



ADB Working Paper Series

**International Spillovers of Monetary Policy:
US Federal Reserve's Quantitative Easing and
Bank of Japan's Quantitative and Qualitative Easing**

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No. 512
January 2015

Asian Development Bank

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This is a revised version of the paper presented to the International Monetary Fund and Chatham House conference, "New Directions in Policy Coordination," held in Washington, DC on 12 September 2013. The author is grateful to Paul Jenkins, Peter Morgan, and Stephen Pickford for their constructive comments on earlier drafts.

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Suggested citation:

Kawai, M. 2015. International Spillovers of Monetary Policy: US Federal Reserve's Quantitative Easing and Bank of Japan's Quantitative and Qualitative Easing. ADBI Working Paper 512. Tokyo: Asian Development Bank Institute. Available: <http://www.adbi.org/working-paper/2015/01/21/6527.international.spillovers.monetary.policy/>

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Abstract

This paper assesses the impact of unconventional United States (US) and Japanese monetary policies on emerging economies, and explores policy coordination issues to promote macroeconomic and financial stability in developed and emerging economies. The paper first considers a theoretical framework that allows us to analyze the impact of one country's monetary policy on other economies. There are two important theoretical predictions. One is that the greater the positive impact of monetary policy easing on a country's real output, the less its beggar-thy-neighbor impact on other countries. The other is that news on future changes in monetary policy can affect exchange rates and stock prices today as financial markets are inherently forward looking. The paper then examines the impact of the US Fed's QE policy on emerging economies, including the introduction of QE, the expectation of its tapering, and the anticipation of an eventual hike in the interest rate. It also discusses the implications of "Abenomics," particularly qualitative and quantitative easing (QQE) by the Bank of Japan (BOJ), for Asian emerging economies. It finds that the impact of BOJ QQE has been positive and, in contrast to US QE1, has not created negative consequences for emerging economies. The paper finally explores policy implications for both developed and emerging economies and suggests policies to be adopted at the country, regional and global levels, emphasizing the importance of communication among central banks and with the market and the need to strengthen global financial safety nets.

JEL Classification: E52, E58, F41, F42

Contents

1.	Introduction: Impact of Monetary Policy in Developed Economies	3
2.	Monetary Policy Spillovers and Coordination: Theoretical Considerations	4
2.1	Mundell–Fleming Model and the Dornbusch Extension.....	4
2.2	New Open-Economy Macroeconomics	5
2.3	Theoretical Implications and Monetary Policy Coordination	6
3.	US Fed’s Quantitative Easing Policy, Its Unwinding, and Policy Normalization: Impact on Emerging Economies.....	7
3.1	Impact of US Quantitative Easing Monetary Policy	7
3.2	Impact of the US Fed’s Indication of QE Tapering.....	8
3.3	Quantitative Easing Unwinding and Policy Normalization.....	11
4.	Bank of Japan’s Qualitative and Quantitative Easing Policy and Its Impact on Asian Emerging Economies.....	12
4.1	BOJ’s New Monetary Policy Framework, April 2013	12
4.2	Additional Monetary Easing, October 2014	16
4.3	Fiscal Dominance and BOJ Independence	17
4.4	Impact on Emerging Asia	17
5.	Policy Implications and Scope for Policy Coordination.....	19
5.1	Challenges for the Fed and the Bank of Japan	19
5.2	Challenges and Options for Emerging Economies	21
5.3	Scope for International Policy Coordination.....	22
6.	Conclusion.....	24
	Appendix.....	26
	References	27

1. INTRODUCTION: IMPACT OF MONETARY POLICY IN DEVELOPED ECONOMIES

International monetary policy coordination issues have emerged since the culmination of the global financial crisis in 2008. Central banks in the major developed economies—the US Federal Reserve (US Fed), the European Central Bank (ECB), the Bank of England, and the Bank of Japan (BOJ)—reduced their policy rates to near zero and all of them, except the ECB, adopted unconventional monetary policy measures, called quantitative easing (QE). In particular, the US Fed resorted to several rounds of QE. The adoption of the first round (QE1) by the US Fed in March 2009 generated considerable debate about its global impact, with the then Brazilian Finance Minister Guido Mantega calling it a “currency war,” as it led to US dollar depreciation.

Soon after the BOJ introduced a New Monetary Policy Framework, called quantitative and qualitative easing (QQE), in April 2013, some Asian policymakers and academics expressed concern that the BOJ’s QQE could have negative spillover impacts through yen depreciation. According to them, yen depreciation—or appreciations of emerging Asian currencies vis-à-vis the yen—would harm their export competitiveness and growth prospects. Japan was therefore criticized for adopting a “beggar-thy-neighbor” policy.

When Ben Bernanke, the US Fed Chairman at the time, suggested a possible tapering off of QE policy in May 2013, global financial markets became volatile because of an expectation that US ultra-easy monetary policy would soon end and the US policy interest rate would start to rise. Financial markets in several major emerging economies—such as Brazil, India, Indonesia, and Turkey—experienced significant capital outflows, stock price declines, and exchange rate depreciations. Emerging economy policymakers, including Guido Mantega, blamed the US Fed for sending confusing signals over the ending of its QE policy and its low interest rate and thereby causing financial market turmoil in emerging economies.

International spillovers of monetary policy in developed economies to emerging economies led to calls for international policy coordination. The G-20 Summit in Saint Petersburg in September 2013 acknowledged that “excess volatility of financial flows and disorderly movements in exchange rates can have adverse implications for economic and financial stability” in emerging economies and announced that “future changes to monetary policy settings will continue to be carefully calibrated and clearly communicated” (Appendix). But it also agreed that “strengthened and sustained growth will be accompanied by an eventual transition toward the normalization of monetary policies.”

This paper assesses the impact of unconventional US and Japanese monetary policies on emerging economies, and explores policy coordination issues to promote macroeconomic and financial stability in developed and emerging economies. Section 2 considers a theoretical framework that allows us to analyze the impact of one country’s monetary policy on other economies. There are two important theoretical predictions. One is that the greater the positive impact of monetary policy easing on a country’s real output, the less its beggar-thy-neighbor impact on other countries. The other is that news on future changes in monetary policy can affect exchange rates and stock prices as financial markets are inherently forward-looking. Section 3 examines the impact of the US Fed’s QE policy on emerging economies, including the introduction of QE, the expectation of its tapering, and the anticipation of an eventual

hike in the interest rate. Section 4 discusses the implications of “Abenomics,” the monetary, fiscal, and structural policies pursued under Prime Minister Shinzo Abe, particularly the BOJ’s QQE, for Asian emerging economies. It finds that the impact of BOJ QQE has been positive and, in contrast to US QE1, has not created negative consequences for emerging economies. Section 5 explores policy implications for both developed and emerging economies and suggests policies to be adopted at the country, regional, and global levels, emphasizing the importance of communications among central banks and with the market and the need to strengthen global financial safety nets. Section 6 concludes the paper.

2. MONETARY POLICY SPILLOVERS AND COORDINATION: THEORETICAL CONSIDERATIONS

2.1 Mundell–Fleming Model and the Dornbusch Extension

A standard two-country Mundell–Fleming model (Mundell 1963) predicts that a home country’s monetary policy easing—typically due to an increase in money supply—has a positive impact on home output and leads to home currency depreciation. This has two offsetting impacts on the foreign country’s output, one negative through the home country’s currency depreciation (thus exerting beggar-thy-neighbor effects) and the other positive through home output expansion (thus boosting demand for foreign country exports). Theory does not predict which impact between the two will dominate. If the home-currency depreciation impact dominates then the foreign country’s output declines, while if the home-output expansion impact dominates then foreign output rises.

Monetary expansion also has impacts on home and foreign consumer prices, even though home and foreign goods and services prices are assumed to be rigid in the short run. Consumer prices are an average of each country’s domestic goods price and imported goods and services prices. Home-currency depreciation increases the home-currency price of imported goods and services and, thus, raises the home consumer price index (CPI). In the foreign country, in contrast, it decreases the foreign-currency price of imported goods and, thus reduces the CPI. This means that the real value of a consumption basket declines in the home country and rises in the foreign country for given levels of output.

So, even when home monetary expansion has a negative net (or beggar-thy-neighbor) impact on the foreign country’s output, this tends to be offset (at least partially) by a rise in real consumption in the foreign country—generated by an improvement in the foreign terms of trade. When home monetary expansion does not have a negative impact on foreign output, the foreign country clearly gains. The benefit of home monetary expansion for the home country tends to be offset (at least partially) by a decline in real consumption—generated by a deterioration in the home terms of trade.

These impacts work only in the short run where home and foreign goods and services prices are fixed. In the long run, monetary expansion raises the home goods price sufficiently to restore the same level of the real exchange rate as before monetary expansion. Real output returns to its potential level in each country. If home monetary expansion is implemented together with structural reforms to raise potential output, any possible negative impact of home monetary expansion on foreign output is likely to be offset by a permanent increase in home output.

As discussed below, Japan's "Abenomics" attempts to carry out monetary and fiscal expansion and structural reforms. Thus, any possible beggar-thy-neighbor impact from home monetary expansion on the other country's output is likely to be mitigated by higher output in Japan, including in the short term from fiscal expansion, and in the medium to long term from the impact of structural reforms.

The Dornbusch "overshooting" extension (Dornbusch 1976) of the Mundell–Fleming model provides additional insight. This model has two important theoretical implications. First, a change in monetary policy can create large fluctuations in asset prices, particularly exchange rates. For example, a home country's monetary expansion can cause the exchange rate to overshoot in the short run: the exchange rate depreciates instantly and sharply and then appreciates gradually toward a new long-run equilibrium level that is still depreciated relative to the initial level. Second, an expectation of a future monetary policy change can induce changes in asset prices today, such as exchange rates and stock prices, as financial markets are forward-looking. For example, an expectation of future monetary expansion in the home country can cause its exchange rate to depreciate instantly, even though today's monetary policy is unchanged.

