

The Great Liquidity Boom and the Monetary Superpower Hypothesis

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Introduction

THE ECONOMIC BOOM of the early-to-mid 2000s was not just a U.S. phenomenon. It was a global one. Beginning in the early 2000s, the world economy began an expansion that had the fastest sustained economic growth in thirty years. At its peak during this boom, the global economy was growing at about a 5.0-percent annual average growth rate¹ compared to about a 3.5-percent average for the 1970–2001 period. This global economic boom has been attributed to the opening up of Asia, technological gains, and the ongoing liberalization of the real economy throughout the world. It has also been attributed, however, to a rapid expansion of global liquidity.²

This surge in global liquidity can be seen in Figure 4.1. This figure shows that both narrow and broad measures of the money supply in the G-5 countries (France, Germany, Japan, the United Kingdom, and the United States) start growing faster than the underlying economies around 2002.³ Global foreign

1. This average is for the 2004–2007 period. “Global Prospects and Policies,” *World Economic Outlook*, October 2008, 3–48.

2. Bank for International Settlements, “Rescue, Recovery, and Reform” (Annual Report for the Bank for International Settlements, 2009: 3–14); Ansgur Belke and Daniel Gros, “Global Liquidity, World Saving Glut and Global Policy Coordination” (Discussion Paper 473, DIW Berlin, 2010).

3. Narrow money is seasonally adjusted M1, except for the United Kingdom where M0 is used. Broad money is seasonally adjusted M3, except for the United Kingdom where M4 is used. Quarterly world nominal GDP is an interpolated version of the IMF’s (International Monetary Fund’s) annual world nominal GDP. It is interpolated using the Chow and Lin method where an indicator series, here the OECD quarterly nominal GDP, is used to aid the interpolation (*see* Gregory Chow and AnLoh Lin, “Best Linear Unbiased

exchange reserves also take off, going from about \$2 trillion in 2002 to over \$5 trillion by the end of 2006. They, too, grow faster than the underlying global economy. Given this rapid growth of the global money stock, the global real short-term interest rate turns negative and deviates significantly from the global real GDP growth rate during this time.⁴ If one views the global real GDP growth rate as an indicator of the return to investing in the global economy and the global real interest rate as the cost of financing that investment, then the large gap that emerges between them means there was a strong incentive to leverage up and invest in the global economy. The next few graphs in the figure indicate that this is exactly what happened. They show that the amount of debt securities in the global economy sharply increased at this time.⁵ Finally, Figure 4.1 reveals that the surge in global liquidity coincided with a global housing boom, a finding consistent with other studies that show global asset prices in general were supported by the rise in global liquidity.⁶ The global economic boom of the early-to-mid 2000s, then, was closely tied to a global liquidity boom during this time.

What explains this global liquidity boom? One view, associated in particular with Federal Reserve Board Chairman Ben Bernanke, posits that a global “saving glut” was behind the global liquidity boom. This view holds that in a number of countries, most notably China and a number of oil exporters, desired savings exceeded desired investment. This global excess savings was manifested in higher current account surpluses for these countries and meant that other economies, mainly the United States and some other Anglo-Saxon countries, had

Interpolation, Distribution, and Extrapolation of Time Series by Related Series,” *Review of Economics and Statistics* 53 (1971): 372–75). All the data in Figure 4.1 come from the IMF’s International Financial Statistics database, the IMF’s World Economic Outlook database, and the OECD (Organisation for Economic Co-ordination and Development) online database.

4. The G5 real interest rate is used as the measure of global real interest rates. It is a GDP-weighted average of the individual G5 ex-post real interest rate. The global real GDP measured is constructed the same way as global nominal GDP using the real counterparts.

5. The debt securities are the sum of the Bank for International Settlements’ domestic and international debt securities series.

6. Sebastian Becker, “Global Liquidity ‘Glut’ and Asset Price Inflation: Fact or Fiction?” (Deutsche Bank Research Note, May 29, 2007); Jacopo Carmassi, Daniel Gros, and Stefano Micossi, “The Global Financial Crisis: Causes and Cures,” *Journal of Common Market Studies* 47 (2009): 977–96.

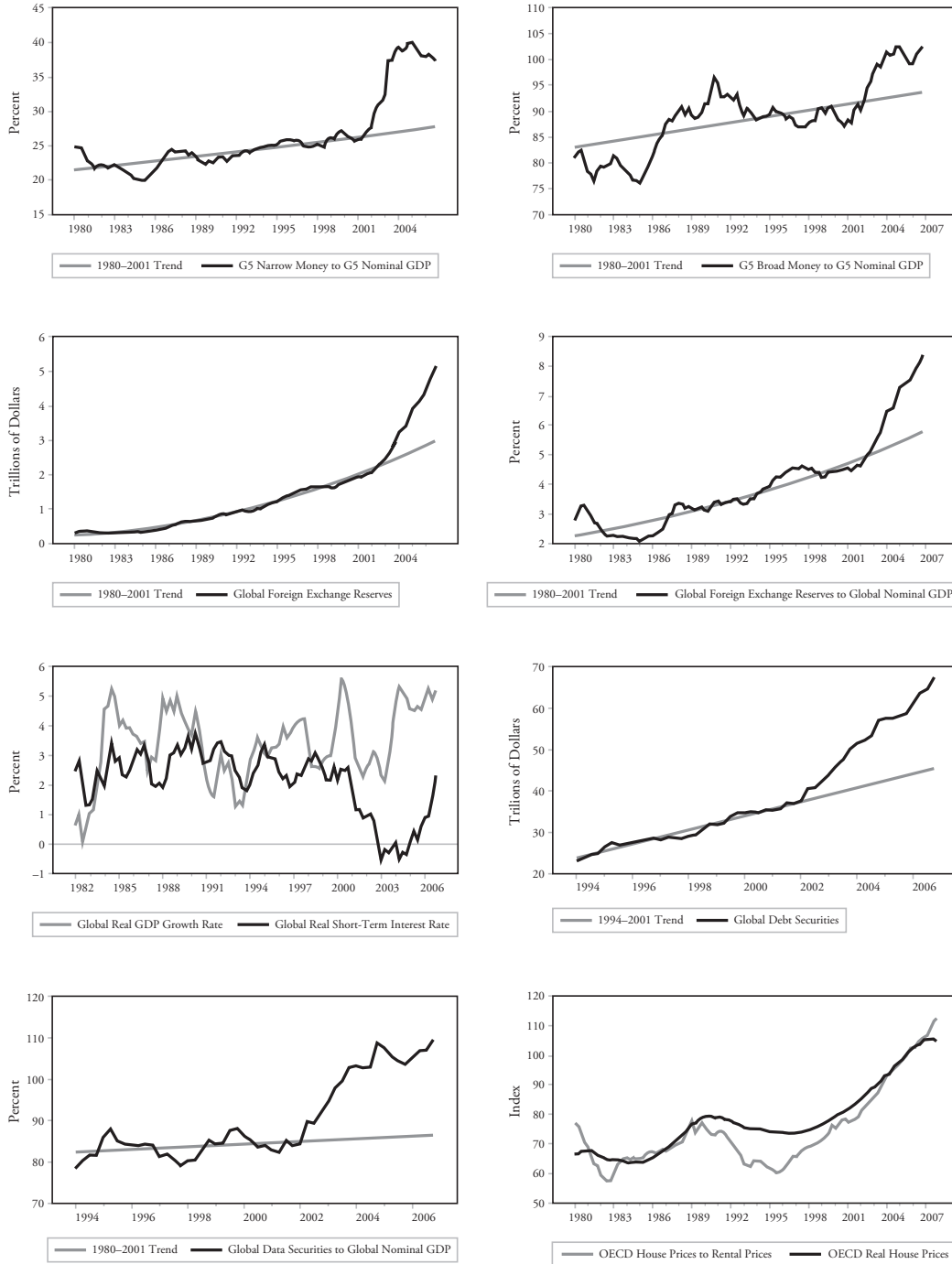


Figure 4.1. The Global Liquidity and Credit Boom

Source: IMF IFS Database, BIS Database, FRED Databases, and Authors' Calculations

to use the excess savings by running current account deficits.⁷ The global liquidity boom, therefore, was nothing more than the surge in excess saving finding its way around the world to these advanced economies. Along the way, it depressed real long-term interest rates, which in turn discouraged domestic saving and increased asset values (particularly in housing) in these recipient economies. The excess savings also encouraged the U.S. financial sector to create new “safe” and liquid financial assets (e.g., asset-backed securities linked to housing loans) to satisfy this foreign thirst for financial claims on the United States.⁸

Others, however, have disputed this view, arguing that there is little evidence for a saving glut as a cause rather than a consequence of the global liquidity boom. They see the highly accommodative stance of U.S. monetary policy in the early-to-mid 2000s in conjunction with the decision of other countries to peg their currency to the dollar being behind the buildup of global imbalances. According to this view, U.S. monetary policy got recycled back to the advanced economies via the dollar-pegged economies acquisition of foreign exchange reserves. These economies had to buy up dollars to maintain their dollar pegs as U.S. monetary policy loosened. In turn, these dollars were used to purchase securities from the advanced economies, mainly the United States. What appeared, then, as a saving glut finding its way to the advanced economies was instead a recycling of U.S. monetary policy.⁹

7. Ben Bernanke. “The Global Saving Glut and the U.S. Current Account Deficit” (speech delivered to the Virginia Association of Economists, 2005); B. Bernanke, “Global Imbalances: Recent Developments and Prospects” (speech delivered to Bundesbank in Germany, 2007).

