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The Federal Reserve and the Global Economy

Remarks by

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at

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I am happy to be here today, and I thank the organizers for inviting me.¹ It is a particular pleasure to be back in Israel, where my career as a central banker began. At the Fed, I face a somewhat different set of responsibilities, and my lecture today is on the special challenges that face the Federal Reserve and the global economy in an increasingly interconnected world.²

Over the past 50 years, global trade has more than tripled relative to world gross domestic product (GDP), and the ratio of total exports to global GDP now stands at about 30 percent--though, interestingly, the rate of growth of global international trade has declined to the level of the growth rate of world GDP since the start of the Great Recession. International trade has not loomed as large in the U.S. national accounts as it has for many other countries, but it is an increasingly important driver of the U.S. economy, with the share of trade in U.S. GDP currently at about 15 percent.

Although the U.S. share of world GDP has gradually declined since the mid-20th century, the broader importance of the United States to the global economy has diminished less, as a result of increasing financial linkages. In particular, U.S. residents' ownership of private foreign assets has risen from 6.5 percent of U.S. annual GDP in 1950 to more than 140 percent of annual U.S. GDP (nearly \$25 trillion), reflecting the leading role of U.S. capital markets in cross-border finance. Total foreign investment in the United States is even larger, at more than \$30 trillion.

¹ I am grateful to John Ammer, Christopher Erceg, Joseph Gruber, and Beth Anne Wilson of the Federal Reserve Board's staff for their assistance in preparing these remarks.

² This lecture is an updated and shortened version of the Per Jacobsson lecture that I delivered in October 2014.

In a progressively integrating world economy and financial system, a central bank cannot ignore developments beyond its country's borders, and the Fed is no exception. This is true even though the Fed's statutory objectives are defined as specific goals for the U.S. economy. In particular, the Federal Reserve's objectives are given by its dual mandate to pursue maximum sustainable employment and price stability, and our policy decisions are targeted to achieve these dual objectives.³ Hence, at first blush, it may seem that there is little need for Fed policymakers to pay attention to developments outside the United States.

But such an inference would be incorrect. The state of the U.S. economy is significantly affected by the state of the world economy. A wide range of foreign shocks affect U.S. domestic spending, production, prices, and financial conditions. To anticipate how these shocks affect the U.S. economy, the Federal Reserve devotes significant resources to monitoring developments in foreign economies, including emerging market economies (EMEs), which account for an increasingly important share of global growth. The most recent available data show 47 percent of total U.S. exports going to EME destinations. And of course, actions taken by the Federal Reserve influence economic conditions abroad.⁴ Because these international effects in turn spill back on the evolution of the U.S. economy, we cannot make sensible monetary policy choices without taking them into account.

³ The Federal Open Market Committee (FOMC) has judged that 2 percent inflation in the price of personal consumption expenditures is most consistent over the longer run with the Federal Reserve's statutory mandate. For more information, see Federal Open Market Committee (2014). The Fed also has separate responsibilities for promoting financial stability (some of which are spelled out in the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010) that are, in many respects, complementary to the dual mandate. See Yellen (2014) for further discussion.

⁴ For a discussion of the effect of Federal Reserve actions on international economic conditions, see Rey (2015).

In this lecture, I would like to emphasize both aspects of our global connectedness--spillovers from the United States to foreign economies and the effect of foreign economies on the United States.

I. International Transmission of Monetary Policies

The recognition that a change in interest rates in one nation can spill over to other countries dates back at least to the 18th-century writings of David Hume on the international effect of changes in the money supply.⁵ The standard models incorporating the international transmission of monetary policy were developed by Marcus Fleming and Robert Mundell. In the Mundell-Fleming framework, as well as in modern developments of the same theme, a shift toward a more accommodative monetary policy in the United States spills over to foreign economies by causing their interest rates to fall--though typically by less than in the United States--and their currencies to appreciate against the dollar. At the same time, international capital flows tend to shift toward foreign economies in response to their relatively more attractive interest rates.