Thus asset price volatility—due to overshooting and driven by expectations—reflects the inherent forward-looking nature of financial markets, which constantly re-price assets in response to new information, including expected changes in the future monetary policy stance.

2.2 New Open-Economy Macroeconomics

New open-economy macroeconomics, advanced by Obstfeld and Rogoff (1995, 2000) and Corsetti and Pesenti (2001), provides further insight into the issue of international spillovers of monetary policy. If nominal prices are rigid, the spillover mechanism is influenced by differences in the price-setting behavior of exporting firms.

First, if domestic and foreign exporting firms adopt producer currency pricing (PCP), then home currency depreciation—due to monetary expansion—does not change the home-currency price of home exports but raises the home-currency price of imports. On the other hand, it reduces the foreign-currency price of home exports (i.e., foreign imports) without changing the foreign-currency price of foreign exports. Thus home monetary expansion worsens the terms of trade in the home country and improves the terms of trade in the foreign country. Higher import prices in the home country lead to an expansion in home production of import-competing goods, thereby reducing foreign production of exports. Lower import prices in the foreign country reduce its production of import-competing goods, thereby stimulating the home production of exports.

Although home output expands and foreign output contracts, foreign consumers can enjoy a higher level of consumption because an improvement in the foreign terms of trade can offset the reduction in production (Obstfeld and Rogoff 1995; Corsetti et al. 2000). If this offsetting effect is large, home monetary expansion is unlikely to cause a beggar-thy-neighbor effect.

Second, if home and foreign exporting firms adopt local currency pricing (LCP), home-currency depreciation—due to home monetary expansion—increases the home-currency price of exports, leaving the home-currency price of imports unchanged. In the foreign country, it lowers the foreign-currency price of exports, while leaving the foreign-currency price of imports constant. Thus, home monetary expansion improves the home terms of trade and stimulates the home production of exports, while it

worsens the foreign terms of trade and reduces the foreign production of exports. As a result, home monetary expansion makes home consumers better off by both increasing home output and improving the terms of trade, while foreign consumers are made worse off. In this case home monetary expansion produces a beggar-thy-neighbor effect.

Third, the story becomes more complicated and results more uncertain if some exporting firms adopt PCP and the others LCP, and if this proportion is different between countries. In this case, whether home monetary expansion generates a beggar-thy-neighbor effect or not depends on the proportion of PCP in each country, the extent of price-setting asymmetry between countries, the size of the countries, and other structural specifications of the model. The spillover effect of home monetary expansion can have positive or negative effects on the foreign country depending on these assumptions.

2.3 Theoretical Implications and Monetary Policy Coordination

An important implication of the theoretical framework is that monetary expansion in the home country may not always exert negative spillover effects on the foreign country. Home monetary expansion usually has a positive effect on home output and an ambiguous or a negative effect on foreign output. It also tends to worsen the home terms of trade and improves the foreign terms of trade. If home monetary expansion stimulates home output sufficiently, its potentially negative impact on foreign countries can be limited and the overall impact could even turn positive. Although the case of beggar-thy-neighbor spillovers—where home monetary expansion improves the home terms of trade and worsens the foreign terms of trade—is theoretically possible, it may not be supported by empirical evidence as home currency depreciation tends to be associated with a deterioration in the home terms of trade. This weakens a case for negative spillovers.

Another implication of the theoretical model is that asset prices, such as exchange rates and stock prices, are inherently volatile because of the forward-looking nature of the financial markets. Monetary policy changes, and even expectations of future monetary policy changes, can induce large fluctuations in asset prices today.

An earlier literature on monetary policy coordination assumed that each central bank would maximize its objective function by setting its monetary policy instrument—typically, money supply—at an optimum level.¹ Without monetary policy coordination, each central bank would independently set its money supply given the other central bank's money supply, which would result in a non-cooperative (Nash) equilibrium. With monetary policy coordination, two central banks would jointly set the levels of the two money supplies, leading to a cooperative outcome. The literature argued that cooperative monetary policymaking would yield an outcome that was Pareto-superior to a non-cooperative Nash equilibrium.

This approach, although theoretically valid, encountered several problems. First, the computed benefit of policy coordination for each central bank may be small under the plausible parameter values of the model. Second, in reality central banks are often independent and accountable only to domestic constituencies, which would make it difficult for any country's central bank to make joint decisions with foreign central

¹ See, for example, Buiter and Marston (1985); Frankel and Rockett (1988); Branson, Frenkel, and Goldstein (1990); and Canzoneri and Henderson (1991).

banks. Third, this type of monetary policy coordination is not observed in the real world. Central bank policy coordination instead takes the form of information exchange, policy dialogue, concerted injection of liquidity to the markets in emergency or crisis situations, joint currency market interventions, and provisions of currency swap lines.

In recent years, the interest rate has become the more common monetary policy instrument. Many central banks in developed economies have adopted interest rate rules such as the Taylor rule, leaving the exchange rate to be determined in the market. Taylor (2013) argues that as long as central banks use similar Taylor rules under flexible exchange rates, inflation becomes low and stable, and output growth and the exchange rate also become more stable. Indeed, the great moderation period before the global financial crisis seemed to exhibit these features, and it was argued to be close to a globally optimum outcome, with relatively stable exchange rates. This implied that central banks achieved informally coordinated monetary policy regimes, without undertaking formal monetary policy coordination.

The outbreak of the global financial crisis and the adoption of unconventional monetary policy in the form of QE by major developed economies have changed this situation.

3. US FED'S QUANTITATIVE EASING POLICY, ITS UNWINDING, AND POLICY NORMALIZATION: IMPACT ON EMERGING ECONOMIES

3.1 Impact of US Quantitative Easing Monetary Policy

Soon after QE1 was introduced in March 2009, US dollar liquidity started to flow from the US to the rest of the world, particularly to emerging economies with strong growth prospects.² This resulted in US dollar depreciation and currency appreciations in several emerging economies. Some policymakers in emerging economies began to claim that the US had launched a “currency war.” For example, Brazilian Finance Minister Guido Mantega blamed the US QE1 policy and the resulting weak dollar for hurting Brazil’s export competitiveness and equated US monetary policy with a currency war.

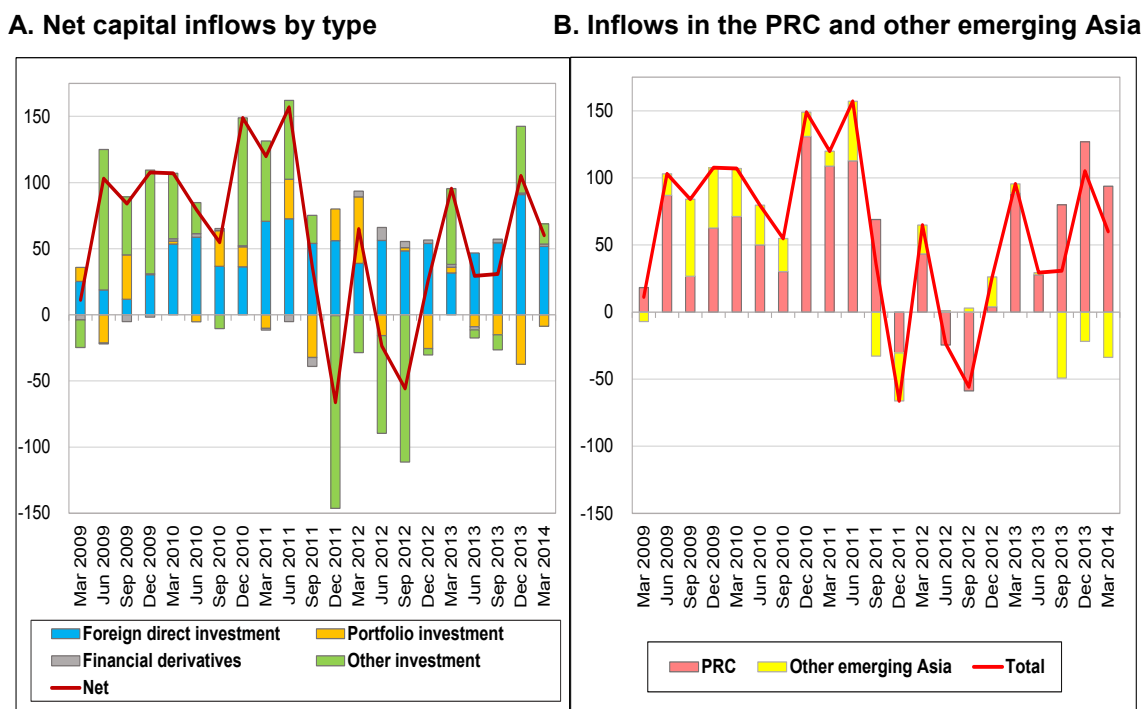
However, adopting expansionary monetary policy—including QE—is not necessarily the same as launching a currency war, even if one result is currency depreciation. A key question is its impact on economic recovery in the US—which could benefit emerging economies—and on terms of trade in emerging economies. Certainly, the Fed did not attempt to depreciate the dollar through currency market interventions, nor did it target the exchange rate for competitiveness purposes through QE.