8. Ricardo Caballero and Arvind Krishnamurthy, “Global Imbalances and Financial Fragility,” *American Economic Review: Papers and Proceedings* 99 (2009): 584–88; Ben Bernanke, “Global Imbalances: Links to Economic and Financial Stability” (speech delivered to Banque de France Financial Stability Review in France, 2011).

9. Daniel Gros, Thomas Mayer, and Angel Ubide, “A World Out of Balance?” (Special Report of the CEPS Macroeconomic Policy Group, 2006); Thierry Bracke and Michael Fidora, “Global Liquidity Glut or Global Savings Glut? A Structural VAR Approach” (European Central Bank Working Paper 911, 2008); J. Carmassi et al., “The Global Financial Crisis”; Maurice Obstfeld and Kenneth Rogoff, “Global Imbalances and the Financial Crisis: Products of Common Causes,” *Asia Economic Policy Conference Volume* (Federal Reserve Bank of San Francisco, October 19–20, 2009): 131–72; M. Vermeiren, “The Global Imbalances and the Contradictions of U.S. Monetary Hegemony,” *Journal of International Relations and Development* 13 (2010): 105–35.

This perspective also holds that because U.S. monetary policy was being exported to much of the world through the dollar-pegged countries, the Bank of Japan and the European Central Bank also had to follow to some extent the stance of U.S. monetary policy lest their currencies become overvalued. The Federal Reserve, therefore, was effectively a monetary superpower that created a global liquidity boom.¹⁰ Finally, the low global interest rates caused by the global liquidity boom created a “search for yield” by fixed-income investors while encouraging other investors like hedge funds to take on more leverage. These developments, along with the purchase of U.S. securities by the dollar-pegged economies, are what encouraged the U.S. financial sector to convert risky assets into “safe” assets.

Assessing which explanation for the global liquidity boom is the most plausible is not easy. The global economy, already highly complex, became even more so over the course of the past decade, as globalization of trade and investment flows and financial innovation continued at a bewildering pace. It is hard to condense such a complex system to a simple analytical model with a clear path from cause to effect. As a result, many different explanations are consistent with much of the data. In order to bring some clarity to this debate, we first provide a brief narrative account of the global economy over the period, focusing on the principal facts that any theoretical account of global liquidity boom has to account for.

The Global Economy, 2000–2010

The decade commenced as the long boom of the 1990s, a period of high economic growth and low volatility in the U.S. economy, was giving way to renewed uncertainty. During the 1990s, the United States had provided a relatively safe investment environment. Stock returns were high as a result of the “tech boom”—productivity-enhancing innovations in the information technology sector that were gradually diffusing through the economy. Meanwhile, low inflation and fiscal consolidation reduced perceptions of macroeconomic risk.

10. David Beckworth, “Aggregate Supply-Driven Deflation and Its Implications for Macroeconomic Stability,” *Cato Journal* 28 (2008): 363–84.

The U.S. performance looked particularly impressive in the context of greater global volatility in emerging markets—exemplified by the trauma of the crises in East Asia, Russia, and Brazil—and a relatively sluggish performance in Europe and Japan. However, as the tech boom looked increasingly unsustainable and the Fed raised rates in 1999 and 2000, the U.S. economy slowed, creating widespread fears that the U.S. could follow Japan into a destabilizing period of deflation. Uncertainty increased further in the wake of the 9/11 attacks. In response, the Fed lowered policy rates to historically low levels, and rates remained extremely low for several years. Concurrently, fiscal policy was loosened significantly via tax cuts and increased expenditure.

As a result, the U.S. economy avoided deflation, although jobs growth remained sluggish even as the economy recovered. An unwinding equity price boom was soon replaced with a new and even more pronounced surge in house prices and housing investment. Consumption grew more strongly than incomes, driven in part by increased nominal housing wealth made available through housing equity withdrawal, and the domestic savings rate fell to historic lows. Both house prices and home ownership trended upwards. Although income and job growth remained fairly stagnant, financial innovation, in the shape of lower lending standards and widespread securitization of home lending, made home ownership more affordable—at least as long as house prices were expected to continue their upwards trajectory. Increased affordability was also supported by historically low long-term interest rates.

In the second half of the 1990s, the counterpart of high levels of corporate investment had been savings from the fiscal and external sectors, in the shape of a fiscal surplus and external current account deficit, respectively. By contrast, the counterpart of high levels of residential housing investment and declining household savings in the years after 2000 was an even wider current account deficit, not least as the fiscal position had moved sharply from surplus to deficit. Foreign buyers were particularly active in markets for paper issued by the federal government (Treasury securities) and asset-backed securities, notably collateralized debt obligations created by securitizing prime and (increasingly) subprime mortgages.

Foreign central banks and sovereign wealth funds, in fast-growing Asian economies and commodity exporting countries, were increasingly providing the flow of foreign savings. For commodity exporters (particularly oil exporters),

the rationale was obvious: high commodity prices reflected a temporary increase in wealth which called for a significant portion of the windfall to be saved; in addition, accumulating foreign exchange reserves via sterilized intervention would help to minimize real exchange rate appreciation and prevent the erosion of export competitiveness through so-called “Dutch disease” effects.

Asian countries—particularly China—faced a different dilemma. For many emerging markets, particularly in Asia, the lesson of the Asian financial crisis had been the critical importance of building up sufficient reserves to protect the currency in the event of a speculative attack. Policy-makers noted that speculative capital inflows during good times could easily reverse direction once panic took hold—particularly since domestic capital would likely join the exodus. A sharp currency devaluation could be devastating for the domestic economy—as events in Indonesia in particular testified—since corporations tended to become highly indebted as they sought to grow their businesses in the high growth phase, and currency mismatch was almost inevitable if investment was funded through capital inflows.

Countries in the Asian region—notably China—hoped to avoid this fate via large-scale reserves accumulation. This could limit the risks of an Indonesian-style implosion via three channels. First, reserves accumulated through sterilized foreign exchange market intervention would help prevent real exchange rate appreciation and thus the gradual erosion of competitiveness that had helped to trigger the Asian crisis. Second, if the currency did come under pressure, the accumulated reserves could be used to counter any speculative attack or at least ease the adjustment to a new equilibrium exchange rate. Third, the hard currency could be used to recapitalize any domestic financial institutions caught up in such a crisis, without resorting to fire-sales to foreign banks or excessively weakening the central bank or government balance sheets.

Imbalances were thus emerging simultaneously across sectors and regions of the world economy. Countries in Asia, particularly China, were recording increasing current account surpluses driven by exports of labor-intensive manufactured goods. As capital was also flowing into the region to support increasing levels of investment, the counterpart of these flows was significant reserves accumulation, mostly of U.S. Treasuries. The high level of global growth was simultaneously driving up demand for raw materials. As a result, commodity prices (including oil prices) were driven up to record levels, creating additional

surpluses in commodity exporting countries, which were again offset by reserves accumulation. Meanwhile, low levels of inflation in the U.S., caused in part by imported price deflation from low-cost Asian imports, led the Fed to maintain interest rates at record lows until 2004. At the same time, low interest rates supported a new asset price boom in the housing sector—not just in the U.S., but also across a surprisingly broad range of countries.¹¹

Understanding the ultimate driving force behind these developments and their relationship to the global liquidity boom has taxed policymakers and academic economists, and the issue has become the center of a key debate in international macroeconomics. Assessing causality is particularly hard in this case because key decision-makers made policy choices conditional on choices made—or expected to be made—by other “players.” Assessing causality then comes down to deciding between the plausibility of different counterfactuals: given the choices of others, could a particular player have behaved differently?

According to the “saving glut” hypothesis, the key exogenous factor behind the global liquidity boom was the imbalance of savings over investment in oil producing countries and Asian economies, which drove down global interest rates and created deflationary pressures in the world economy. In this view, agents in the United States—home buyers and central bankers alike—were simply responding to the incentives created by these flows. The counterfactual under this hypothesis is that if these countries had increased their domestic demand (through fiscal or monetary stimulus or by letting their currencies appreciate, increasing effective income levels and promoting imports), then the saving glut would have evaporated, long-term interest rates would have increased to their equilibrium levels, and the house price boom would have been largely ameliorated.

An alternative hypothesis for the global liquidity boom is that the main exogenous factor was the behavior of the Federal Reserve, in lowering interest rates so precipitously in 2000–2001 and keeping them at such low levels through 2004. Low interest rates discouraged saving in the United States and created the conditions for rapid house price growth driven by a surge in household borrowing. Low interest rates also meant the dollar-pegged economies

11. For more on the growth of global capital flows during this time, see Martin Wolf, *Fixing Global Finance* (Baltimore: The Johns Hopkins University Press, 2010).

had to buy up dollar assets to maintain their peg, channeling additional credit to the U.S. economy. Collectively, these developments elevated U.S. demand and thus widened the deficit on the external current account.