The pass-through of changes in U.S. policy rates abroad depends importantly on how foreign monetary authorities respond. A decline in U.S. policy rates has a relatively large effect on foreign policy rates in economies that opt to limit exchange rate fluctuations, at least for economies with reasonably open capital accounts. By contrast, a central bank in an economy with a freely floating exchange rate might choose to lower its interest rate by a much smaller amount than in the United States if it believes that domestic conditions so warrant. In this case, the country's exchange rate would

⁵ See Hume (1742).

appreciate as investors rebalance their portfolios in favor of assets denominated in its currency in response to the higher interest rate differential.⁶

There is also evidence that monetary policy actions can influence investors' willingness to hold risky assets, the so-called risk-taking channel.⁷ Such effects seem to be most potent when financial conditions are stressed. And countries that offer high prospective returns but have weak policy frameworks or other structural vulnerabilities may be particularly sensitive to fluctuations in international investment associated with global risk factors.⁸

Effects of monetary accommodation since the global financial crisis

After the 2007-08 global financial crisis, there has been heightened concern about the international spillovers of monetary policies--and of ours, in particular. Some EME critics argued that U.S. policy accommodation contributed to a surge of capital inflows and excessive credit growth in their economies, creating risks of financial instability. But, as time wore on, most EMEs seemed glad to receive those flows.

There is little doubt that the aggressive actions the Federal Reserve took to mitigate the effects of the global financial crisis significantly affected asset prices at

⁶ See Mundell (1963) and Fleming (1962). One key implication of the Mundell-Fleming framework is that a central bank can exercise full control over both the exchange rate and the domestic interest rate only when there are significant barriers to the international capital mobility. Accordingly, policymakers face the constraint of the "impossible trinity," which states that a country cannot simultaneously have an independent monetary policy, free capital movement, and a fixed exchange rate.

⁷ Several recent papers discuss risk-taking channels through which monetary policy influences financial conditions more broadly than the level of safe interest rates. See Borio and Zhu (2012), Rey (2015), Morris and Shin (2014), Bruno and Shin (2015), and the Hanson and Stein (2015) "reaching for yield" concept.

⁸ Studies using panel data typically have found that country-specific factors help explain cross-sectional differences in international investment and capital flows. See, for example, Furceri, Guichard, and Rusticelli (2011); Fratzscher (2012); and Luca and Spatafora (2012). Avdjiev and Takáts's (2014) study of cross-border bank lending during the "taper tantrum" shows a larger pullback for countries with weaker current account balances, and Sahay and others (2014) find that country-specific market reactions during this period also were affected by high inflation, weak growth prospects, and relatively low reserves.

home and abroad as well as international capital flows. While the Fed's asset purchases were composed wholly of Treasury, agency, and agency-backed securities (for legal and practical reasons), the program also aimed to boost the prices of riskier assets and ease financial conditions for the private sector.⁹ (And this is what the textbooks say the program should have done.) The preponderance of evidence suggests that the Fed's asset purchases raised the prices of the assets purchased and close substitutes as well as those of riskier assets.¹⁰

Importantly, evidence shows that foreign asset markets have been significantly affected by the Fed's purchase programs.¹¹ For example, event studies of announcements associated with the Fed's purchase programs have found that they prompted inflows into investment funds holding both foreign debt and foreign equity securities.

Of course, other countries' monetary policy announcements can also leave an imprint on international asset prices, with market reactions to new initiatives enacted by the European Central Bank (ECB) one recent example.¹² However, event studies tend to find larger international interest rate spillovers for U.S. policy announcements than for those of other central banks.¹³

⁹ See, for example, Bernanke (2010a, 2010b).

¹⁰ See, for example, D'Amico and King (2013); Gagnon, Raskin, Remache, and Sack (2011); Hamilton and Wu (2012); and Rogers, Scotti, and Wright (2014).

¹¹ See Neely (2011); Fratzscher, Lo Duca, and Straub (2013); Rogers, Scotti, and Wright (2014); and Bowman, Londono, and Sapriza (2014). Also, Ahmed and Zlate (2014) show that both conventional and nonconventional U.S. monetary expansion have driven capital flows into EMEs.

¹² See Rogers, Scotti, and Wright (2014) and Chen, Filardo, He, and Zhu (2012) for more systematic evidence.

¹³ See, for example, Rogers, Scotti, and Wright's (2014) recent event study of central bank announcement effects on sovereign yields in different countries. Similarly, earlier work by Ehrmann and Fratzscher (2005) finds larger reactions in euro-area interest rates to U.S. rate changes than vice versa.