It seems that the QE policy in the US, particularly QE1 (but not necessarily QE3), did affect emerging economy capital flows. Figure 1 shows that QE1 and QE2—together with Asia’s strong fundamentals—appear to have increased private capital inflows to Asia, although cyclical recovery in Asia probably contributed to growth of capital inflows. The period of QE3 was accompanied by net capital outflows in other emerging Asian economies (other than the PRC which continued to experience net capital

² The Fed adopted: a zero interest-rate policy in December 2008; QE1 in March 2009–March 2010; QE2 in November 2010–June 2011; and QE3 in September 2012–October 2014. However, it should be noted that the Fed has never referred to its measures as quantitative easing, preferring the expression “large-scale asset purchase program.”

inflows). The Asian Development Bank (ADB) (2013) concluded that QE1 had pronounced effects on domestic financial variables in Asian emerging economies, especially on nominal exchange rates, while QE2 and QE3 effects were relatively mild. Although there were some exceptions, QE1 generally lowered credit default swap (CDS) premia and government bond yields, and appreciated currency values.³ There is some evidence that economies that allowed their exchange rates to appreciate did not experience significant asset price rises, implying that central banks in emerging economies had to strike a balance between maintaining international price competitiveness and preventing asset price bubbles when they face large and sustained capital inflows.

Figure 1: QE and Net Capital Inflows in Emerging Asia
(\$ billion)



Source: ADB, Asian Development Outlook Update, September 2014.

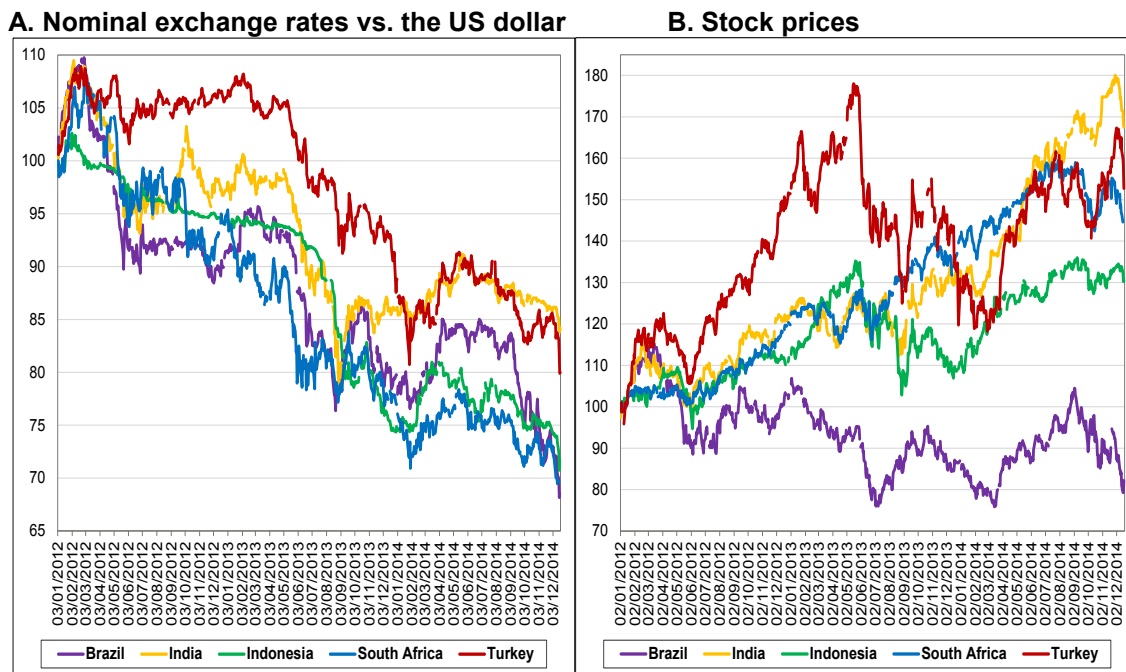
3.2 Impact of the US Fed’s Indication of QE Tapering

Former Fed Chairman Ben Bernanke indicated on 22 May 2013 a future unwinding of QE3. Financial markets, both domestic and global, reacted in a volatile way. Domestic long-term yields on Treasuries went up by around 100 basis points, and capital outflows were triggered from a group of major emerging economies—notably Brazil, India, Indonesia, South Africa, and Turkey—causing stock prices to decline and their currencies to depreciate. Several countries lost sizable amounts of foreign exchange reserves due to currency market pressures. Figure 2 shows that, between January and end-August 2013, these key emerging economies saw currency depreciations of 15%–

³ ADB (2013) found that with some exceptions, QE1 generally lowered the CDS premia on 5-year sovereign debt and the yield rates on 5-year government bonds denominated in local currency, and led to currency appreciations in emerging Asia.

20%, and some of them experienced similar declines in stock prices. It is interesting to see that some Asian currencies started to depreciate before 22 May, while stock markets—which had performed in a robust way until then—reacted sharply, showing a clear change in direction.

Figure 2: Nominal Exchange Rates and Stock Prices of Selected Emerging Economies (January 2012 = 100)

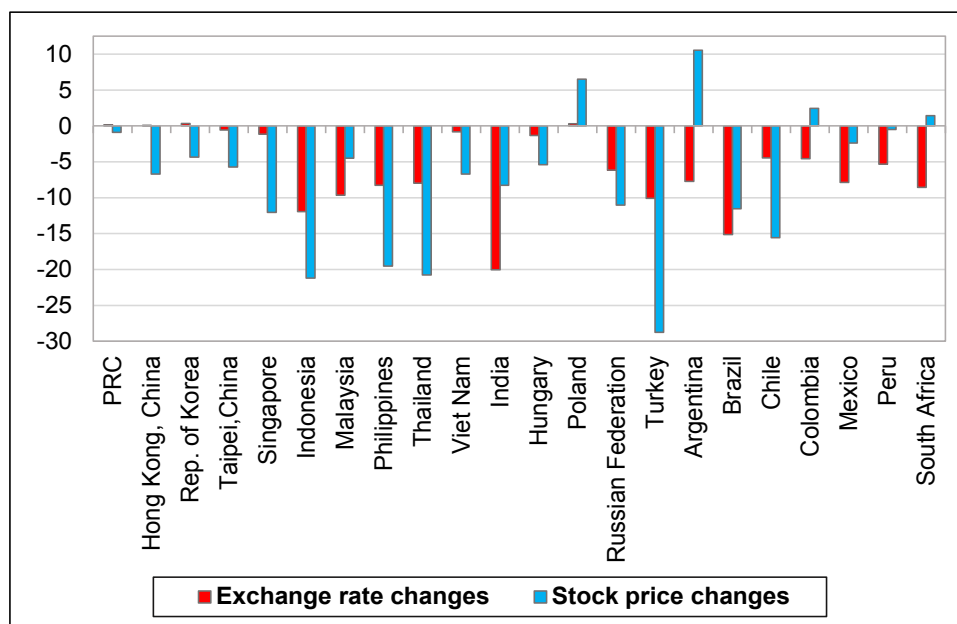


Note: An increase (decrease) in the value of the exchange rate means currency appreciation (depreciation).

Source: Bloomberg.

Figure 3 shows changes in nominal exchange rates and stock prices for 22 emerging economies between 22 May 2013 (when QE tapering was suggested) and end-August 2013. Currency values in India, Indonesia, and Turkey were hit hard, while stock prices in Turkey, Indonesia, Thailand, and the Philippines were hit most. Stock prices in Thailand and the Philippines rose up to May, but then declined rapidly afterward, with Indonesia and Turkey showing similar movements. However, other economies including the People’s Republic of China (PRC); Colombia; Hungary; Republic of Korea; Peru; Poland; and Taipei,China were not much affected.

Figure 3: Rates of Change in Nominal Exchange Rates and Stock Prices in 22 Emerging Economies (22 May 2013–29 August 2013)



PRC = People's Republic of China.

Note: An increase (decrease) in the value of the exchange rate means currency appreciation (depreciation).

Source: Bloomberg.

The contrasting performances of exchange rates and stock prices across emerging economies suggest that markets seem to have differentiated among economies depending on their macroeconomic fundamentals. The economies affected most—Brazil, India, and Indonesia—had large current account deficits, high inflation rates, and high public debt to GDP ratios. Large current account deficits and unfavorable debt conditions seem to have made these economies more susceptible to changes in market sentiments—even though these problems had been there for some time.

Table 1 reports regression results for exchange rate changes in 22 emerging economies. An increase in the left-hand side variable—exchange rate changes—indicates a currency appreciation, and a decrease a currency depreciation. Two sets of explanatory variables are used. Equation 1 uses 2012 data for the explanatory variables while Equation 2 uses 2013 projections (made in April by the IMF) for the explanatory variables. Equation 2 explains movements in exchange rates slightly better than Equation 1. Current account deficits, public debt, and inflation have statistically significant coefficients in Equation 2 with the expected signs, except for public debt whose coefficient is not statistically significant (but with the expected sign). This means that emerging economies with projected large current account deficits, high public debt, and high inflation tended to experience large currency depreciations. Other emerging economies with sound macroeconomic fundamentals have not been much affected.⁴

⁴ Similar regressions were tried for stock price changes, but no meaningful results were obtained.

Table 1: Regression Results for Exchange Rate Changes

Explanatory Variables	Equation 1	Equation 2
Constant	-2.859 (2.329)	0.066 (2.322)
Current account balance/GDP	0.589** (0.193)	0.507** (0.181)
Gross public debt/GDP	-0.084 (0.050)	-0.059 (0.045)
Inflation rate	---	-0.859** (0.350)
Number of observations	22	22
Adjusted R-squared	0.263	0.430

GDP = gross domestic product.

Note: The left-hand side variable is the exchange rate change, which is the rate of change in exchange rates between 22 May 2013 and 29 August 2013. A positive (negative) value means currency appreciation (depreciation). Equation 1 uses 2012 data for the explanatory variables, while Equation 2 uses 2013 projection data for the explanatory variables. Projections were obtained from the IMF World Economic Outlook database.