In loosening policy, the Fed was responding in part to deflationary pressures arising from the impact of low-cost Asian imports as well as technological change. Essentially, the global economy faced a series of positive supply shocks, which allowed U.S. output to increase strongly on the back of loose monetary policy even while inflation remained low and stable. Exacerbating the problem was the fact that central banks globally were becoming increasingly focused on inflation as the sole arbiter of imbalances in the economy, at precisely the moment that global disinflationary shocks made headline inflation a poor measure of domestic overheating. In fact, positive supply shocks called for an increase in long-run interest rates, but policymakers responded by pushing down short-term rates, leading to increased imbalances in the economy.

The impact of these monetary policy actions was all the greater because they occurred concurrently with a loosening of fiscal policy as well as widespread financial innovation that helped to drive up house prices and strengthened the financial accelerator effect on demand. In this account, the counterfactual has the Fed loosening more conservatively in 2000–2001, and raising rates earlier in the recovery. Because U.S. monetary policy gets exported to the dollar-pegged economies and, to some extent, to other advanced economies, the Federal Reserve's monetary loosening had a multiplier effect on global demand, driving up asset prices (particularly prices of commodities and housing) worldwide. With a tighter monetary stance, the commodity and house price surge would have been much less pronounced, and the global liquidity boom and related imbalances that emerged during the course of the decade would have been substantially eliminated.

We would stress that—in a world of increasingly complex linkages between economies and sectors—no policymaker has complete freedom of action. The fact that other central banks pegged their currencies to the dollar limited the Fed's ability to set U.S. monetary policy independently. Similarly, deflationary price pressures and the weak job growth caused by intensified competition from low-cost manufacturers in Asia created a bias towards monetary easing, given the Fed's mandate to maintain a stable price level consistent with

full employment. At the same time, however, central banks in Asia were given every incentive to maintain the exchange rate peg and restrain domestic demand, given that they were able to import dollar price stability from the U.S., and that the relatively loose monetary stance emanating from the U.S. was already creating concerns of overheating in sectors of the domestic economy, such as housing. The key question is which player in this policy game had the greater ability to act autonomously. Our view—which we outline in more detail in the “Policy Implications” section below—is that the Fed alone had the power to act more or less independently and was ultimately the source of the global liquidity boom. Thus, the only credible counterfactual is one in which U.S. monetary policy took a less expansionary path from 2000–2001 onwards. But before we progress to this discussion, we discuss in more detail the case for and against the saving glut hypothesis.

The Saving Glut Hypothesis

The saving glut hypothesis is most closely associated with two speeches by Fed Chairman Ben Bernanke¹² on global imbalances and the U.S. current account deficit. Bernanke points to increased current account surpluses on the part of emerging market economies as the main counterpart of the increased current account deficit in the U.S., with these surpluses in turn driven by changes in savings and investment behavior in the countries involved. A key underlying factor was these countries’ response to the financial crises of the late 1990s, which led them to accumulate “war chests” of foreign exchange reserves “as a buffer against potential capital outflows.”¹³ Mercantilist motivations may also have been at work, since reserves were also accumulated “in the context of foreign exchange interventions intended to promote export-led growth by preventing exchange-rate appreciation.”¹⁴ Governments acted as financial intermediaries, issuing debt to domestic savers and using the proceeds to buy up foreign assets, primarily U.S. Treasury Bills. In turn, this glut of emerging market savings (demand for assets in advanced economies,

12. Bernanke, “The Global Saving Glut”; Bernanke, “Global Imbalances: Recent Developments and Prospects.”

13. Bernanke, “The Global Saving Glut.”

14. Bernanke, “The Global Saving Glut.”

particularly that of the United States) drove up the price for these assets. Prior to 2000, much of the asset demand flowed into the stock market, driving up stock prices. Following the end of the tech boom, demand instead flowed into the bond market, leading to higher prices (lower yields). This in turn reduced the incentive for consumers in the affected advanced economies to save.

Bernanke goes on to ask “why the current-account effects of the increase in desired global saving were felt disproportionately in the United States relative to other industrial countries.” His first answer is that the United States was (or at least appeared) a more attractive investment destination than many other advanced countries—because of the high growth enjoyed during the tech boom, as well as the uniquely liquid nature of U.S. asset markets, as demonstrated, for instance, by the kind of financial innovations that allowed U.S. households to sell housing equity created by the house price boom. Thus, Bernanke argues that “external imbalances are to a significant extent a market phenomenon and, in the case of the U.S. deficit, reflect the attractiveness of both the U.S. economy overall and the depth, liquidity, and legal safeguards associated with its capital markets.”¹⁵ Caballero and Krishnamurthy make a similar point, arguing that there was a surge in the global demand for safe debt instruments which created incentives for the innovative U.S. financial sector to create new “safe” assets from the pooling and tranching—via securitization—of relatively risky underlying assets.¹⁶

Bernanke’s second answer to his rhetorical question is that in fact the trends identified in the United States, of widening current account deficits, surging housing markets and declining domestic savings, were common to many advanced economies. Germany and Japan were the sole significant exceptions to this trend.¹⁷

15. Bernanke, “The Global Saving Glut”; Bernanke, “Global Imbalances: Links to Economic and Financial Stability” (speech delivered to Banque de France Financial Stability Review in France, 2011).

16. Caballero and Krishnamurthy, “Global Imbalances and Financial Fragility.”

17. Other analysts have come to a broadly similar view to Bernanke. Thus, the IMF (see IMF, “Global Imbalances: A Saving and Investment Perspective,” *World Economic Outlook*, September 2005, 91–124) argues that the main cause of global current account imbalances was global savings and investment trends. Specifically, the key trends were the decline in public saving (increase in the budget deficit) in the United States, demographic changes in Japan and Europe, and a decline in investment in Asia (excluding

However, the saving glut hypothesis has been disputed by other analysts. Obstfeld and Rogoff argue that a global saving glut could not have caused the decline in real interest rates in the United States and elsewhere in the early 2000s, because the real interest rate started to decline in 2000, whereas desired savings only increased significantly later on.¹⁸ Obstfeld and Rogoff argue that a decline in expected productivity growth following the bursting of the tech bubble, combined with the aggressive monetary easing that followed, are a more convincing explanation for the decline in real interest rates in 2000–2001. Specifically, they argue that “coupled with low long-term interest rates, the accommodative stance of monetary policy, particularly U.S. monetary policy, played a key role in the expansion of both housing-market excesses and the global imbalances starting in 2004.” The Bank for International Settlements came to a similar conclusion in 2009, arguing that U.S. monetary policy easing probably had an impact on global credit conditions that was more than proportionate to the U.S. economy’s size.¹⁹

Obstfeld and Rogoff argue that a saving glut becomes a plausible explanation *after* 2004 (i.e., after the period identified by Bernanke), when several trends converged: (1) global savings rates increased markedly, (2) current account deficits in the United States and other advanced economies widened significantly, and (3) long-run real interest rates remained low despite global monetary policy entering a tightening phase. However, Obstfeld and Rogoff attribute this saving glut in part to the earlier monetary easing—which raised global growth rates, driving up commodity prices—as well as exchange rate intervention by emerging market surplus countries.

Laibson and Mollerstrom (2010)²⁰ make a similar point, arguing that global savings rates did not show a robust upward trend during the 1996–2006 period

China) following the Asian financial crisis. Like Bernanke, these authors argue that the global imbalance of desired savings over investment drove down real long-term interest rates; however, they argue that a low level of investment (relative to the economic cycle), driven by corporate sector behavior, rather than a high level of savings, was the key factor.

18. Obstfeld and Rogoff, “Global Imbalances and the Financial Crisis.”

19. Bank for International Settlements, *Annual Report 2009*, 3–14.

20. David Laibson and Johanna Mollerstrom, “Capital Flows, Consumption Booms and Asset Bubbles: A Behavioral Alternative to the Savings Glut Hypothesis,” NBER Working Paper 15759, 2010.

identified by Bernanke. Moreover, their model-based analysis suggests that countries receiving a significant capital inflow during the period should have experienced an investment boom; whereas investment in the United States did not increase significantly during the period. By contrast, consumption rose significantly, in concert with increased household wealth driven by a surge in house prices. While the saving glut hypothesis argues that increasing house prices are an effect of capital inflows, Laibson and Mollerstrom argue that house price bubbles in fact played a causal role in driving global imbalances. Their explanation does not provide an account of why house price bubbles occurred—as they acknowledge. More significantly, their explanation does not explain why bubbles should arise in so many countries at the same time.

To shed some light on this discussion, Figure 4.2 and Figure 4.3 show the evolution of key data series over the 1990–2010 period: the global savings rate, the U.S. current account balance, the federal funds rate, and longer-term interest rates on U.S. Treasury securities.²¹ The key argument behind the saving glut hypothesis is that long-term U.S. interest rates were low from the early 2000s onwards, thanks to a rapid increase in global savings, the source of the global liquidity boom. It is certainly true that global savings rates increased sharply between 2002 and 2007, from a trough of around 20.5 percent of global GDP to a peak of more than 24 percent. At the same time, long-term U.S. interest rates remained fairly low—the ten-year Treasury interest rate tops out at about 5 percent—despite a ramp-up in the policy rate to 5.25 percent (from a low of 1 percent) between mid-2004 and mid-2006. Could high global savings rates have been a factor preventing the long-term rate from responding more elastically to the policy tightening?

