between 2006-2012 (Figure 1.3) while Asia pacific increases averaged 37%. These mean that TIP have a potential to absorb the capital inflow. Therefore, this capital flows would impact to the domestic economies in various way in particularly the stock market and bond market. Moreover, this unconventional monetary policy has raised the inflation and depreciates a country's exchange rates versus other currencies because it occur an oversupply of dollar in the money market. Besides, maintaining the low interest rate at 0.25%, results in the capital outflow to TIP capital markets and emerging market which has higher economic performance and return. Siourounis (2004) confirmed that an increase in capital mobility has impacted exchange rate movement. According to Mundell-Fleming approach, an increase in money supply lead to reduces the domestic interest rate lower than global interest rate. This depreciates the exchange rate of domestic currency through capital outflow. Consequently, the dollar value has weakened against TIP currencies (Table 1.1). However, under effect of the QE Taper talk, the value of exchange rates had depreciated in 2013.

Table 1.1 Exchange Rate in TIP Emerging Countries, 2004-2013

Currency	No Quantitative Easing					
	2004	2005	2006	2007	2008	Average
THB/USD	39.15	40.965	35.81	33.755	34.78	46.115
IDR/USD	9,308	9,858	9,055	9,390	10,950	12,140.25
PHP/USD	56.275	53.015	49.16	41.29	47.55	61.8225
Currency	Quantitative Easing					
	2009	2010	2011	2012	2013	Average
THB/USD	33.34	30.16	31.545	30.665	32.3	31.602
IDR/USD	9433	9014	9165	9707	12151	9894
PHP/USD	46.23	43.87	44.005	41.17	44.27	43.909

Source: Thomson Reuters Data, 2013

A stock market is a public being for the trading of company stock (shares). It was established in order to mobilize funds to support industrialization and economic development. This market has an important role to TIP economies and attractive foreign investors. The stock market reflects on the domestic economy. When shares price are high, the value of the firm relative to the replacement cost of its stock of capital is also high (Tobin, 1969). There are many listed companies associated with the stock market because this market is a channel for savers to invest their wealth to the loaner such as companies or governments in long term debt. It is one of the most important sources for companies to raise the money in order to expand their business. The important indices of the TIP stock exchange are the Stock Exchange of Thailand (SET), Jakarta Composite Index (JKSE or IDX) and Philippine Stock Exchange composite index (PSEi). The market participants include individual retail investor, institutional investors and foreign investors. The market capitalization has been increased 176% on average since 2008.



Source: Thomson Reuters Data, 2013

Figure 1.4 The Effect of QE on Stock Market Index, 2006-2013

According to figure 4 shows the price of the stock index in TIP during QE1, QE2 and QE3. It is seem that each program of QE lead to increase the price of all stock indexes, especially the Indonesia stock market, which increase 215% since the first round of QE has been announced. On the evidence of this chart, therefore, conclude that QE has positive effect to stock Index since it has been announced

Table 1.2 Bond Market Trading Volumes in TIP Emerging Countries, 2004-2013

(USD billions)

	No Quantitative Easing				
	2005	2006	2007	2008	Average
Thai	95.71	115.49	306.57	520.29	259.515
Indonesia	27.75	41.02	73.73	52.53	48.7575
Philippines	83.59	69.27	67.61	63.06	70.8825
	Quantitative Easing				
	2009	2010	2011	2012	Average
Thai	425.7	532.97	568.91	637.99	541.395
Indonesia	41.72	65.42	118.61	113.79	84.885
Philippines	76.31	121.08	133.58	155.8	121.6925

Source: www.asianbondsonline.adb.org

Bond market is a financial market where the loaner can issue new debt in form of bonds, notes and bill to investor in the primary market and the investors can resell their debt securities to another investor in the secondary market. The primary goal of the bond market is to expand the liquidity for private and public sector. A bond market in TIP has grown rapidly in term of trade volume following the first QE announcement (Table 1.2). It has grown 67% since the year 2009, propelled by growth in both the government bond and corporate bond sectors. The most rapidly growing bond market was Indonesia (173%), followed by Philippines (104%) and Thailand (50%) between 2009-2012. Therefore, bond markets in TIP have become more attractive for private and institutional investors.

Nowadays, however, Fed begins tapering the QE, winding down its bond purchasing, $20,000 million per month since November, 2014 and they aim to end the program if the economic condition is recovery as expected. So, this QE tapering will impact to TIP currencies, bond and stock market. Although, Fed are not yet ending the QE program, it has already affected TIP’s stock, bond and currency markets and resulted in capital outflows form the markets. The impact on TIP markets is likely to be very severe. The sharp fall in TIP currencies, bond trade volume and stock index has happen since the Fed’s announced in May, 2013. By January 3, 2014, Thai, Indonesian and Philippines currencies had depreciated 12%, 25%, 8%, respectively. In stock markets, SET, JKSE and PSEi Index has fallen 19%, 12%, and 13% respectively. In bond markets, 10- years government bond yields in Thailand have shot up 62 basis points (bps) since May1,2013; the corresponding rise in Indonesia and Philippines were about 300 bps and 170 bps, respectively.