3.3 Quantitative Easing Unwinding and Policy Normalization

The Fed decided to begin tapering QE toward the end of 2013 and cautiously and gradually proceeded with QE unwinding over the next 10 months. It reduced the amount of asset purchases step by step; starting in December 2013, it cut asset purchases by \$10 billion a month at every Federal Open Market Committee (FOMC) meeting until September 2014 when it announced that asset purchases were to be reduced to \$15 billion a month in October.⁵ At the October meeting of the FOMC, the Fed finally ended the QE3 program.

The Fed took a very cautious approach to QE unwinding because it had learned lessons from its earlier QE unwinding experiences. QE1 and QE2 ended prematurely and suddenly in March 2010 and June 2011, when monthly asset purchases went from \$95 billion and \$75 billion respectively to zero overnight. These QEs ended despite the poor economic performance of the US and global economies and at a time when the US economy was not yet ready to be taken off this unconventional form of monetary policy support. By contrast, the US Fed managed the process of QE3 unwinding between September 2013 and October 2014 remarkably well, and did not generate serious market turmoil in the US or in the rest of the world.

Now that QE3 has ended, the US Fed under Janet Yellen is heading toward monetary policy normalization. Policy normalization could be achieved by reversing the QE program (i.e., selling the assets the Fed had purchased) or by raising the policy interest rate, or by combining the two. The Fed could dispose of assets in two ways: (i) by not replacing the assets as they mature, and (ii) by actively selling them back into the

⁵ The unwinding of QE3 proceeded in the following way. The FOMC meeting in December 2013 decided to reduce monthly asset purchases for January 2014 from \$85 billion to \$75 billion (from \$45 billion to \$40 billion for Treasury bonds and from \$40 billion to \$35 billion for agency mortgage-backed securities). The FOMC meetings in January, March, April, June, July, and September 2014 decided to reduce asset purchases by \$10 billion for the following month each time (and by \$5 billion each for Treasury bonds and mortgage-backed securities). The FOMC meeting in October 2014 decided to set asset purchases zero.

market. The first option seems likely to have a less disruptive impact on the market than the second. However, if the pace of the interest rate hike is faster than expected, financial market reactions may be volatile. There is a risk that fragile emerging economies will be affected, and that some of them could potentially face considerable liquidity shortage problems. The potential for financial turbulence will likely remain until the Fed raises the policy rate to a level that is consistent with stable economic growth and low inflation.

4. BANK OF JAPAN'S QUALITATIVE AND QUANTITATIVE EASING POLICY AND ITS IMPACT ON ASIAN EMERGING ECONOMIES

The Japanese government under Prime Minister Shinzo Abe that was elected in December 2012 (and re-elected in December 2014) set out a new policy package called “Abenomics.” This has three components (“arrows”): easy monetary policy, “flexible” fiscal policy, and structural reforms for growth. This may be the last chance for Japan to end long-term deflation and economic stagnation—the “lost two decades”—and restore sustained growth. Its failure could send Japan into a sovereign debt crisis, a disaster not only for Japan but also for the Asian and the world economy

The Diet appointed a new BOJ Governor, Haruhiko Kuroda, who introduced aggressive monetary policy easing of a “different dimension” in April 2013. This new monetary policy framework (quantitative and qualitative easing—QQE) was designed to create moderate and stable inflation and to support a sustained economic recovery.

4.1 BOJ's New Monetary Policy Framework, April 2013

The BOJ had long adopted a QE monetary policy with the policy interest rate at or near zero, but this policy had largely been ineffective in combating persistent deflation.⁶ The New Monetary Policy Framework, announced on 4 April 2013, was intended to make the QE policy effective and to achieve a 2% inflation target—which had been in place since January 2013—in 2 years.⁷

Table 2 shows that the BOJ planned to do this by: (i) doubling the monetary base in two years, increasing it by about ¥60 trillion–¥70 trillion a year; (ii) increasing Japanese government bond (JGB) purchases at an annual rate of about ¥50 trillion, for all maturities; and (iii) doubling purchases of exchange-traded funds (ETFs) and Japan real estate investment trusts (J-REITs), from a small base. As the new framework also intended to change the asset composition of BOJ's balance sheet and affect asset prices, it was termed a quantitative and qualitative easing (QQE) policy.

⁶ The BOJ made the following monetary policy decisions: adoption of a de facto zero interest rate policy (ZIRP) during February 1999–August 2000; adoption of ZIRP and quantitative easing (QE) policy during March 2001–March 2006 (end of ZIRP in July 2006); re-introduction of ZIRP in December 2008; return to QE policy in October 2010; introduction of quantitative and qualitative monetary easing (QQE) in April 2013; and additional monetary policy easing (dubbed as QQE2) in October 2014.

⁷ The BOJ had set an inflation “goal” of 1% in February 2012 and moved to a 2% inflation “target” to be achieved “at the earliest possible time” in January 2013.

Table 2: BOJ's Monetary Base Target and Balance Sheet Projections
(¥ trillion)

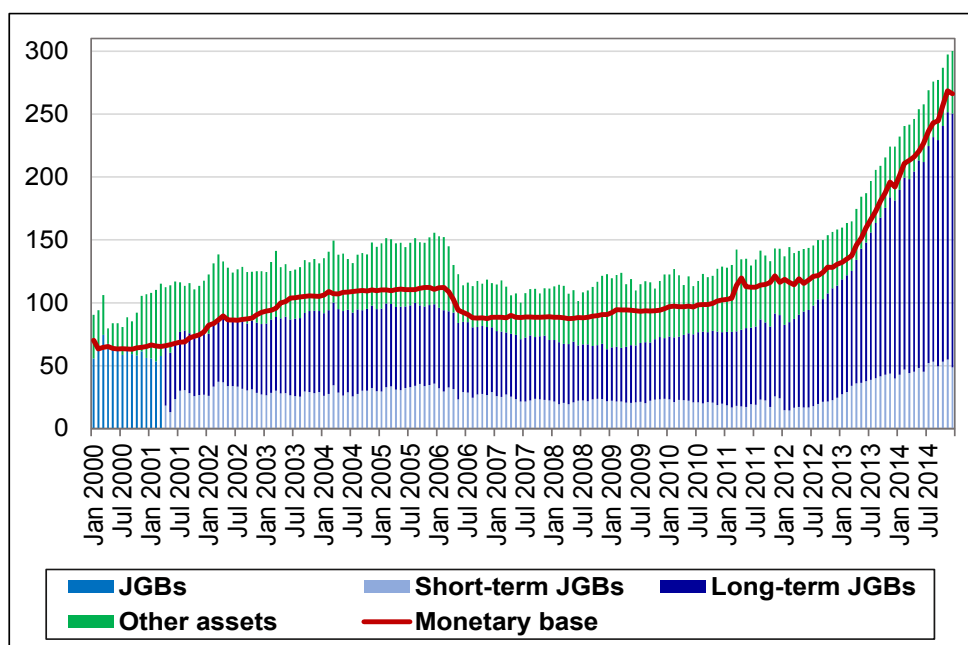
Item	End-2012 (actual)	End-2013 (projected)	End-2014 (projected)
Monetary base	138	200	270
Breakdown of the BOJ Balance Sheet			
Japanese government bonds (JGBs)	89	140	190
Commercial papers (CPs)	2.1	2.2	2.2
Corporate bonds	2.9	3.2	3.2
Exchange-traded funds (ETFs)	1.5	2.5	3.5
Japan real estate investment trusts (JREITs)	0.11	0.14	0.17
Loan Support Program	3.3	13	18
Total assets (including others)	158	220	290
Banknotes	87	88	90
Current deposits	47	107	175
Total liabilities and net assets (including others)	158	220	290

Source: Bank of Japan.

The new QQE policy was expected to have several impacts. First, goods price inflation would rise, establishing an environment for sustained growth and medium-term fiscal consolidation through nominal GDP growth. Second, equity prices would rise, stimulating consumption spending through wealth effects. Third, real long-term interest rates would decline, boosting corporate and residential investment. Fourth, nominal wages would rise, stimulating household consumption through income effects. Finally, the yen would depreciate against other currencies, expanding exports and raising import prices and thus contributing to higher inflation.

Figure 4 shows the rapid expansion of the balance sheet and the monetary base of the BOJ over time. In comparison to the previous episodes of QE undertaken by the BOJ (March 2001–March 2006 and October 2010–March 2013), the pace of expansion of the BOJ's balance sheet since May 2013 has indeed been rapid. The balance sheet expanded from ¥165 trillion in March 2013 to ¥300 trillion in December 2014 through sustained purchases of JGBs, particularly long-term JGBs. As a result, the monetary base also rose fast from ¥137 trillion to ¥266 trillion (seasonally adjusted) during the same period.

Figure 4: Assets and Monetary Base of the Bank of Japan
(¥ trillion)



JGB = Japanese government bond.

Note: The monetary base is seasonally adjusted.

Source: Bank of Japan website.

BOJ monetary policy was successful on several fronts, although its impact has yet to be fully felt throughout the entire economy.