Looking at Figures 4.2 and 4.3, we see that the evidence is mixed. On one hand, the response of long-term interest rates seems consistent with a forward-looking bond market simply pricing in anticipated policy rate changes. Long-term interest rates are generally considered to be equal to the average of expected short-term interest rates over the same horizon plus a term premium, the additional compensation an investor gets for the risk of holding longer-term securities

21. The global savings rate comes from the IMF *World Economic Outlook*. It is calculated by the world savings divided by world GDP, all in USD. The U.S. current account and all the interest rates come from the St. Louis Federal Reserve Bank's FRED Database.

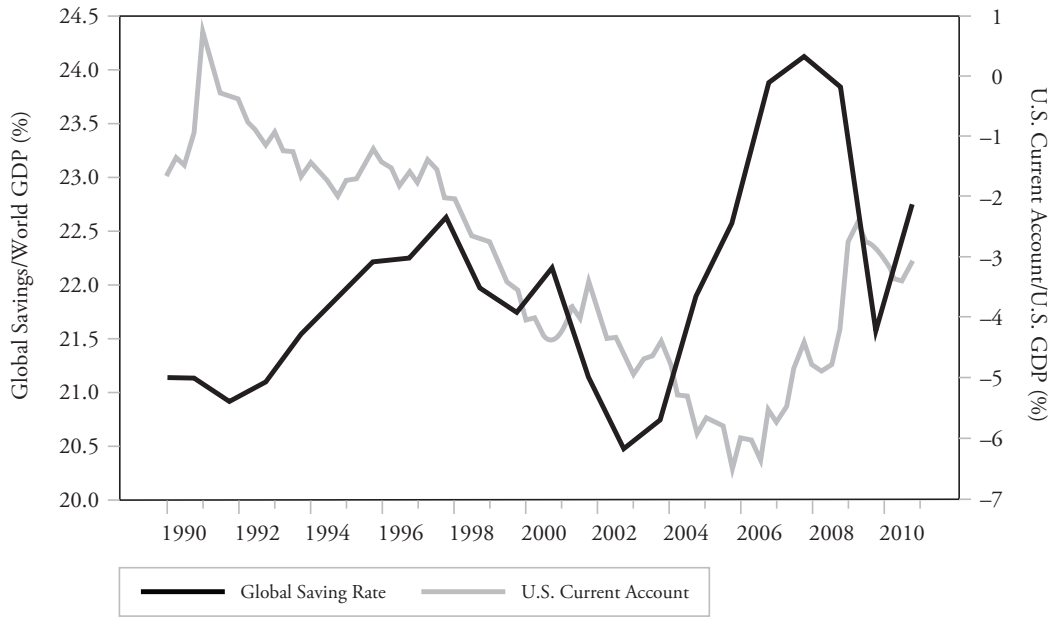


Figure 4.2. The Global Savings rate and the U.S. Current Account Balance
Source: IMF IFS Database, FRED Database, Authors' Calculations

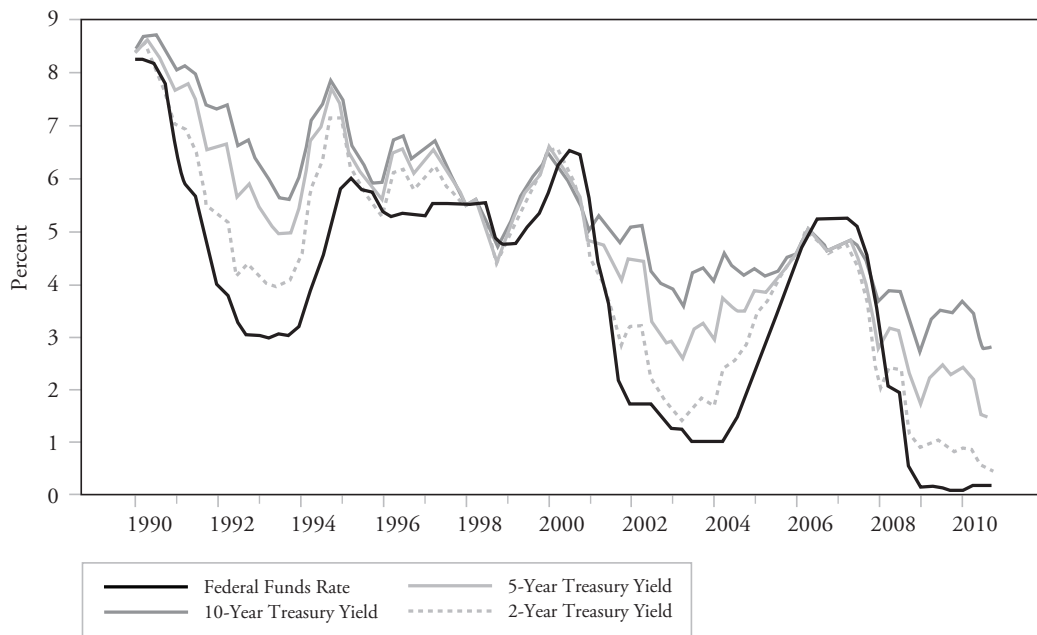


Figure 4.3. U.S. Interest Rates
Source: FRED Database

Thus, bond yields across the term structure increased by about 100 basis points between mid-2003 and mid-2004, *before* the Fed started its tightening cycle, as the bond markets anticipated a move away from the extraordinarily loose

policy stance that was maintained through mid-2004. In addition, the trough-to-peak increase in longer-term interest rates was not insignificant: the ten-year yield increased by 145 basis points, the five-year yield by 242 basis points, and one-year yield by 357 basis points. Compared to the 425-basis-point increase in the target federal funds rate, these changes seem reasonable given the linkages across the term structure of interest rates.

Still, Figure 4.3 indicates that long-term interest rates in 2005 and 2006 did not increase proportionally as much as they had in previous monetary policy tightening cycles. One explanation for this so called “interest rate conundrum” is that the bond market was once again pricing in expected policy rate changes. This time, however, it was pricing in policy rate cuts in anticipation of weakening in the U.S. economy. According to this view, the U.S. housing boom was headed for a bust, and the relatively low long-term interest rates were simply part of an inverting yield curve that signaled a recession was imminent.²²

An alternative interpretation for the “interest rate conundrum” is that the rise in global savings kept long-term interest relatively low during this time, especially in 2005 and 2006. For example, Bernanke argued that, among other things, the rise in global savings kept the demand for long-term U.S. Treasuries elevated and thus drove down the term premium.²³ Some studies that have estimated this effect have found that long-term interest rates were anywhere from 50 to 100 basis points lower than they otherwise would have been.²⁴ Figure 4.2 and Figure 4.3 do lend some support to these findings. They show that the rise in global savings does coincide with an increase in the U.S. current account deficit and a drop in U.S. long-term interest rates.

There are, however, problems with this story. First, though long-term interest rates do fall with the growth of global savings and the U.S. current

22. Mark Trumball, “Why That Cheap Home Loan May Signal Trouble Ahead,” *The Christian Science Monitor*, October 14, 2005; Paul Krugman, “Economic Storm Signals,” *New York Times*, December 1, 2006.

23. Ben Bernanke, “Reflections on the Yield Curve and Monetary Policy” (speech delivered to the Economic Club of New York, March, 2006).

24. Harm Bandholz, Jorg Clostermann, and Franz Seitz, “Explaining U.S. Bond Yield Conundrum,” *Applied Financial Economics* 19 (2009): 539–50; Rogger Craine and Vance L. Martin, “Interest Rate Conundrum,” *B.E. Journal of Macroeconomics* 9 (2009): 1–27; Francis Warnock and Veronica Warnock, “International Capital Flows and U.S. Interest Rates,” *Journal of International Money and Finance* 38 (2009): 903–19.

account deficit, they do so only through mid-2003. Thereafter, long-term interest rates *rise* even though the global savings and the U.S. current account deficits continue to grow. The only way to reconcile these facts with the saving glut hypothesis is to argue that after mid-2003 the rise in global saving caused long-term U.S. interest rates to rise to less than they otherwise would. Second, even if true, it does not rule out the possibility that the rise in global savings itself was the result of dollar-pegged economies acquiring vast sums of foreign exchange reserves to counteract the Federal Reserve's loose monetary policy. To maintain their dollar pegs at this time, these countries had to buy up dollars and sell their currencies. This kept their currencies undervalued, raised the price of domestic consumption, and ultimately led to a higher savings rate. The saving glut, then, may have been a by-product of loose U.S. monetary policy working through dollar-pegged exchange rate regimes.

To the extent the saving glut did matter, we believe the recycling of U.S. monetary policy interpretation to be the best explanation for it. More generally, we believe the global liquidity boom and the coordinated appearance of housing booms across a wide range of economies can be traced back to U.S. monetary policy shocks being transmitted to other economies. In addition to the recycling of U.S. monetary policy, the channels of transmission include direct market effects, as lower U.S. interest rates drove down yields in other markets, as well as policy transmission, as other central banks followed the Fed in loosening policy. Our view is that the Federal Reserve, alone among central banks, has the ability to determine global monetary conditions. This is not to deny that other central banks have some limited room for independent policy action. For instance, central banks can choose to intervene in foreign exchange markets in order to fix the value of the domestic currency, and in some cases this likely exacerbated the pattern of global imbalances.²⁵ However, as we argue in the next section, the Federal Reserve exerts a disproportionate influence over global monetary conditions. Thus, the Fed policy decisions can explain the simultaneous appearance of a global liquidity boom and house price booms across a wide range of economies. Moreover, the Fed's status as

25. Although in this case, the central bank in question also surrenders whatever autonomy it might have to set monetary policy independently (unless it also maintains effective capital controls, as in the case of China, but probably few other emerging markets).

a monetary “superpower” makes the saving glut hypothesis—in which the U.S. monetary authorities act as passive bystanders overwhelmed by global forces beyond their control—an implausible explanation of global imbalances.