The impact of QE tapering has increased the volatility of TIP currency, stock and bond market. Thus, the investor will confront with the higher risk and do not have an accurate decision in allocation of the investment. Moreover, many Asia-Pacific firms are exposed to foreign exchange rate risk, particularly to fluctuations in the value of the U.S. dollar (Parslay and Popper, 2003). As a result, this fluctuation of exchange rates will effect on multinationals, high-exporting and importing firms in term of cost or gains. Therefore, studying the movement and interaction between QE and exchange rates, stock and bond market in TIP has become essential for the academician, practitioners, policy makers and investor. They are likely to face with high risk and volatility in the price of stock and exchange rates. Thus, forecasting and estimating the volatility and the duration of the volatility of exchange rates, stock and bond market are importance for apply this result to manage the risk from fluctuation in every markets.

According to above issue, the empirical would like to examine the QE effect on TIP market by using Markov-Switching, Bayesian, Vector Autoregressive (MS-BVAR)

Models as an innovative tool for dating effect of volatility in each period as well as identify the factors that lead an TIP markets from one state to another state and also signal ahead a turbulent regime as an early warning systems. It has been adopted in order to deal with over-parameterization problem which mostly occurred in VAR approach, particularly MS-VAR model (Sims et al, 2008). Brandt and Freeman (2006) suggested to use Bayesian prior on the coefficient matrix of the model to reduce the estimation uncertainty and obtain accurately inference and forecast.

1.2 Purpose of the Study

Dating the effect of volatility as well as identify Quantitative Easing factors that lead an Thailand, Indonesia and Philippines markets (exchange rate market, stock market and bond market) from one regime to another regime and also signal ahead a turbulent regime as an early warning systems.

To forecast the duration and volatility which are affected by Quantitative Easing and Quantitative tapering in TIP markets.

1.3 Advantage of the Study

This thesis provides the new empirical framework, Markov-Switching Bayesian Vector Autoregressive (MS-BVAR), to deal with over-parameterization problem which mostly occurred in VAR approach. Moreover, the estimated parameter provide a magnitude and direction of the impact of Quantitative Easing to Thailand ,Indonesia and Philippines currencies ,stock market and bond market in term of the relationship and volatility transmission in each regime. the academician, practitioners, policy makers and investor can use the results in this study as the path of investment and further analysis.

1.4 Scope of the Study

To understand an impact of U.S. Quantitative Easing to Thailand ,Indonesia and Philippines currencies ,stock and bond market, the raw monthly data, purchasing U.S.'s Mortgage back securities (MBS), purchasing U.S.'s Treasury securities (TS), Fed's balance sheet (FB), Stock exchange of Thailand index (SET), Jakarta Composite Index (JKSE), Philippine Stock Exchange composite index (PSEi), THB/USD (Exth), IDR/USE (Exind), PHP/USD (Exphp), Thai government bond yield (THY), Indonesia government bond yield (INDY) and Philippines government bond yield (PHY) are collected from Thomson Reuters DataStream, from Financial Investment Center (FIC), Faculty of economics, Chiang Mai University and www.federalreserve.gov, for the period 14 January 2009 to 10 July 2014. Whereas, all of these observation have been transform to the first difference form in order to make them stationary because the stationary time series could avoid the spurious regression problem which obtain when using non-stationary time series (Gujarati, 2003).

1.5 Definition

Quantitative Easing is an unconventional monetary policy which employs to stimulate the economy by injecting the money supply to the economy. It has been used when a standard monetary policy has become ineffective**.**

Regime is a level of state or value of the price which remains constant or not change around the state or value of price.

State is the present condition of the economy, including expansion and contraction.

Mortgage Backed Securities is a type of security which collateralized from a specified pool of underlying assets. These securities usually pay periodic payments that are similar to coupon payments. Furthermore, the mortgage must have originated from a regulated and authorized financial institution.

Hot Money is a flows of capital from one country to another country in term of portfolio investment in order to earn the highest short-term interest rates.

Emerging Economies is a country that is progressing toward becoming developed market

Advanced Economies has a highly developed market and advanced technological infrastructure relative to other less developed market**.** They have a high level of gross domestic product per capita, as well as a degree of industrialization.

Spillover Effects is externalities of Quantitative Easing policy that affect those countries which are not directly involved in this policy.