Earlier studies of the international effects of conventional U.S. monetary policy--namely, changes in the policy rate--have also found significant spillovers to asset prices in other countries.¹⁴ Studies that have compared the spillovers of monetary policy across conventional and unconventional measures generally conclude that the effects on global financial markets are roughly similar.¹⁵

Given the relatively fast recovery of many EMEs from the crisis, post-crisis monetary accommodation in the United States and other advanced economies created policy challenges for many EMEs.¹⁶ If they resisted currency appreciation pressures by lowering their policy rates, they risked overstimulating domestic demand, exacerbating financial excesses, and overheating their economies. If, instead, they reduced their policy rates less than the United States had done while intervening to resist currency appreciation, capital inflows could have increased further, thus partially offsetting their attempts to stabilize their economies. And, if they allowed currency appreciation pressures to pass through to their full extent, this could threaten their recoveries by hurting exports. In the event, EMEs tried to make the best of a difficult set of tradeoffs by allowing some exchange rate appreciation, partially reducing their interest rates, and in some countries also using capital controls.

¹⁴ See, for example, Ehrmann and Fratzscher (2009) and Hausman and Wongswan (2011).

¹⁵ Among studies of spillovers from conventional versus unconventional U.S. monetary policy, Rogers, Scotti, and Wright (2014) report no significant differences in relative announcement effects on advanced foreign economy asset prices and Treasury yields; Bowman, Londono, and Sapriza (2014) find similar EME asset price responses; Takáts and Vela (2014) report mixed results for EMEs, with a weaker post-2007 relationship in levels of EME policy rates with U.S. rates but a stronger post-2008 relationship in levels of five-year yields; and Glick and Leduc (2013) also report similar spillovers to exchange rates. The effects of the Bank of England's quantitative easing program on corporate bond yields and sterling exchange rates are similar to predictions from a model estimated over an earlier period by Joyce, Lasaoa, Stevens, and Tong (2011).

¹⁶ See the discussion in Bernanke (2012).

I would also argue strongly that U.S. monetary policies were not beggar thy neighbor policies in that, on balance, they generally did not drain demand from other economies. Federal Reserve staff analysis finds that an easing of monetary policy in the United States benefits foreign economies from both stronger U.S. activity and improved global financial conditions.

The “taper tantrum” of 2013

We should also expect spillovers when monetary policy is tightened. Central bank communications can be a tricky business. And indeed, financial markets reacted strongly to the first statements by Chairman Bernanke in the spring of 2013 that the Fed’s asset purchases were likely to decelerate in the near future and come to an end not long after that. Some market participants clearly understood these statements to be broadly in line with previous guidance about the eventual normalization of policy as recovery of the U.S. economy took hold. But others may have grown accustomed to continuing asset purchases; the most recent program of quantitative easing, commonly referred to as QE3, had been first announced less than a year before and was proceeding at a steady pace of \$85 billion per month.

The onset of the taper tantrum went well beyond a roiling of U.S. financial markets. Spillovers to other advanced-economy financial markets included stock price declines, significant increases in sovereign yields, higher overnight interest swap rates in the United Kingdom and euro area, and rising credit spreads in some countries.

Spillovers to EME asset markets were significantly stronger. Inflows to EME investment funds reversed sharply, EME currencies depreciated, and other asset prices declined.¹⁷

II. Normalization of Monetary Policies

The cumulative effects over half of a decade of the extraordinary actions by the Federal Reserve and other central banks will need to be unwound in the coming years as the U.S. and other economies make progress toward economic recovery. In the normalizing of its policy, just as when loosening policy, the Federal Reserve will take account of how its actions affect the global economy.

The taper tantrum episode notwithstanding, most EMEs have generally weathered the wind-down of our asset purchases reasonably well so far. The actual raising of policy rates could trigger further bouts of volatility, but my best estimate is that the normalization of our policy should prove manageable for the EMEs. We have done everything we can, within the limits of forecast uncertainty, to prepare market participants for what lies ahead.

The Federal Reserve and other central banks are going to great lengths to communicate policy intentions and strategies clearly. Given this, markets should not be greatly surprised by either the timing or the pace of normalization. In fact, it bears mentioning that, following the taper tantrum, when the Fed started to taper its purchases, there was little reaction from markets.