The Monetary Superpower Hypothesis

We believe the most convincing explanation for the global liquidity boom is what we call the “monetary superpower hypothesis.” This understanding holds that the Federal Reserve is a monetary superpower capable of shaping global liquidity conditions. Given this power, the Federal Reserve’s unusually accommodative monetary policy during the early-to-mid 2000s created a global liquidity boom and the related buildup of economic imbalances. The idea that the Federal Reserve can influence global liquidity is not new. Many studies have shown that U.S. monetary policy can affect monetary conditions and interest rates across the world.²⁶ Federal Reserve officials have acknowledged as much. Federal Reserve Vice Chair Janet Yellen, for example, in 2010 reports the following from a 2009 fact-finding trip to Asia:

For all practical purposes, Hong Kong delegated the determination of its monetary policy to the Federal Reserve through its unilateral decision in 1983 to peg the Hong Kong dollar to the U.S. dollar. . . . As in Hong Kong, Chinese officials are concerned about unwanted stimulus from excessively expansionary policies of the Fed. . . . Overall, we encountered concerns about U.S. monetary policy, and considerable interest in understanding the Federal Reserve’s exit strategy for removing monetary stimulus. Because both the Chinese and Hong Kong economies are further along in their recovery phases than the U.S. economy, current U.S. monetary policy is likely to be excessively stimulatory for them.²⁷

26. See, for example, Soyoung Kim, “International Transmission of U.S. Monetary Policy Shocks: Evidence from VAR’s,” *Journal of Monetary Economics* 48 (2001): 339–72; Ansgar Belke and Walter Orth, “Global Excess Liquidity and House Prices: A VAR Analysis for OECD Countries” (Ruhr Economic Paper No. 37, 2007); Carmassi, et al., “The Global Financial Crisis.”

27. Janet Yellen was president of the San Francisco Federal Reserve Bank at this time. As president, though, she was still an influential Federal Reserve official.

Federal Reserve Chairman Ben Bernanke similarly acknowledged the global influence of U.S. monetary policy in a 2011 speech.²⁸ While there is this recognition of the Federal Reserve's power, no study or U.S. monetary official has documented the extent of it or followed it through to its logical conclusion. Here we do that by explaining why the Federal Reserve is a monetary superpower, by showing how extensive its global influence is, and by connecting it to the global liquidity boom.

The Federal Reserve's superpower status comes from the fact that it manages the main reserve currency of the world to which many countries either explicitly or implicitly peg their currency. By pegging to the dollar, these countries give up their monetary policy autonomy and allow their domestic monetary conditions to be set by U.S. monetary authorities. Because of its influence on these dollar-pegged countries, the Federal Reserve also will influence to some extent monetary policy in Japan and the Eurozone. To see this, consider what would happen if the Federal Reserve were to lower interest rates. This easing of U.S. monetary policy would be transmitted to the dollar-peggers, causing their currencies, along with the U.S. dollar, to depreciate relative to the yen and the euro. As we show below, the dollar-bloc countries are a large portion of the global economy. Therefore, the Bank of Japan and the European Central Bank (ECB) could not afford to ignore such a development. At some point, they too would ease monetary policy to prevent their currencies from getting too expensive against the dollar-bloc currencies. Thus, they would effectively adopt U.S. monetary policy too.

That is the story, but does the evidence support it? Figure 4.4 shows just how big the dollar-bloc countries are as a percent of world GDP. Using PPP-adjusted values, this figure shows that those countries that use or are linked to the U.S. dollar make up about 40 percent of world GDP. By comparison, the European Central Bank (ECB) makes up about 18 percent, and the Bank of Japan approximately 7 percent. The only real contender, then, with the

28. His recognition is more implicit in that he responds to critics who say U.S. monetary policy is exported to emerging markets not by disagreeing but by arguing that the emerging markets should adjust their exchange rate regimes and macroeconomic policies to prevent this from becoming a problem. In other words, Bernanke is saying "Yes, our monetary policy is affecting you, but that is your problem to fix."

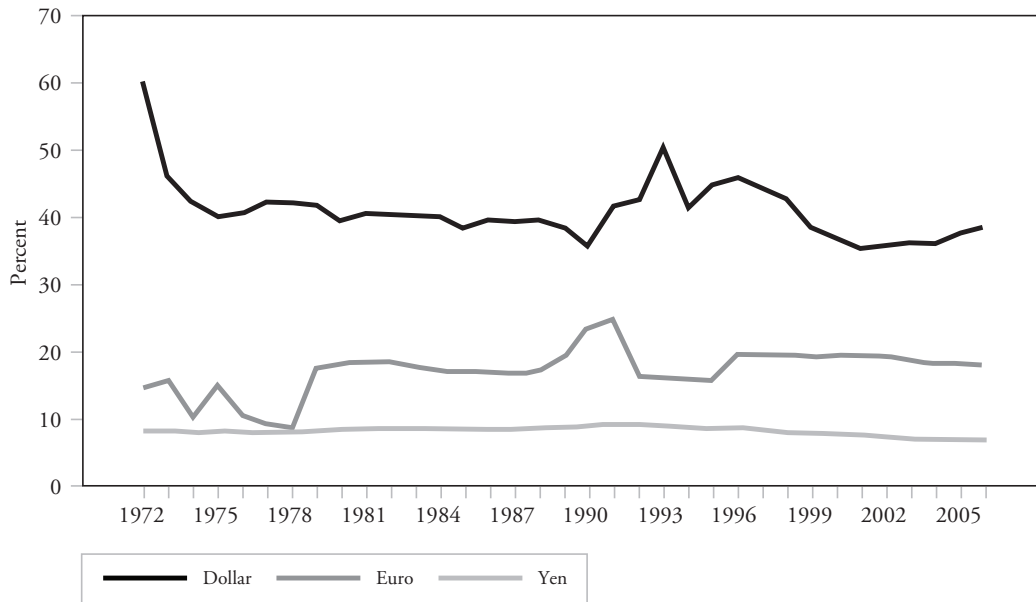


Figure 4.4. PPP Share of World GDP

Source: IFS Database, Authors' Calculations

Federal Reserve in terms of influence is the ECB. However, because the dollar-bloc share of world GDP is so relatively large, the ECB is also influenced by U.S. monetary policy. As we demonstrate shortly, there is strong evidence that Fed policy influences the monetary environment in the Eurozone, with no evidence of any influence in the opposite direction. Thus, these numbers understate the true influence that the Federal Reserve has on global monetary conditions.

Figures 4.5 and 4.6 and Table 4.1 indicate just how much influence the Federal Reserve has on the ECB. Figure 4.5 shows the target policy interest rate for both central banks.²⁹ It shows that since its inception in 1999, the ECB has consistently followed policy interest rate changes by the Federal Reserve with a lag (the ECB decided to start hiking rates in April 2011, while the Fed maintained its easing stance, being a recent exception). Figure 4.6 shows that not only were target policy interest rates alike, but also the extent of excessive easing or tightening by ECB was also very similar to the Federal Reserve during

29. The policy interest rates are the federal funds rate for the Federal Reserve and the deposit facility rate for the ECB.

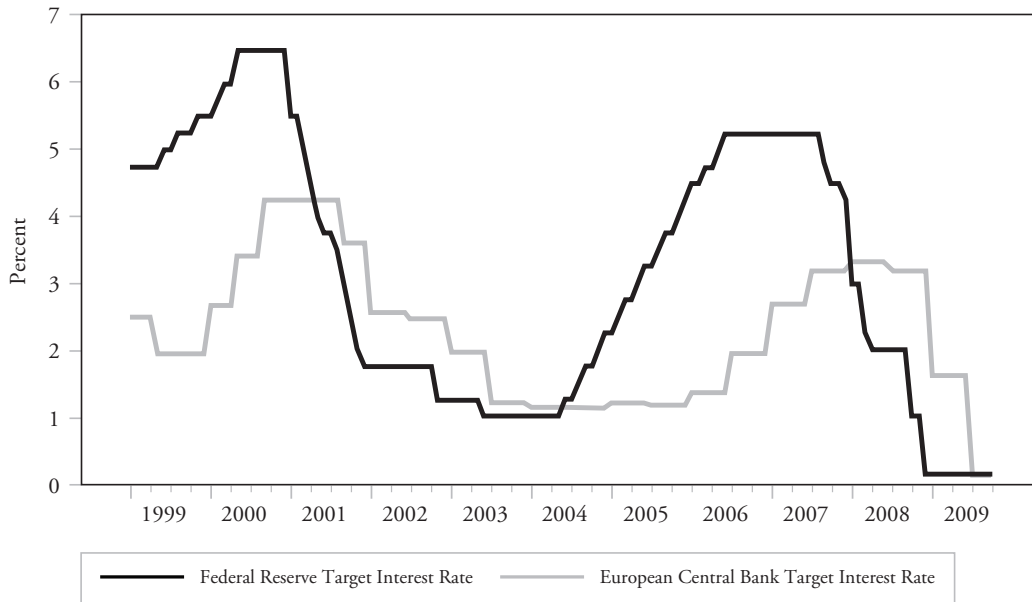


Figure 4.5. Follow the Leader

Source: FRED Database, Eurostat Database, Authors' Calculations

this time.³⁰ This figure shows how much each central bank's target interest rate deviated from that prescribed by a standard Taylor Rule—the Taylor Rule Gap.³¹ The Taylor Rule prescribes what the policy interest rate should be given the state of economy. Any deviation from the Taylor Rule can be

30. John B. Taylor notices this relationship too. Like us, he makes the case that the Federal Reserve's policies probably influenced the ECB. See John B. Taylor, *Getting Off Track: How Government Actions and Interventions Caused, Prolonged, and Worsened the Financial Crisis* (Stanford, CA: Hoover Institution Press, 2009).