First, CPI inflation has been persistently positive since June 2013 based on the headline or core inflation measure (or since October 2013 based on the core-core inflation measure) as shown in Figure 5. However, following a consumption tax rate hike from 5% to 8% in April 2014, the economy plunged into two consecutive quarters of negative growth, and the inflation rate began to decline in June 2014 although it was still positive.⁸

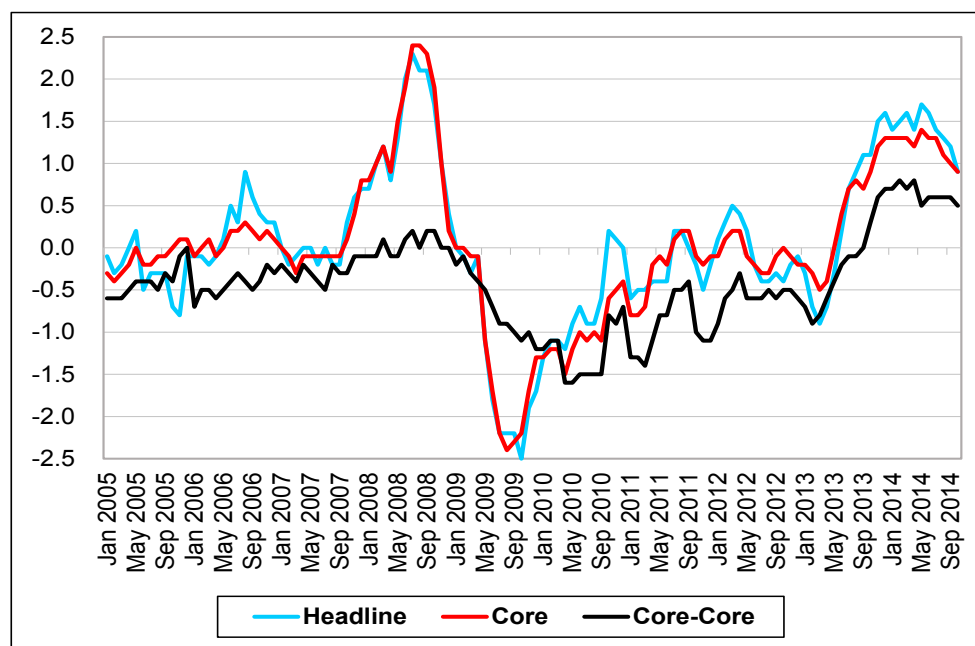
Second, equity prices have been on a rising trend and the yen kept depreciating. Equity price increases have generated large capital gains in the stock market and positive wealth effects on consumption. Yen depreciation has brought about large windfall gains for export-oriented manufacturing firms as the yen price of their exports has gone up. However, this has had a much smaller impact on export volume than anticipated.

Figure 6 shows that yen depreciation and stock price surges started soon after Abe announced his intention to implement a 2% inflation targeting policy in November 2012. Although the yen appreciated and stock prices fell in May 2013 by Bernanke’s indication of QE tapering, they subsequently recovered. The close correlation between the yen exchange rate and stock price movements (when the yen depreciates stock

⁸ The consumption tax rate hike caused a large drop in consumption, housing purchases, and corporate investment.

prices rise, and vice versa) suggests that foreign investors, particularly foreign hedge funds, have been actively involved in buying stocks and selling yen.⁹

Figure 5: Consumer Price Index (CPI) Inflation Rate
(%, year-on-year)

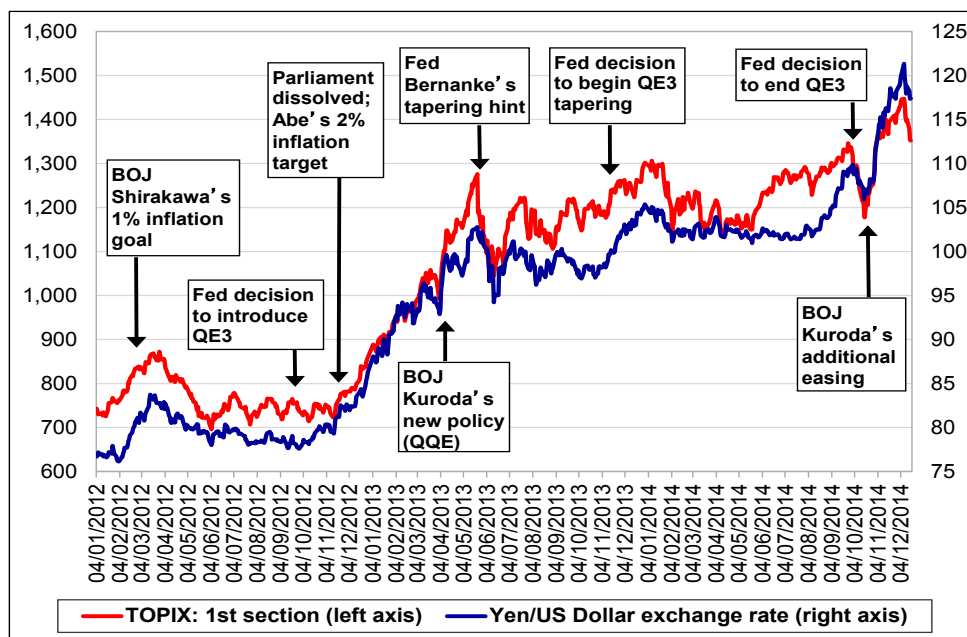


Note: Core excludes fresh food; core-core excludes food (less alcoholic beverages) and energy. Data for headline and core inflation from April 2014 have been subtracted by 2.0% to net out the effect of the consumption tax rate increase of April 2014. Data for core-core inflation for April 2014 and May-October 2014 have been subtracted by 1.5% and 1.7%, respectively, to adjust for the effect of the consumption tax rate increase.

Source: Statistics Japan, website.

⁹ As a result, the share of foreign investors' exposure to Japanese stocks, in US dollar terms, in their total portfolios does not seem to have risen much.

Figure 6: Yen Depreciation and Stock Price Surge



BOJ = Bank of Japan, QE = quantitative easing, QQE = quantitative and qualitative easing.

Note: An increase (decrease) in the yen exchange rate in this figure means yen depreciation (appreciation).

Source: Bloomberg.

Third, the real long-term interest rate has declined as expected, but this has not stimulated investment as much as expected. Japan has yet to see the large manufacturing firms which have benefited from yen depreciation investing in capacity and equipment, expanding output, raising nominal wages substantially, and paying higher prices for intermediate inputs procured from their supplier firms which often need to import industrial and other materials from abroad.

Nominal wages have not risen as much as consumer prices, so real wages have fallen. Thus households whose primary income sources are wages have likely suffered so far. However, as the unemployment rate has continued to decline and the labor market has tightened, pressures are likely to mount on corporations to raise nominal wage rates.

4.2 Additional Monetary Easing, October 2014

As the CPI inflation rate fell back and the risk of not achieving 2% inflation in 2015 increased, the BOJ decided to ease monetary policy further at the end of October 2014. One factor behind the BOJ's decision was the decline in oil prices as this would have a negative impact on the CPI in the short run, although it could have positive impacts on the economy and eventually the CPI in the medium run (Kuroda 2014).

Additional measures included: a further increase in the monetary base; a further expansion of long-term JGB purchases and lengthening of their maturities; and a tripling of purchases of ETF and J-REIT.¹⁰

¹⁰ The monetary base would rise to ¥80 trillion (an increase of ¥10 trillion—¥20 trillion) per year; purchases of long-term JGBs would increase at annual rate of about ¥80 trillion (an increase of ¥30 trillion) and the average maturities of long-term JGBs would be lengthened to 7–10 years (an increase of a maximum 3

Following this additional monetary policy easing, the yen has further depreciated and stock prices have continued to rise. In addition, the BOJ's move has had a positive impact on global stock markets, including those in emerging economies, particularly in Asia. At the time of the US Fed's unwinding of QE3 and heading toward policy normalization, Japan's additional monetary easing has had an offsetting effect.

4.3 Fiscal Dominance and BOJ Independence

Given Japan's large fiscal deficits, the BOJ's massive purchases of long-term JGBs could be interpreted as central bank financing of the deficits, even though its asset purchases are an instrument to achieve the target inflation rate of 2%. The appearance of deficit financing might undermine the BOJ's credibility and reputation of independence. As a result, it could face difficulties in containing inflation in future when deflation is no longer the major issue and inflation becomes the most pressing monetary policy challenge.

It is thus essential for the government to embark on a solid fiscal consolidation program, thereby alleviating the appearance of fiscal dominance pressures on the BOJ. From this perspective, it should be noted that the government and the BOJ jointly issued a "Joint Statement on Overcoming Deflation and Achieving Sustainable Economic Growth" (22 January 2013). Its objective was to strengthen policy coordination to overcome deflation and achieve sustainable economic growth. The statement clearly said that the BOJ would "set(s) the price stability target at 2 percent in terms of the ... consumer price index," while the government would "steadily promote measures aimed at establishing a sustainable fiscal structure."

Unless the government starts implementing a fiscal consolidation program, the BOJ may face the uncomfortable situation of rising risk premia on long-term JGB interest rates.¹¹ Without economic growth, high and rising risk premia on JGBs would further exacerbate pressures on public finances by increasing the government's debt servicing costs and further raise government debt levels. This could lead to a sovereign debt crisis, and in turn would damage the health of the banking system, which has large holdings of JGBs. In the worst case, a vicious circle between a sovereign debt crisis and a banking crisis could set in, as was observed in the eurozone in 2010–2013.

4.4 Impact on Emerging Asia

Some policymakers in emerging Asia have expressed concern that the BOJ's QQE policy may have negative spillover impacts through yen depreciation. The BOJ's monetary policy easing focuses on domestic objectives—targeting a higher inflation rate of 2% and stable output growth—and the BOJ has no intention of achieving growth at the expense of neighboring economies in Asia. Since the adoption of the New Monetary Policy Framework, the BOJ has not directly intervened in the foreign

years); and purchases of ETF and J-REIT would increase at annual rates of ¥3 trillion and ¥90 billion, respectively.