¹⁷ Powell (2013) notes that EMEs with larger current account deficits experienced both greater depreciations of their currencies and larger increases in their bond yields in mid-2013, suggesting that, while a reassessment of U.S. monetary policy may have triggered the retrenchment from EME assets, investor concerns about underlying vulnerabilities appear to have amplified the reactions.

The tightening of U.S. policy will begin only when the U.S. expansion has advanced far enough--when we have seen further improvement in the labor market and when we are reasonably confident that the inflation rate will rise to our 2 percent goal.¹⁸ The stronger U.S. economy should directly benefit our foreign trading partners by raising the demand for their exports, and perhaps also indirectly, by boosting confidence globally. And if foreign growth is weaker than anticipated, the consequences for the U.S. economy could lead the Fed to remove accommodation more slowly than otherwise.

The EMEs themselves have generally done a good job of reducing their financial and economic vulnerabilities over the past couple of decades, which should bolster their resilience should normalization lead to financial market stresses. Since the 1990s, many EMEs have made remarkable progress in reducing inflation, improving government debt ratios, building foreign reserves, and better regulating and capitalizing their banking systems. In addition, the development of local-currency debt markets has made EMEs less vulnerable to exchange rate fluctuations. To be sure, some EMEs continue to face a wide array of structural and policy challenges, including, prominently, rapid credit growth. But it does not seem that the overall risks to global financial stability are unusually elevated at this time.

Nevertheless, it could be that some more vulnerable economies, including those that pursue overly rigid exchange rate policies, may find the road to normalization somewhat bumpier. This gives all the more reason for the Fed and other major central banks to communicate policy intentions clearly and for EMEs to continue to strengthen

¹⁸ See Yellen (2015) for further discussion of the determinants of the pace of normalization.

their policy frameworks and to consider their own policy responses to the forthcoming normalization in the United States and some other advanced economies.

III. The Fed's Responsibility to the Global Economy

So far, I have focused on the immediate spillovers of U.S. monetary policy abroad and the feedback of those effects to the U.S. economy. More tacitly than explicitly stated has been my view that the United States is not just any economy and, thus, the Federal Reserve not just any central bank. The U.S. economy represents nearly one-fourth of the global economy measured at market rates and a similar share of gross capital flows. The significant size and international linkages of the U.S. economy mean that economic and financial developments in the United States have global spillovers. It is, therefore, important to ask, what is the Federal Reserve's responsibility to the global economy?

First and foremost, it is to keep our own house in order. Economic and financial volatility in *any* country can have negative consequences for the world, but sizable and significant spillovers are almost assured from an economy that is large. There is no question that sharp declines in U.S. output or large deviations of U.S. inflation from its target level would have adverse effects on the global economy. Conversely, strong and stable U.S. growth in the context of inflation close to our policy objective has substantial benefits for the world. Thus, 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.

As the recent financial crisis showed all too clearly, to achieve this objective, we must take financial stability into account. For half a decade, we have been working to

understand and better guard against the financial disruptions that were the genesis of the Great Recession. These efforts have spawned many speeches, including some of my own, which testify to our efforts.¹⁹ In these speeches, we often emphasize that, given the integration of global capital markets, what happens in one market affects others. Thus, our efforts to stabilize the U.S. financial system also have positive spillovers abroad.

These financial stability responsibilities do not stop at our borders, given the size and openness of our capital markets and the unique position of the U.S. dollar as the world's leading currency for financial transactions. For example, the global financial crisis highlighted the extent of borrowing and lending in U.S. dollars by foreign financial institutions. When these institutions came under pressure, their actions contributed to the strains in both foreign and domestic dollar funding markets. To achieve financial stability domestically and maintain the flow of credit to American households and businesses, we took action. Importantly, we developed swap facilities with central banks in countries that represented major financial markets or trading centers in order to facilitate the provision of dollar liquidity to these markets.

We did so in recognition of the scope of dollar markets and dollar-denominated transactions outside of our country, the benefits they provide to U.S. households and firms, and the adverse consequences to our financial markets if these centers lose access to dollar liquidity. We have continued to maintain swap facilities with a number of

¹⁹ Bernanke (2014), Fischer (2014), and Tarullo (2014) also discuss concrete steps that U.S. authorities have taken in the past five years to implement financial reform of large financial institutions (including introducing a systematic framework for stress-testing, stronger capital and liquidity requirements, and progress on resolution mechanisms for failed institutions), of financial market infrastructures, and in short-term funding markets.

central banks. Although usage is currently very low, these facilities represent an important backstop in the event of a resurgence in global financial tensions.