31. The Taylor Rule is defined as follows: $i_t^* = i_t^n = 0.5(y_t - y_t^p) + 0.5(\pi_t + \pi^*)$, where i_t^* is the target nominal federal funds target, i_t^n is the neutral federal funds rate and consist of the real neutral federal funds rate, r_t^n , and the inflation target, π_t . In both cases, the neutral real interest rate is set to 2 percent and the target inflation rate is 2 percent. This is standard for the U.S. Taylor Rule. According to Garnier and Wilhelmsen, it is also a reasonable approximation for the ECB. (See Julien Garnier and Bjorn-Roger Wilhelmsen, "The Natural Real Interest Rate and the Output Gap in the Euro Area: A Joint Estimation" (European Central Bank Working Paper 546, 2005). For the output gap we use the percent deviation of industrial production from its trend for the ECB, while for the Federal Reserve we use the Laubach and Williams output gap estimate. (See Thomas Laubach and John Williams, "Measuring the Natural Rate of Interest" *Review of Economic and Statistics* 85 (2003): 1063–70. Finally, for the ECB we use the harmonized CPI index from the OECD, while for the Federal Reserve we use the CPI.

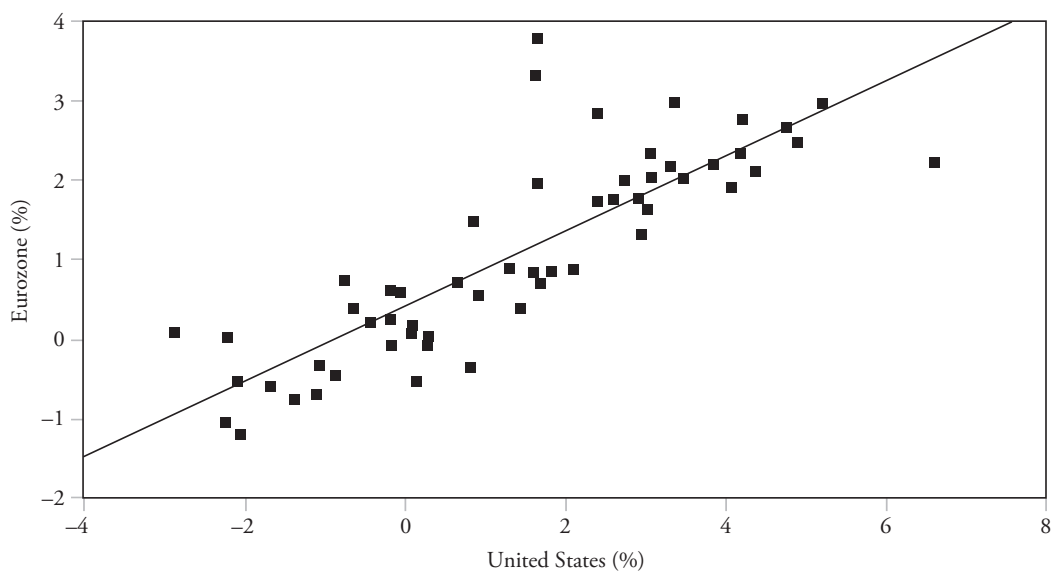


Figure 4.6. Taylor Rule Gaps 1997:Q1–2010:Q4

Source: FRED Database, Eurostat Database, Authors' Calculations

Table 4.1

	The Federal Reserve U.S. Monetary Policy Shocks Do Not Granger Cause 1-Month Euribor Rate	The European Bank European Monetary Policy Shocks Do Not Granger Cause the Federal Funds Rate
Lags	P-Value	P-Value
1	0.283	0.989
2	0.015	0.833
3	0.031	0.121
4	0.003	0.335
5	0.013	0.430
6	0.025	0.457
7	0.040	0.467
8	0.136	0.599
9	0.260	0.673
10	0.208	0.747
11	0.139	0.475
12	0.202	0.523
13	0.025	0.613
14	0.060	0.231
15	0.007	0.315
16	0.015	0.369
17	0.008	0.422
18	0.002	0.470

viewed as monetary policy easing or tightening not warranted by economic conditions. Remarkably, the deviations are very similar.

It could be that these similarities are due to the Federal Reserve and the ECB responding to developments that affect them both, rather than the Federal Reserve independently driving changes in the ECB. To check this possibility, we use the Barakchian and Crowe monetary policy shock measures³² to determine whether truly exogenous changes in U.S. monetary policy—changes that cannot be explained by other developments—affected short-term market interest rates in the Eurozone during this time. Likewise, we check whether such exogenous changes in ECB monetary policy influenced short-term market interest rates in the United States.³³ To do this, we run Granger causality tests that assess whether the monetary policy shocks can improve upon forecasts of the short-term market interest rates that rely only on lagged values of the short-term interest rates. Table 4.1 reports the results of this exercise using monthly data for the period 1992:2–2010:2. Various lag lengths are used to be robust.³⁴ Here, the null hypothesis is that the monetary policy shocks do not “Granger” cause changes in the other region’s short-term interest rates. A rejection of this null—a p value of less than 0.10—indicates that the monetary policy shocks may be causing changes in the other regions’ short-term interest rates.

Consistent with the monetary superpower hypothesis, Table 4.1 reveals that U.S. monetary policy shocks do influence Eurozone short-term interest rates, while Eurozone monetary policy shocks do not influence U.S. short-term interest rates.³⁵ U.S. monetary policy, then, truly was influencing monetary policy in the Eurozone. Figure 4.7 shows its influence was significant: for the Eurozone, up to 56 percent of the short-term interest rate forecast error and up

32. Syed Barakchian and Christopher Crowe, (IMF Working Papers 10/230, 2010).

33. The Barakchian and Crowe shock measures are constructed using futures contracts on short-term interest rates targeted by the central banks. (For details, see Barakchian and Crowe, “Monetary Policy Matters.”)

34. Following Barakchian and Crowe, the shock series is accumulated into levels and the interest rate data is not first differenced to account for the possibility of cointegration. A vector autoregression is used to estimate the relationship. See Barakchian and Crowe, “Monetary Policy Matters.”

35. Similar results are found in Ansgur Belke and Daniel Gros, “Asymmetries in Transatlantic Monetary Policy-making: Does the ECB Follow the Fed?” *Journal of Common Market Studies* 43 (2005): 921–46.

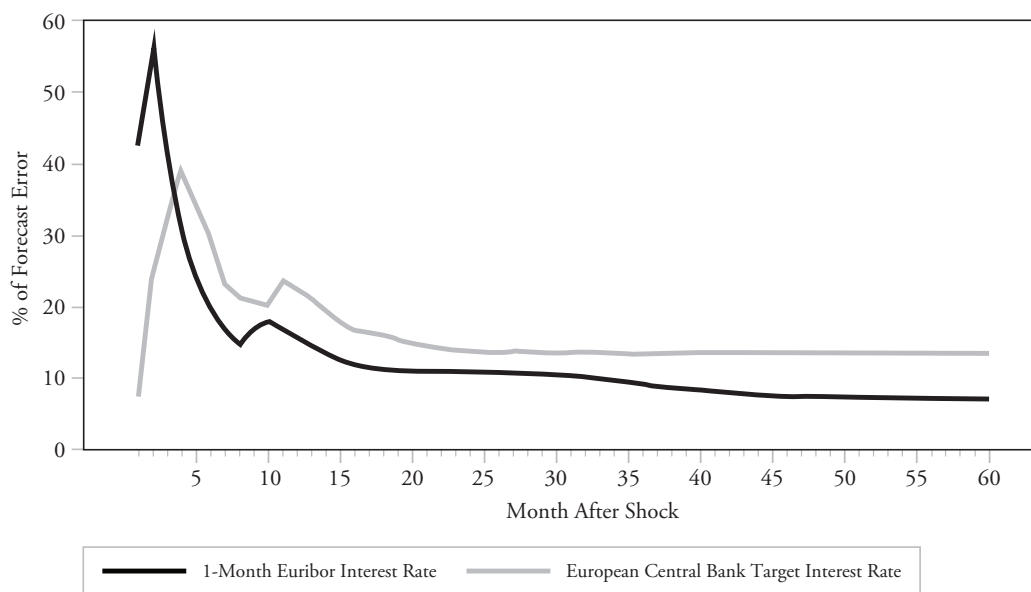


Figure 4.7. Forecast Error Explained by U.S. Monetary Policy Shocks

Source: Eurostat Database, Authors' Calculations

to about 40 percent of the policy interest rate forecast error can be explained by U.S. monetary policy shocks. This figure indicates that the Federal Reserve accounts for a sizable share of the non-predicted movement in short-term interest rates in the Eurozone.³⁶

Since the Federal Reserve controls monetary policy for the dollar-bloc region and heavily influences monetary policy in the Eurozone, as shown above, its influence must be felt across the global economy. Figure 4.8 shows that, in fact, this is the case. This figure reveals that for the 1999–2009 period, the Federal Reserve's target policy interest rate helped shape short-term interest rates throughout the world.³⁷ Generally, the target federal funds rate led these other short-term interest rates. The only notable exception is China before

36. The forecast errors come from a vector autoregression of 13 lags that includes the interest rates and the U.S. monetary policy shocks.