¹¹ This suggests that Japan's short-term fiscal stimulus (the second arrow of Abenomics) needs to be made consistent with medium-term fiscal consolidation efforts to achieve debt sustainability. This is a challenge as Prime Minister Abe has decided to postpone the timing of the next consumption tax rate hike (from 8% to 10%) until April 2017. It is important that the government commits to a credible fiscal consolidation program by raising the consumption tax rate by 2017 (and possibly to the 15%–20% range in future) and containing old-age-related social security spending. In this way, the market could maintain confidence in the solvency of JGBs even if a temporary fiscal stimulus were to be adopted.

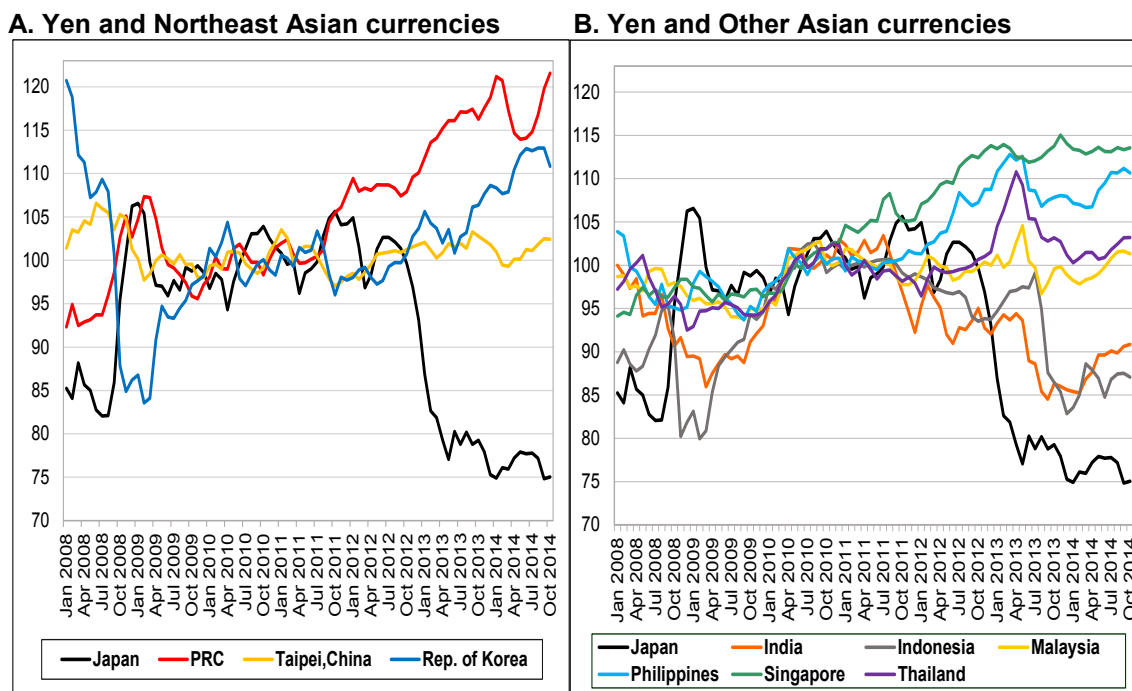
exchange market to weaken the yen. Nonetheless, yen depreciation is one of the important channels for ending deflation, supporting growth, and providing an environment for domestic economic recovery.

McKinnon and Liu (2013) provide econometric evidence that shows that Japan's economic growth has a positive impact on growth in many emerging Asian economies, while yen depreciation negatively affects their growth.¹² This is consistent with the theoretical framework discussed in Section 2. In reality, however, yen depreciation has not stimulated Japan's real export nor reduced its trade deficits that emerged in the wake of the Great East Japan Earthquake of March 2011, at least so far. That is, even though the BOJ's QE has resulted in yen depreciation, there is not much evidence that 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. Structural reforms for growth (the third arrow) would also boost long-term growth in Japan and therefore have positive spillover effects on Asia's emerging economies.

Figure 7 shows the real effective exchange rates of Japan and emerging Asian economies. The yen has depreciated on a real effective basis by more than 20% since mid-2012. The large real effective depreciation of the yen represents a correction of the previous significant overvaluation. The renminbi (RMB) appreciated substantially on a real effective basis, followed by the Korean won, the Singapore dollar and the Philippines peso. Other currencies have not appreciated much as the initial appreciations—partly driven by yen depreciation—have been reversed by the QE tapering suggestion made in May 2013. The substantial RMB or won appreciation should not cause a significant problem for the PRC or the Republic of Korea as it reduces the local costs of parts and components imported from Japan, which are needed for the production of final products to be exported. Indeed the PRC's and the Republic of Korea's trade balances continue to register surpluses. Currency appreciations in Singapore and the Philippines (the latter partly driven by large inflows of remittances) would not make these countries less competitive vis-à-vis Japan as their exports do not compete against Japanese products.

¹² According to McKinnon and Liu (2013), an increase in Japan's growth rate by 1% point would stimulate growth in emerging East Asian economies by 0.6%, and yen depreciation by 1% would reduce their growth by 0.1%.

Figure 7: Real Effective Exchange Rates of the Yen and Emerging Asian Currencies January 2008–October 2014 (2010 = 100)



Note: Real effective exchange rates are defined by CPIs. An increase (decrease) means currency appreciation (depreciation).

Source: Bank for International Settlements.

A more serious challenge for Asian emerging economies than the BOJ’s QQE is to cope with the US Fed’s normalization of monetary policy, which could lead to capital outflows, stock price declines, exchange rate depreciations, and possibly liquidity shortages. From this perspective, Japan’s QQE has had a stabilizing impact on those Asian emerging economies which face capital outflow challenges. In other words, the potential negative impact of the US Fed’s policy normalization on Asian emerging economies could be offset at least partially by the BOJ’s QQE.

5. POLICY IMPLICATIONS AND SCOPE FOR POLICY COORDINATION

5.1 Challenges for the Fed and the Bank of Japan

The Fed: Cautious Normalization of Monetary Policy

US monetary policy changes have clearly and significantly affected other countries, including emerging economies. Indeed, the introduction and successive strengthening of the Fed’s QE and the tapering of QE exerted symmetrical spillover effects on several emerging economies. The implementation of QE1 in March 2009 generated capital inflows, stock price surges, and currency appreciations in many emerging economies, while the tapering suggestion of QE3 in May 2013 generated large capital outflows, stock price declines, and currency depreciations in some fragile emerging economies with weak macroeconomic fundamentals. In hindsight, they were fortunate not to have experienced liquidity or currency crises. Thus, the same emerging economies naturally

criticized both the adoption of QE as a currency war,¹³ and the tapering of QE as a potential trigger of liquidity shortages and financial crises.

In the same way as US monetary policy changes can have significant impacts on emerging economies globally, emerging economy growth prospects can also affect US economic performance.¹⁴ It is therefore in the interest of the Fed to take international spillovers into account when making policy changes. The Fed indeed took a cautious approach to ending QE3 between September 2013 and October 2014. The Fed under Janet Yellen needs to continue to take a cautious approach to monetary policy normalization (particularly its first interest rate hike), while clarifying the conditions, speed, and timeframe of policy normalization and intensively communicating with markets and emerging economy policymakers. Reducing policy uncertainty should contribute to financial market stability. Following the relatively smooth experience of QE3 unwinding, if in the process of the interest rate hike the Fed encounters financial turbulence in the US and the rest of the world, it would be advised to slow the process and thereby minimize potential negative spillovers.¹⁵

Bank of Japan: Support for Sustained Economic Growth

The BOJ's QQE program focuses on domestic objectives, i.e., targeting a higher inflation rate of 2% and supporting stable output growth. Although some policymakers in emerging Asia have expressed concern that QQE would exert a negative spillover impact on Asian emerging economies, the evidence so far does not support such concern. In other words, the BOJ's QQE has likely had a smaller impact on emerging economies than did the Fed's QE.¹⁶ In addition, Japan's output expansion—through fiscal stimulus in the short term and structural reforms in the medium term—would offset any potentially adverse impact of QQE.

The role of government is essential in implementing the growth strategy (the third arrow of Abenomics), i.e., carrying out structural reforms in the health, labor, energy and agricultural sectors and enabling fiscal consolidation by raising the consumption tax rate and reforming the social security system. The BOJ's policy attempts to create a conducive environment for such policies.

¹³ Use of QE should not be equated with a currency war, even if it leads to US dollar depreciation in practice. The term "currency war" would be more appropriate when a central bank intervenes in the foreign exchange market to push down the exchange rate to an undervalued level, which the Fed did not do.

¹⁴ As the total size of emerging and developing economies (with their collective GDP being \$30.5 trillion at current prices and exchange rates in 2014) has become much larger than that of the US economy (\$17.4 trillion), the state of the US economy is significantly affected by the state of emerging and developing economies.

¹⁵ Recognizing this problem, Fischer (2014) provides the Fed's position that "as part of our efforts to achieve our congressionally mandated objective of maximum sustainable employment and price stability, the Federal Reserve will also seek to minimize adverse spillovers and maximize the beneficial effect of the U.S. economy on the global economy."

¹⁶ There are several reasons for US monetary policy to have a greater impact on the rest of the world than Japanese monetary policy. The scale of the US economy is larger than the Japanese economy (with its GDP being \$4.8 trillion in 2014), the size of financial markets based on the US dollar tends to be much larger than that based on the yen, and the dollar is the leading global currency for international trade, investment and financial transactions .