But I should caution that the responsibility of the Fed is not unbounded. My teacher Charles Kindleberger argued that stability of the international financial system could best be supported by the leadership of a financial hegemon or a global central bank.²⁰ But I should be clear that the U.S. Federal Reserve System is not that bank. Our mandate, like that of virtually all central banks, focuses on domestic objectives. As I have described, to meet those domestic objectives, we must recognize the effect of our actions abroad, and, by meeting those domestic objectives, we best minimize the negative spillovers we have to the global economy. And because the dollar features so prominently in international transactions, we must be mindful that our markets extend beyond our borders and take precautions, as we have done before, to provide liquidity when necessary.

That said, the world is not without other resources to guard against adverse economic and financial spillovers. Most obviously, the International Monetary Fund has played and will continue to play a critical role in providing liquidity and financial support to its member countries. In the United States, we are working to ensure that our financial institutions and other market participants are prepared for the normalization of monetary policy and the return to a world of higher interest rates. It is equally important that individuals, businesses, and institutions around the world do the same. For our part, the Federal Reserve will promote a smooth transition by communicating our assessment of the economy and our policy intentions as clearly as possible.

²⁰ See Kindleberger (1986).

IV. Concluding Remarks

To summarize and conclude, the Fed's statutory objectives are defined by its dual mandate to pursue maximum sustainable employment and price stability in the U.S. economy. But the U.S. economy and the economies of the rest of the world have important feedback effects on each other. To make coherent policy choices, we have to take these feedback effects into account. The most important contribution that U.S. policymakers can make to the health of the world economy is to keep our own house in order--and the same goes for all countries. Because the dollar is the primary international currency, we have, in the past, had to take action--particularly in times of global economic crisis--to maintain order in international capital markets, such as the central bank liquidity swap lines extended during the global financial crisis. In that case, we were acting in accordance with our dual mandate, in the interest of the U.S. economy, by taking actions that also benefit the world economy. Going forward, we will continue to be guided by those same principles.

References

- Ahmed, Shaghil, and Andrei Zlate (2014). “Capital Flows to Emerging Market Economies: A Brave New World?” *Journal of International Money and Finance*, vol. 48 (November), pp. 221-28.
- Avdjiev, Stefan, and Előd Takáts (2014). “Cross-Border Bank Lending during the Taper Tantrum: The Role of Emerging Market Fundamentals,” *BIS Quarterly Review*, September, pp. 49-60, www.bis.org/publ/qtrpdf/r_qt1409g.pdf.
- Bernanke, Ben S. (2010a). “The Economic Outlook and Monetary Policy,” speech delivered at the Federal Reserve Bank of Kansas City Economic Symposium, Jackson Hole, August 27, www.federalreserve.gov/newsevents/speech/bernanke20100827a.htm.
- (2010b). “Semiannual Monetary Policy Report to the Congress,” statement before the Committee on Banking, Housing, and Urban Affairs, U.S. Senate, Washington, July 21, www.federalreserve.gov/newsevents/testimony/bernanke20100721a.htm.
- (2012). “U.S. Monetary Policy and International Implications,” speech delivered at “Challenges of the Global Financial System: Risks and Governance under Evolving Globalization,” a seminar sponsored by the Bank of Japan and the International Monetary Fund, Tokyo, Japan, October 14, www.federalreserve.gov/newsevents/speech/bernanke20121014a.htm.
- (2014). “The Federal Reserve: Looking Back, Looking Forward,” speech delivered at the Annual Meeting of the American Economic Association, Philadelphia, January 3, www.federalreserve.gov/newsevents/speech/bernanke20140103a.htm.
- Borio, Claudio, and Haibin Zhu (2012). “Capital Regulation, Risk-Taking and Monetary Policy: A Missing Link in the Transmission Mechanism?” *Journal of Financial Stability*, vol. 8 (December), pp. 236-51.
- Bowman, David, Juan M. Londono, and Horacio Sapriza (2014). “U.S. Unconventional Monetary Policy and Transmission to Emerging Market Economies,” International Finance Discussion Papers 1109. Washington: Board of Governors of the Federal Reserve System, June, www.federalreserve.gov/pubs/ifdp/2014/1109/ifdp1109.pdf.
- Bruno, Valentina, and Hyun Song Shin (2015). “Cross-Border Banking and Global Liquidity,” *Review of Economic Studies*, vol. 82 (April), pp. 535-64.
- Chen, Qianying, Andrew Filardo, Dong He, and Feng Zhu (2012). “International Spillovers of Central Bank Balance Sheet Policies,” BIS Papers Series 66p.