37. The oil-exporting countries are Saudi Arabia, Kuwait, Bahrain, Qatar, Oman, and Norway. The emerging market asia countries are Singapore, South Korea, Hong Kong, Thailand, Philippines, Malaysia, and Taiwan. A GDP-weighted average of each country's short-term interest rate was used to construct the regional short-term interest rate. For each country the shortest interest rate available was used. The data sources include the IMF's International Financial Statistics database, the OECD's online database, and in some cases central bank websites.

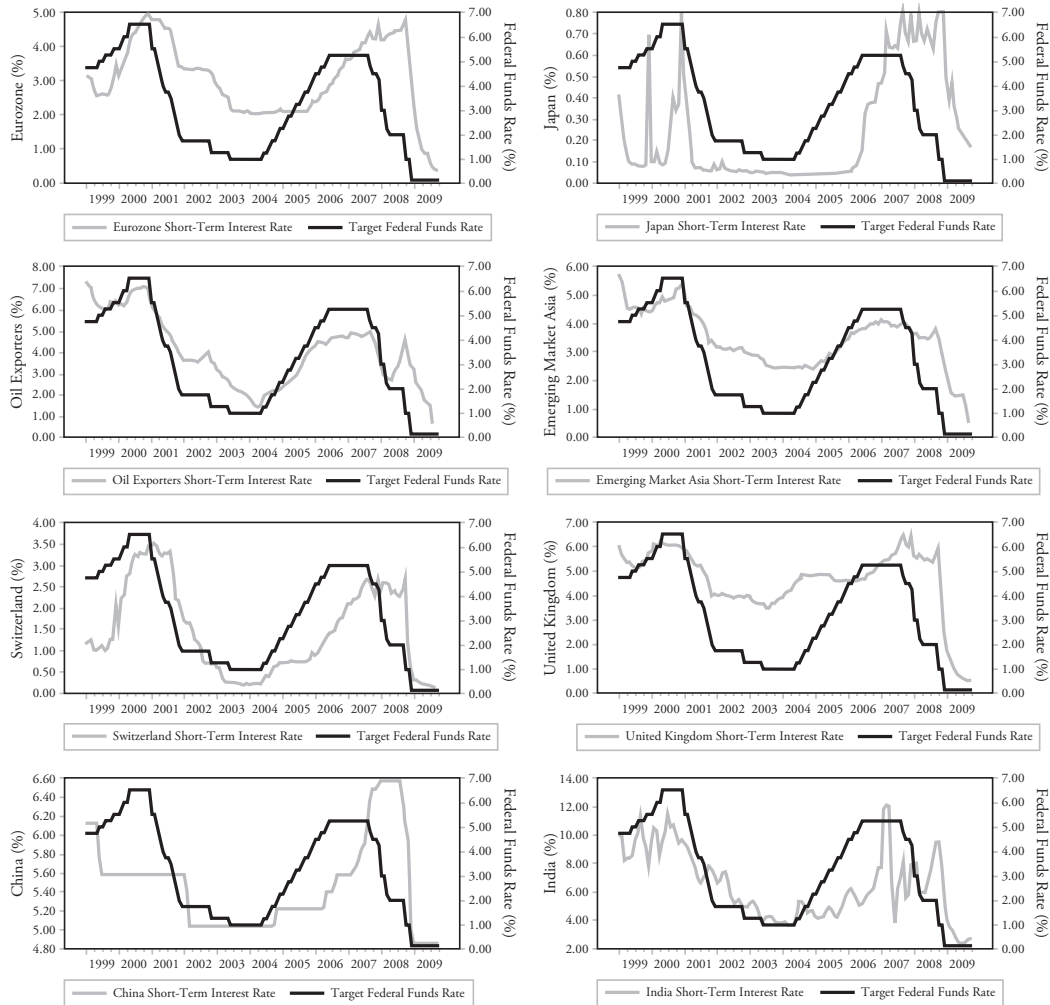


Figure 4.8. Let's All Follow the Leader

Source: OECD database, Eurostat Database, FRED Database, IMF IFS Database, Authors' Calculations

2002. This exception, however, reflects the fact that China did not enter the WTO (World Trade Organization) until 2001. After its entry, the Chinese short-term interest rate does follow the target federal funds rate with a lag. The Federal Reserve is indeed a monetary superpower.

The monetary superpower hypothesis claims not only that the Federal Reserve is a monetary superpower, but also that because of its unusually accommodative monetary policy in the early-to-mid 2000s, it created a global liquidity boom and the related economic imbalances. A key part of this story is that the dollar-pegging countries had to acquire vast sums of foreign exchange

reserves to counteract the loosening of U.S. monetary policy. This buildup of foreign exchange reserves, in turn, got recycled back to the United States as these countries bought up U.S. securities. This increased the demand for safe U.S. assets and put downward pressure on long-term interest rates. For this story to hold, then, it must be established that the loose U.S. monetary policy was closely tied to buildup of foreign exchange reserves during this time.

Figure 4.9 shows that there is, in fact, a close relationship between the stance of U.S. monetary policy and the growth of foreign exchange reserves. This figure plots the Taylor Rule gap used in Figure 4.6 against the year-on-year growth rate of foreign exchange reserves. The R^2 between these two series is just under 50 percent for the entire period. For the period up through the end of the housing boom in 2006, the R^2 is 63 percent. A positive value for the Taylor Gap means monetary policy is excessively loose. Thus, the 2002–2004 easing by the Fed was excessive and matched by a sharp increase in the growth of foreign exchange reserves.

Figure 4.10 completes the story by showing that the Taylor Gap was also systematically related to the related buildup of economic imbalances associated with the global liquidity boom. Here we see that the U.S. current account deficit, the amount of global debt securities, the growth of the OECD real housing price index, and global nominal spending are all closely related to the Federal Reserve's easy monetary policy at this time.³⁸ Given the Federal Reserve's monetary superpower status, the easiest interpretation for these scatter plots is that the Federal Reserve's monetary policy created a global liquidity boom that led to the growth of these imbalances. Other studies have come to similar conclusions.³⁹

38. The global nominal spending shock is calculated as the difference between the year-on-year growth rate of global nominal GDP and a rolling ten-year average of the year-on-year global nominal GDP growth rate. The idea here is that the ten-year rolling average provides a forecast for the current global nominal GDP growth rate. Any deviation from that forecast is a shock.

39. Gros et al., "A World Out of Balance?"; Bracke and Fidora, "Global Liquidity Glut or Global Savings Glut?"; Carmassi et al., "The Global Financial Crisis"; Obstfeld and Rogoff, "Global Imbalances and the Financial Crisis"; Vermeiren, "The Global Imbalances and the Contradictions of U.S. Monetary Hegemony."