5.2 Challenges and Options for Emerging Economies

Emerging economies can adopt a wide variety of policies when they face large capital inflows or outflows (Box 1). A textbook view on policy responses to large capital inflows and outflows would be for economies to adopt a corner solution of fully flexible exchange rates, capital account openness (no capital controls), and low-inflation monetary policy. Fully flexible exchange rates are appropriate for developed economies with deep, liquid, and broad financial markets. However, full flexibility for emerging economies could be counterproductive. For example, the scale of currency depreciations observed in key emerging economies (such as Brazil, India, Indonesia, and Turkey) during May–August 2013 was clearly excessive, and their repeat needs to be avoided. Emerging economies lack depth in their foreign exchange markets, risk tolerance, and industrial diversification and therefore are not able to cope with wide exchange rate swings. Their shallow financial markets and systems are not resilient enough to withstand capital flow volatility.

Box 1: A Framework for Managing Capital Flows

Macroeconomic policy measures

- Allow exchange rate adjustment
- Sterilize foreign exchange market intervention
- Use monetary policy
- Use fiscal policy

Macroprudential policy measures

- Tighten macroprudential supervision and regulation of domestic markets
- Control short-term capital inflows or outflows

Structural policy measures

- Develop and deepen financial markets
- Allow more capital flows, inward and outward, depending on the situation
- Pursue reforms to fiscal policy, trade, foreign direct investment (FDI), and infrastructure

Source: Kawai and Lamberte (2010).

Emerging economies need to use a combination of macroeconomic and macroprudential policies, including capital flow management measures—to prevent asset price booms and busts, while guarding against the effects of excessive capital flow volatility—as well as structural policies. To prepare for possible liquidity shortages or currency crises, they need to build up foreign exchange reserves, conclude bilateral currency swap agreements with reserve currency countries, and participate in regional and global financial safety nets.

Following the indication of US QE tapering, emerging economies with weak macroeconomic fundamentals—large current account deficits, high public debt, and high inflation—experienced large currency depreciations. However, other emerging economies with sound macroeconomic fundamentals were not much affected. This suggests that emerging economies must pursue structural reforms—alleviating

constraints to long-term growth, improving competitiveness, investing in infrastructure, enhancing business climates, and opening the economy to FDI and services trade—and reduce deficits in the budget and the external current account. Implementation of such reforms would send positive signals to the global financial market (Box 2).

Box 2: Examples of Macroeconomic and Structural Policy Needs:

India and Indonesia

India:

- Support the currency: The authorities have raised the interest rate, encouraged inward investment, and introduced controls on outward capital transfers by Indian companies and citizens.
- Contain inflation: The authorities need to consolidate fiscal positions by reducing general subsidies and containing spending.
- Boost market confidence: The authorities need to pursue structural reforms to expedite large infrastructure projects that are already delayed; reduce impediments to inward FDI; deregulate the services sector; and alleviate other constraints to long-term growth.

Indonesia:

- Reduce the immediate pressures in the financial and currency markets: Indonesian policymakers have raised the policy rate several times and announced a package of measures in August 2013 to manage the widening current account deficit, deal with inflationary pressures, and boost investment.
- Contain rising current account deficits: The authorities may allow greater exchange rate flexibility (to guide rupiah depreciation) but this needs to be balanced against its negative impact on inflation, fiscal positions, and corporate foreign liabilities.
- Boost market confidence: The authorities must strengthen structural reforms to encourage FDI; diversify the economy and make exports less dependent on commodities; address infrastructure gaps; reduce the cost of doing business; and alleviate other constraints to long-term growth.

5.3 Scope for International Policy Coordination

Global Policy Coordination

The US Fed's policy action significantly affects a large number of economies globally. However, the rest of the world, even emerging economies, can also have an impact on the US economy. This suggests that, ideally, the Fed should run monetary policy from a global perspective (by taking into account its policy impact on the rest of the world and repercussions back to the US), not simply from a domestic perspective. But this is politically difficult in the US.

Joint decision making in the formulation of monetary policy by the US Fed with other central banks would be even more difficult. So the most realistic strategy would be for the Fed to achieve policy normalization and then run monetary policy using a stable rule, such as a Taylor rule. This would create a world economy where independent

monetary policy decisions would lead to an outcome close to a cooperative outcome. However, the transition to normality needs to be managed well.

Several emerging economies—such as Brazil, India, and Indonesia—complained that QE tapering was causing capital outflows, stock price declines, and currency depreciations.¹⁷ For example, in the face of currency market pressures, Brazil's Mantega once again blamed the US Fed for sending confusing signals over the end to QE3. Following apparently heated discussions at the G20 Summit Meeting in Saint Petersburg, the Fed began to taper QE3 gradually and step by step and intensified communications with the market. In this respect, the G20 Summit Meeting seems to have worked well as a forum for policy dialogue, information exchange, and peer pressure.

Indeed, the G20 policy dialogue process is healthy as policymakers can discuss policy spillover issues frankly. G20 leaders agreed to avoid competitive depreciations and protectionism in Saint Petersburg. But what is lacking is a solid set of global financial safety nets (see Fernandez-Arias and Levy-Yeyati [2010] and Pickford [2011]).

Global financial safety nets are important to contain large currency depreciations, such as those observed during May–August 2013. For example, it would be very helpful if the US Fed could extend currency swap arrangements to key emerging economies, just as it extended them to Brazil, Republic of Korea, Mexico, and Singapore in the aftermath of the Lehman shock. Other reserve currency central banks (the ECB, the Bank of England, and the BOJ) may follow suit. A new Contingent Reserve Arrangement proposed by the BRICS would also be useful if managed well.¹⁸ Regional financial safety nets as well as IMF precautionary facilities both need to be strengthened.

Regional Financial and Monetary Cooperation in Asia

Asia has ample room to improve regional financial and monetary cooperation. First, policy dialogue and information exchange processes, facilitated by the ASEAN+3 Macroeconomic Research Office (AMRO) may be strengthened so they can promote regional macroeconomic and financial stability. Second, if economies in the region encounter common capital inflow or outflow pressures, they could coordinate in implementing capital inflow or outflow controls to minimize any spillover impacts. Third, informal exchange rate policy coordination for collective currency adjustment would help to achieve each country's macroeconomic and financial sector stability while maintaining intraregional exchange rate stability.

Regional financial safety nets can be bolstered. The Chiang Mai Initiative Multilateralization (CMIM) could be expanded, formally delinked from IMF programs, and its membership extended to include all ASEAN+6 countries, adding India, Australia, and New Zealand. The IMF and regional institutions (AMRO and CMIM) could increase their collaboration as even emerging Asia will need the IMF in the case of large-scale or multi-country currency and financial crises. The IMF and Asia's regional institutions can analyze any international spillover effects together and provide consistent advice to Asian emerging economy policymakers.

¹⁷ Brazil had also complained about currency appreciation pressures under QE1.

¹⁸ The BRICS countries—Brazil, the Russian Federation, India, the PRC, and South Africa—agreed, in their 6th Summit Meeting in July 2014, to establish a Contingent Reserve Arrangement with the total amount of contribution of \$100 billion.

Japan already has several bilateral currency swaps (Table 3) and these could be expanded to other countries in the region. In January 2014, the governments of Japan and India expanded their bilateral currency swap arrangement from \$15 billion to \$50 billion. The PRC's bilateral currency swaps are designed to promote RMB-based trade, but they could be made available in US dollars in the event of acute liquidity shortages on the part of counterpart countries.

Table 3: Japan's Bilateral Currency Swap Arrangements (as of November 2014)

Country	Contracting Agency	Currency Used	Swap Commitment
Republic of Korea ^a	JMOF and BOK	US dollar vs. domestic currency	Japan to Republic of Korea, \$10 billion; Republic of Korea to Japan, \$5 billion
Indonesia ^a	JMOF and BI	US dollar vs. rupiah	Japan to Indonesia, \$22.76 billion
Philippines ^a	JMOF and BSP	US dollar vs. domestic currency	Japan to the Philippines, \$6 billion; Philippines to Japan, \$0.5 billion
India ^b	JMOF and RBI	US dollar vs. domestic currency	Japan to India, \$50 billion; India to Japan, \$50 billion
PRC	BOJ and PBOC	Yen vs. RMB	Japan to PRC, \$3 billion equivalent; PRC to Japan \$3 billion equivalent

JMOF = Japanese Ministry of Finance; BOK = Bank of Korea; BI = Bank Indonesia; BSP = Bangko Sentral ng Pilipinas; RBI = Reserve Bank of India; PBOC = People's Bank of China; PRC = People's Republic of China.

Notes: ^a The bilateral swap arrangements with the Republic of Korea, Indonesia, and the Philippines complement the Chiang Mai Initiative, and will require IMF programs if more than 20% of the commitment is to be withdrawn.

^b The bilateral swap arrangement with India is subject to the same IMF-link.

Source: Ministry of Finance, Government of Japan.

6. CONCLUSION

The US monetary policy experience since the Lehman collapse suggests that QE, an emergency measure adopted in extraordinary conditions, worked well for the US economy. While the economy has not fully recovered, US economic growth has picked up, bank loans have expanded, business investment has risen, unemployment has fallen, and consumer spending has grown. QE was successful in providing liquidity to the market, lowering the real interest rate, and boosting stock prices.

This paper has argued that US monetary policy has had significant global spillover effects, particularly on emerging economies. Several emerging economy policymakers complained about the introduction of QE as a currency war and about the suggested tapering of QE as leading to capital outflows. The presence of economic interdependence between the US and the rest of the world suggests that, in changing its monetary policy stance, the Fed needs to pay attention to spillovers to the rest of the world as these could in turn impact back on the US. Now that QE has ended, the US Fed would be well-advised to take a cautious approach to further steps toward monetary policy normalization (through interest rate hikes, or asset sales, or both), while clarifying the conditions, speed and timeframe of policy normalization and communicating with the market effectively. By restoring a Taylor rule, the Fed can set the stage to achieve a globally desirable outcome akin to that of a cooperative solution.