- Basel, Switzerland: Bank for International Settlements, October, www.bis.org/publ/bppdf/bispap66p.pdf.
- D'Amico, Stefania, and Thomas B. King (2013). "Flow and Stock Effects of Large-Scale Treasury Purchases: Evidence on the Importance of Local Supply," *Journal of Financial Economics*, vol. 108 (May), pp. 425-48.
- Ehrmann, Michael, and Marcel Fratzscher (2005). "Equal Size, Equal Role? Interest Rate Interdependence between the Euro Area and the United States," *Economic Journal*, vol. 115 (October), pp. 930-50.
- (2009). "Global Financial Transmission of Monetary Policy Shocks," *Oxford Bulletin of Economics and Statistics*, vol. 71 (December), pp. 739-59.
- Federal Open Market Committee (2014). Statement on Longer-Run Goals and Monetary Policy Strategy. Washington: Board of Governors of the Federal Reserve System, January 28, www.federalreserve.gov/monetarypolicy/files/FOMC_LongerRunGoals.pdf.
- Fischer, Stanley (2014). "Financial Sector Reform: How Far Are We?" speech delivered at the Martin Feldstein Lecture at the National Bureau of Economic Research, Cambridge, Mass., July 10, www.federalreserve.gov/newsevents/speech/fischer20140710a.htm.
- Fleming, J. Marcus (1962). "Domestic Financial Policies under Fixed and under Floating Exchange Rates," *International Monetary Fund Staff Papers*, vol. 9 (November), pp. 369-80.
- Fratzscher, Marcel (2012). "Capital Flows, Push versus Pull Factors and the Global Financial Crisis," *Journal of International Economics*, vol. 88 (November), pp. 341-56.
- Fratzscher, Marcel, Marco Lo Duca, and Roland Straub (2013). "On the International Spillovers of U.S. Quantitative Easing," Working Paper Series 1557. Frankfurt: European Central Bank, June, www.ecb.europa.eu/pub/pdf/scpwps/ecbwp1557.pdf.
- Furceri, Davide, Stephanie Guichard, and Elena Rusticelli (2011). "Medium-Term Determinants of International Investment Positions: The Role of Structural Policies," OECD Economics Department Working Paper Series 863. Paris: Organisation for Economic Co-operation and Development, May, www.oecd-ilibrary.org/economics/medium-term-determinants-of-international-investment-positions_5kgc9kzsm19x-en?crawler=true.
- Gagnon, Joseph, Matthew Raskin, Julie Remache, and Brian Sack (2011). "Large-Scale Asset Purchases by the Federal Reserve: Did They Work?" Federal Reserve