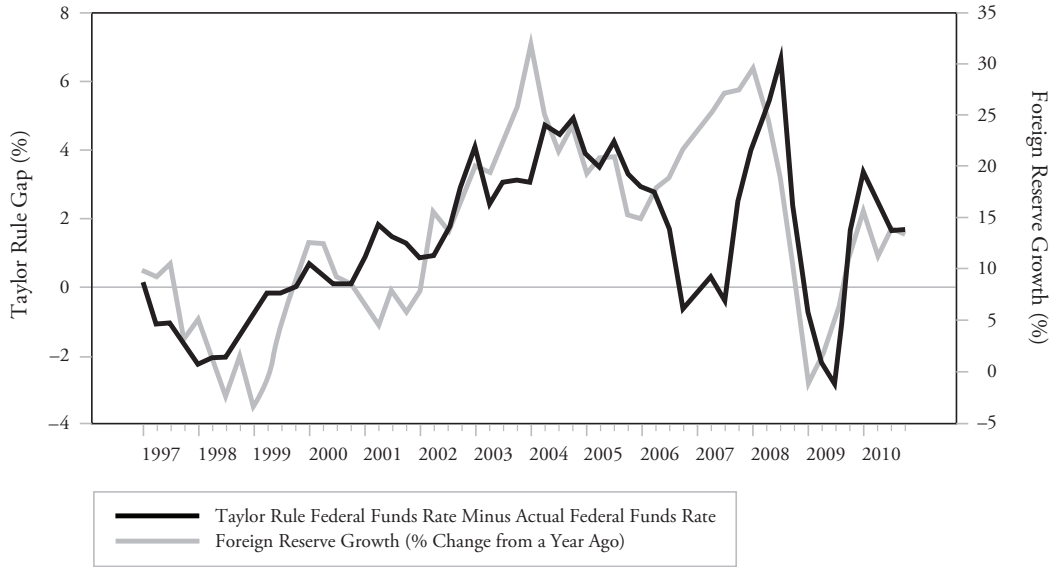


Figure 4.9. U.S. Monetary Policy and the Growth of Foreign Reserves

Source: IMF IFS Database, FRED Database, Authors' Calculations

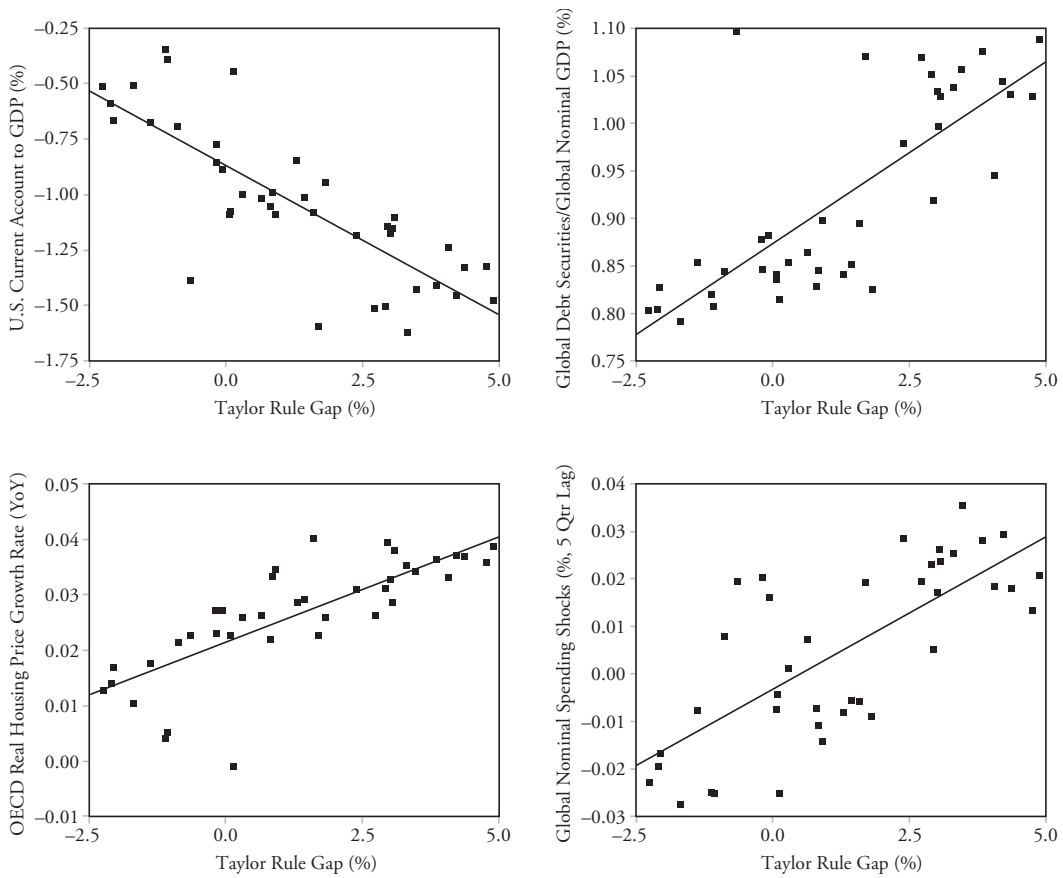


Figure 4.10. U.S. Monetary Policy and Global Economic Imbalances

1997:Q1–2006:Q4

Source: IMF IFS Database, FRED Database, BIS database, Authors' Calculations

An important implication of these findings is that the transformation of risky assets into supposedly safe AAA-rated securities during this time was, in part, a byproduct of recycled loose U.S. monetary policy. Bernanke et al. in a 2011 paper show that because the dollar-pegged countries were acquiring most of the traditional safe assets, U.S. Treasury and GSE securities, the remaining demand for safe U.S. securities was met by structured finance creating safe assets out of risky ones.⁴⁰ Had U.S. monetary policy been less accommodative, there would have been less demand for safe assets by these countries and thus, less need for structured finance to work its magic. Tighter monetary policy would have reduced the demand for safe assets in other ways too. First, many fixed-income investors such as pension funds and insurance companies have fixed nominal return targets. The Federal Reserve's low interest rate policy at this time made it difficult for them to meet their targeted nominal return. Consequently, there was a "search for yield" by these investors that led them to look for other safe, but higher-yielding assets. Second, the lower interest rates also created the incentive for other investors like hedge funds and broker-dealers to borrow at low funding rates and then invest in safe, higher-yielding assets. Both types of investors increased the demand for safe assets and that was met by transforming risky assets into safe ones.⁴¹ The Federal Reserve, thus, increased the demand for safe assets from foreign and domestic investors alike.

The evidence presented above strongly suggests that the Federal Reserve through its influence on global monetary conditions created a global liquidity boom in the early-to-mid 2000s that fueled the rise of global economic imbalances. What appeared to be a global saving glut to some was actually the global recycling of loose monetary policy from the world's monetary superpower. The policy implications of the Federal Reserve's monetary superpower status are considered next.

40. Ben Bernanke, Carol Bertaut, Laurie Pounder Demarco, and Steven Kamin, "International Capital Flows and the Returns to Safe Assets in the United States, 2003–2007" (Federal Reserve Board of Governors, International Finance Discussion Paper, 2011), 1014.

41. Tobias Adrian and Hyun Song Shin, "Liquidity, Monetary Policy, and Financial Cycles," Federal Reserve Bank of New York, *Current Issues in Economics and Finance* 14, no. 1 (2008); L. Gambacorta, "Monetary Policy and the Risk-Taking Channel," *BIS Quarterly Review*, December, 2009, 43–53; Diego Espinosa, "Chain Reaction: How the Fed's Assymmetric Policy in 2003 Led to a Panic in 2008," Chapter 3 in this volume, *Boom and Bust Banking* (Oakland, CA: The Independent Institute, 2012).

Policy Implications

The main policy implication of the monetary superpower hypothesis is that the Federal Reserve needs to be more cognizant of its global economic influence. In particular, when making monetary policy decisions, the Federal Reserve needs to take into account that its actions get amplified into broader global liquidity conditions. Thus, in the early-to-mid 2000s, the Federal Reserve's sustained easing of monetary policy created a global liquidity boom that put the global economy on an unsustainable path. Likewise, in mid-to-late 2008, as global financial conditions were worsening, the demand for the main reserve currency of the world spiked. The Federal Reserve, however, was slow to respond to this dollar demand shock. This allowed global output to contract more than it probably otherwise would have. Being more cognizant of its global influence is not easy for the Federal Reserve, given its domestic mandate. Still, the understanding that U.S. monetary policy can influence global liquidity conditions, which can in turn affect the U.S. economy, should give the Fed pause. It is in the Federal Reserve's self-interest to pay closer attention to the international dimension of its role as a monetary superpower.

What makes the Federal Reserve a monetary superpower is the fact that numerous countries peg their currency to the one that the Federal Reserve controls. These countries do so because the dollar is the currency of the largest economy in the world with the deepest financial system. The Federal Reserve cannot control this decision by these dollar-pegging countries. It can, however, respond more forcefully to domestic economic conditions and, by doing so, better manage its influence on global monetary conditions. For example, had the Federal Reserve tightened faster during the U.S. housing boom, it would have also reined in global liquidity conditions. Similarly, had the Federal Reserve responded more quickly to the weakening U.S. economy where the financial crisis started, then the global financial crisis would have been less severe and the global dollar demand shock would have been muted.

This is not to say that monetary policy that is best for the U.S. economy will always be best for the global economy, as many emerging economies learned in 2010. During this time, the U.S. economy languished while the emerging economies were experiencing rapid growth. The Federal Reserve, as a consequence, began a large monetary stimulus program called QE2. Though argu-

ably appropriate for the U.S. economy, it was way too accommodative for the dollar-pegged emerging economies. Not wanting to let their currencies rapidly appreciate against the dollar, and not being able to sterilize all of the related capital inflows, these economies found QE2 to be too stimulative and inflationary for them. Still, they chose to maintain their link to the dollar.

Barry Eichengreen predicts that eventually the dollar will lose its reserve currency status and become one of three important global currencies.⁴² When that happens, the Federal Reserve's monetary superpower status will diminish too. Though that time appears far off, there are some signs that could be viewed as moving the global economy in that direction. First, because of QE2, the dollar-pegged economies are losing their export competitiveness. As noted above, these countries are getting higher-than-desired inflation with QE2. This is making their exports more expensive and defeating the very purpose of linking cheaply to the dollar. If U.S. monetary policy continues to be too easy for them, over time it might make them less eager to peg to the dollar. Second, the ECB in early 2011 chose to begin raising its target interest rate. If it follows through, then the ECB may be finally moving out of the Federal Reserve's orbit of influence. Though interesting, these developments may prove inconsequential for the Federal Reserve monetary superpower status. For the emerging economies still need the U.S. economy to buy their goods, and it is an open question as to whether the ECB can really allow the Euro to strengthen too much against the dollar.

What is sure is that for now, the Federal Reserve is a monetary superpower. It will continue to influence global monetary conditions and influence economies far beyond its domestic mandate. Therefore, it is time for Federal Reserve officials to acknowledge this monetary superpower status and act accordingly.

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