The paper has also argued the positive spillovers on Asian emerging economies of the BOJ's recent monetary policy changes. Further implementation of Japan's growth strategy—the third arrow of Abenomics—and the consolidation of public finance and debt are critical to both Japan and the rest of the world. The success of Abenomics

would be good for Japan, Asia, and the world, while its failure could send Japan into a sovereign debt crisis, which would be very detrimental to Japan and the rest of the world.

One of the most significant challenges for emerging economies will be to cope with the US Fed's continuing move toward monetary policy normalization, which may create capital outflows, stock price declines, and exchange rate depreciations in these economies, possibly leading to liquidity shortages and even currency crises.

In this context, the paper has shown that the emerging economies that tend to experience large currency depreciations are those with large current account deficits, high public debt, and high inflation. Economies with sound macroeconomic fundamentals are usually little affected. This suggests that it is in the interest of emerging economies to pursue structural reforms (alleviating constraints to long-term growth, improving competitiveness, investing in infrastructure, enhancing business climates, and opening the economy to FDI and services trade) and to reduce large deficits in the budget and the external current account. Implementation of such reforms would send positive signals to the global financial markets.

The international community needs to strengthen global financial safety nets to prevent liquidity shortages in emerging economies from developing into a serious crisis. The US Fed should forge bilateral currency swaps with major emerging economies, as was done in the aftermath of the Lehman shock with Brazil, the Republic of Korea, Mexico, and Singapore. Japan has already been putting in place bilateral currency swap arrangements with several emerging Asian economies. Regional financial safety nets, such as the Chiang Mai Initiative in Asia, can be scaled up and made more useful for emerging economies. Finally, there is scope for the IMF to work with regional institutions to respond to possible emerging economy turmoil in the process of US monetary policy normalization.

APPENDIX

Selections from the G20 Leaders' Declaration, Saint Petersburg Summit, September 2013

- Our immediate focus is on creating the conditions to increase growth and employment with timely actions that build on the signs of a recovery in advanced economies to make it durable to the benefit of the whole global economy.
- Monetary policy will continue to be directed towards domestic price stability and supporting the economic recovery according to the respective mandates of central banks. We recognize the support that has been provided to the global economy in recent years from accommodative monetary policies, including unconventional monetary policies. We remain mindful of the risks and unintended negative side effects of extended periods of monetary easing. We recognize that strengthened and sustained growth will be accompanied by an eventual transition toward the normalization of monetary policies. Our central banks have committed that future changes to monetary policy settings will continue to be carefully calibrated and clearly communicated.
- We reiterate that excess volatility of financial flows and disorderly movements in exchange rates can have adverse implications for economic and financial stability, as observed recently in some emerging markets. Generally stronger policy frameworks in these countries allow them to better deal with these challenges. Sound macroeconomic policies, structural reforms and strong prudential frameworks will help address an increase in volatility. We will continue to monitor financial market conditions carefully.
- We commit to cooperate to ensure that policies implemented to support domestic growth also support global growth and financial stability and to manage their spillovers on other countries.
- We reiterate our commitments to move more rapidly toward more market-determined exchange rate systems and exchange rate flexibility to reflect underlying fundamentals, and avoid persistent exchange rate misalignments. We will refrain from competitive devaluation and will not target our exchange rates for competitive purposes. We will resist all forms of protectionism and keep our markets open.

Note: Emphasis added by the author.

Source: G20 Leaders' Declaration, Saint Petersburg Summit (5–6 September 2013).

REFERENCES

- Bernanke, Ben S. 2013. Monetary Policy and the Global Economy. Remarks (25 March) at a Public Discussion in Association with the Bank of England, Department of Economics and STICERD (Suntory and Toyota International Centres for Economics and Related Disciplines), London School of Economics, London.
- Branson, William H., Jacob A. Frenkel, and Morris Goldstein, eds. 1990. *International Policy Coordination and Exchange Rate Fluctuations*. Chicago: University of Chicago Press.
- Buiter, Willem H. and Richard C. Marston, eds. 1985. *International Economic Policy Coordination*. Cambridge: Cambridge University Press.
- Canzoneri, Matthew B. and Dale W. Henderson. 1991. *Monetary Policy in Interdependent Economies*. Cambridge, MA: MIT Press.
- Caruana, Jaime. 2012. International Monetary Policy Interactions: Challenges and Prospects. Paper presented to the CEMLA-SEACEN Conference, The Role of Central Banks in Macroeconomic and Financial Stability: The Challenges in an Uncertain and Volatile World (16 November), Punta del Este, Uruguay.
- Chen, Qianying, Andrew Filardo, Dong He, and Feng Zhu. 2012. International Spillovers of Central Bank Balance Sheet Policies. *BIS Papers* No 66, Bank for International Settlements, Basel.
- Corsetti, Giancarlo and Paolo Pesenti. 2001. Welfare and Macroeconomic Interdependence. *Quarterly Journal of Economics* 116: 421–446.
- Dornbusch, Rudiger. 1976. Expectations and Exchange Rate Dynamics. *Journal of Political Economy* 84(6): 1161–1176.
- Eichengreen, Barry. 2013. Currency War or International Policy Coordination? Processed (January), Department of Economics, University of California.
- Eichengreen, Barry and Jeffrey Sachs. 1985. Exchange Rates and Economic Recovery in the 1930s. *Journal of Economic History* 45(4) (December): 925–946.
- Fischer, Stanley. 2014. The Federal Reserve and the Global Economy. Per Jacobsson Foundation Lecture (11 October). 2014 Annual Meetings of the International Monetary Fund and the World Bank Group, Washington, DC.
- Fernandez-Arias and Eduardo Levy-Yeyati. 2010. Global Financial Safety Nets: Where Do We Go from Here? IDB Working Paper Series No. IDB-WP-231 (November). Washington, DC: Inter-American Development Bank.
- Frankel, Jeffrey A. and Katharine E. Rockett. 1988. International Macroeconomic Policy Coordination When Policymakers Do Not Agree on the True Model. *American Economic Review* 78 (June): 318–340.
- Fratzscher, Marcel, Marco Lo Duca, and Roland Straub. 2012. A Global Monetary Tsunami? On the spillovers of US Quantitative Easing. Processed (October), Frankfurt: European Central Bank.
- Frieden, Jeffrey and J. Lawrence Broz. The Political Economy of International Monetary Policy Coordination. Processed.

- Fukuda, Shin-ichi. 2013. "Abenomics: Why Was It so Successful in Changing Market Expectations?" Processed (August), University of Tokyo.
- Haberis, Alex and Anna Lipinska. 2012. International Policy Spillovers at the Zero Lower Bound. Finance and Economics Discussion Series, 2012-23 (April 5), Divisions of Research & Statistics and Monetary Affairs, Federal Reserve Board, Washington, DC.
- International Monetary Fund (IMF). 2012. *2012 Spillover Report*. Washington, DC: IMF.
- Ito, Takatoshi. 2013. War and Peace among Currencies: Spillover of Monetary Policy in the Age of Quantitative Easing. Paper for International Conference (May), Cabinet Office, Government of Japan, Tokyo.
- Iwata, Kazumasa and Shinji Takenaka. 2012. Central Bank Balance Sheet Expansion: Japan's Experience. *BIS Papers* No. 66, Bank for International Settlements, Basel.
- Kawai, Masahiro and Mario Lamberte, eds. 2010. *Managing Capital Flows: Search for a Framework*. Cheltenham, United Kingdom: Edward Elgar.
- Kuroda, Haruhiko. 2014. Welcome to the "2 Percent" Club. Speech at the Meeting of Councillors of Nippon Keidanren (Japan Business Federation) (25 December), Tokyo.
- McKinnon Ronald and Zhao Liu. 2013. Modern Currency Wars: The United States versus Japan. ADBI Working Paper No. 437 (October). Tokyo: Asian Development Bank Institute.
- Morgan, Peter. 2011. Impact of US Quantitative Easing Policy on Emerging Asia. ADBI Working Paper No. 321 (November). Tokyo: Asian Development Bank Institute.
- Mundell, Robert A. 1963. Capital Mobility and Stabilization Policy under Fixed and Flexible Exchange Rates. *Canadian Journal of Economics and Political Science* 29(4): 475–485.
- Neely, C. J. 2010. The Large Scale Asset Purchase Had Large International Effects. Working Paper Series No. 2010–018D. Missouri: Federal Reserve Bank of St. Louis.
- Obstfeld, Maurice and Kenneth Rogoff. 1995. Exchange Rate Dynamics Redux. *Journal of Political Economy* 102: 624–660.
- Obstfeld, Maurice and Kenneth Rogoff. 2000. New Directions for Stochastic Open Economy Models. *Journal of International Economics* 50: 117–153.
- Obstfeld, Maurice and Kenneth Rogoff. 2002. Global Implications of Self-Oriented National Monetary Rules. *Quarterly Journal of Economics* 117(2) (May): 503–535.
- Pickford, Stephen. 2011. Global Financial Safety Nets. Chatham House Briefing Paper, IE BP 2011/02 (October). London: Chatham House.
- Taylor, John B. 2013a. International Monetary Coordination and the Great Deviation. A paper prepared for an American Economic Association Annual Meetings session, International Policy Coordination (January).
- Taylor, John B. 2013b. International Monetary Policy Coordination: Past, Present and Future. Paper prepared for the 12th BIS Annual Conference, Navigating the

Great Recession: What Role for Monetary Policy? (21 June), Lucerne, Switzerland.

Yellen, Janet L. 2012. Revolution and Evolution in Central Bank Communication. Remarks (13 November) at Haas School of Business, University of California.