- Bank of New York, *Economic Policy Review*, vol. 17 (May), pp. 41-59, www.newyorkfed.org/research/epr/11v17n1/1105gagn.pdf.
- Glick, Reuven, and Sylvain Leduc (2013). "The Effects of Unconventional and Conventional U.S. Monetary Policy on the Dollar," Working Paper Series 2013-11. San Francisco: Federal Reserve Bank of San Francisco, May, www.frbsf.org/economic-research/files/wp2013-11.pdf.
- Hamilton, James D., and Jing Cynthia Wu (2012). "The Effectiveness of Alternative Monetary Policy Tools in a Zero Lower Bound Environment," *Journal of Money, Credit and Banking*, vol. 44 (February), pp. 3-46.
- Hanson, Samuel G., and Jeremy C. Stein (2015). "Monetary Policy and Long-Term Real Rates," *Journal of Financial Economics*, vol. 115 (March), pp. 429-48.
- Hausman, Joshua, and Jon Wongswan (2011). "Global Asset Prices and FOMC Announcements," *Journal of International Money and Finance*, vol. 30 (April), pp. 547-71.
- Hume, David (1742). "Of Interest," *Political Discourses*, essay IV, in Eugene F. Miller, ed., *Essays, Moral, Political, and Literary*. Indianapolis: Liberty Fund, Inc. (1987), www.econlib.org/library/LFBooks/Hume/hmMPL27.html.
- Joyce, Michael A.S., Ana Lasasosa, Ibrahim Stevens, and Matthew Tong (2011). "The Financial Market Impact of Quantitative Easing in the United Kingdom," *International Journal of Central Banking*, vol. 7 (September), pp. 113-61.
- Kindleberger, Charles P. (1986). *The World in Depression, 1929-1939*. Berkeley, Calif.: University of California Press.
- Luca, Oana, and Nikola Spatafora (2012). "Capital Inflows, Financial Development, and Domestic Investment: Determinants and Inter-Relationships," IMF Working Paper Series WP/12/120. Washington: International Monetary Fund, May, www.imf.org/external/pubs/ft/wp/2012/wp12120.pdf.
- Morris, Stephen, and Hyun Song Shin (2014). "Risk-Taking Channel of Monetary Policy: A Global Game Approach," working paper, Princeton University, January, www.princeton.edu/~hsshin/www/risk_taking_channel_lbh.pdf.
- Mundell, Robert A. (1963). "Capital Mobility and Stabilization Policy under Fixed and Flexible Exchange Rates," *Canadian Journal of Economic and Political Science*, vol. 29 (November), pp. 475-85.
- Neely, Christopher J. (2011). "The Large-Scale Asset Purchases Had Large International Effects," Working Paper Series 2010-018C. St. Louis: Federal Reserve Bank of

- St. Louis, January, http://research.stlouisfed.org/conferences/qe/Neely_--_2010-018_1_.pdf.
- Powell, Jerome H. (2013). “Advanced Economy Monetary Policy and Emerging Market Economies,” speech delivered at the Federal Reserve Bank of San Francisco 2013 Asia Economic Policy Conference, San Francisco, November 4, www.federalreserve.gov/newsevents/speech/powell20131104a.htm.
- Rey, Hélène (2015). “Dilemma Not Trilemma: The Global Financial Cycle and Monetary Policy Independence,” NBER Working Paper Series 21162. Cambridge, Mass.: National Bureau of Economic Research, May.
- Rogers, John H., Chiara Scotti, and Jonathan H. Wright (2014). “Evaluating Asset-Market Effects of Unconventional Monetary Policy: A Cross-Country Comparison,” International Finance Discussion Papers 1101. Washington: Board of Governors of the Federal Reserve System, March, www.federalreserve.gov/pubs/ifdp/2014/1101/ifdp1101.pdf.
- Sahay, Ratna, Vivek Arora, Thanos Arvanitis, Hamid Faruquee, Papa N’Diaye, Tommaso Mancini-Griffoli, and an IMF Team (2014). “Emerging Market Volatility: Lessons from the Taper Tantrum,” IMF Staff Discussion Note SDN/14/09. Washington: International Monetary Fund, September, www.imf.org/external/pubs/ft/sdn/2014/sdn1409.pdf.
- Takáts, Előd, and Abraham Vela (2014). “International Monetary Policy Transmission,” BIS Papers Series 78. Basel, Switzerland: Bank for International Settlements, August, www.bis.org/publ/bppdf/bispap78b_rh.pdf.
- Tarullo, Daniel K. (2014). “Stress Testing after Five Years,” speech delivered at the Third Annual Stress Test Modeling Symposium, sponsored by the Board of Governors of the Federal Reserve System and the Federal Reserve Bank of Boston, Boston, June 25, www.federalreserve.gov/newsevents/speech/tarullo20140625a.htm.
- Yellen, Janet L. (2014). “Monetary Policy and Financial Stability,” speech delivered at the 2014 Michel Camdessus Central Banking Lecture, sponsored by the International Monetary Fund, Washington, July 2, www.federalreserve.gov/newsevents/speech/yellen20140702a.htm.
- (2015). “Normalizing Monetary Policy: Prospects and Perspectives,” speech delivered at “The New Normal Monetary Policy,” a research conference sponsored by the Federal Reserve Bank of San Francisco, San Francisco, March 27, www.federalreserve.gov/newsevents/speech/yellen20150327a.htm.