

## LIMITS OF MONETARY POLICY IN THEORY AND PRACTICE

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The Federal Reserve's conduct of monetary policy casts a spell over market participants, commentators, and academics. The pages of financial newspapers parse subtle differences among the comments of Fed officials and delve deeply into potentially multiple meanings of official statements. Academic discussions argue that the path of the policy rate may (as in Taylor 2009) or may not (as in Bernanke 2010, and Greenspan 2010) have fueled a home-price bubble in the United States.

The view that modest alterations to monetary policy have vast consequences for national economies would seem to be inconsistent with theory and evidence. Most modern economic models (represented authoritatively by Woodford 2005) offer limited scope for policy surprises. The basic logic is that spending depends on decisions capitalized over the longer term, and small perturbations in the level of the short-term interest rate do not matter much to those values. More fundamentally, the prominence accorded to authorities controlling nominal magnitudes seems to undervalue the resilience of market economies, which are supposed to be efficient in grinding out appropriate relative prices so as to employ resources efficiently. In other words, if central bankers are crucial to moderating the operations of capitalist economies, then capitalist economies may have serious drawbacks.

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We will argue that this fascination with the Fed is also at odds with the evidence by taking a close look at the responses of asset markets to changes in the short-term interest rate since the founding of the Fed in 1914. In fact, there are no apparent effects on either long-term interest rates or housing prices. We will also show that the policy rate more recently had no systematic relationship with long-term interest rates. A global view of capital markets casts doubt on those arguing that a different policy path might have crucially mattered.

The conclusion is similarly wary of outsized expectations of monetary policymakers and explains why pride goes before a fall.

Saying that modest changes in monetary policy would not matter much does not imply that monetary policymakers are irrelevant. They can do great ill by losing the story line and forgetting their role in providing a stable backdrop of price stability. Small mistakes also cumulate. Monetary policy was probably too easy from 2002 to 2006. It was also too predictable, encouraging a short-termism in financial markets, and was not sensitive to the dangers posed by a buildup of credit. But were we able to walk back the path that the world took, changes to supervision and regulation would most likely loom larger still in shaping economic outcomes in the 2000s.

## Limits of Monetary Policy in Theory

Two properties of most macroeconomic models are especially relevant to the conduct of monetary policy. First, spending and pricing decisions are assumed to be based on long-term assessments of real income and real rates of return. Second, changes in monetary policy can change real interest rates only temporarily. Ultimately, the forces of productivity and thrift determine them, not changes in nominal magnitudes on the central bank balance sheet.<sup>1</sup> Combining the two propositions implies that the Federal Reserve's interest rate policy, as long as it stays within the narrow range of experience, would not be expected to have a significant or long-lasting imprint on markets or activity.

John Taylor (2009), among others, demurs in that view. In particular, the Federal Reserve is held to have systematically run policy too

<sup>1</sup>Obviously, this is a source of debate among economists. We follow the textbook presentation along the lines of Woodford (2005) in which monetary policy has little if any, long lasting effect on real variables. Akerlof and Shiller (2009) provide a stark counterpoint by emphasizing confidence effects and market irrationality.

loose from around 2002 to 2006, which encouraged the housing boom and the related financial market excesses. However, the deviations from Taylor's preferred policy were modest. Such sensitivity of outcomes to those misses is hard to square with the propositions that the Fed can only keep the short-term real interest rate low for a limited time and that it is long-term values that matter.

An example can make the point clearer. Finance theory posits that a capital asset is valued as the present value of expected future income. Such assets include homes, long-term government and corporate debt instruments, and durable goods, but stock prices are the simplest to model (as explained in Shiller 1989). With equities, the income comes in the form of dividends, and the discount factor is the real short-term interest rate plus a risk premium. According to the long-time series already used and as shown in Table 1, from 1914 to 2006, the real one-year risk free rate (using the one-year Treasury rate less the year-ahead percent change in consumer prices as the proxy) averaged 1.27 percent, equities gave a return in excess of that of 7.11 percent, and real dividends expanded 1.85 percent per annum. Calculating the present value of equities at those historical averages is straightforward.

The entries of Table 1 assess how those present values change if the real interest rate were 1 percentage point higher than its long-term average. A permanent increase in real rates has a powerful negative effect on capitalized values, ranging from  $-13.3$  percent (if the equity premium matched its average) to  $-78.4$  percent (if the equity premium were zero). It is results such as these that create the perception that the Fed has a powerful lever on the economy.

But the prior from theory is that the Fed's ability to raise *real* interest rates is fleeting, at best. As is evident, tighter policy that succeeded in raising real rates for as long as three years would reduce the capital value of assets by only 1 to 3 percent. To view that modest change as a source of policy leverage that could have significantly influenced events of the past few years is to assume that the economy is not well anchored by real phenomena.

### Limits of Monetary Policy in Practice

If the Federal Reserve served a critical role in stabilizing the economy, then presumably it should leave a systematic imprint in financial markets. The data from Shiller (1989 and 2005) provide a helpful

TABLE 1  
IMPACT OF CHANGES IN REAL INTEREST RATES ON  
PRESENT VALUES

Years for which the real short-term interest rate is held 1 percentage point higher	Change in Present Value (%)		
	Equity premium* is assumed to be:		
	Average 1914–2006	One-half the average	Zero
1	–0.9	–0.9	–1.0
2	–1.8	–1.9	–1.9
3	–2.6	–2.7	–2.9
4	–3.3	–3.6	–3.8
5	–4.0	–4.4	–4.8
10	–6.8	–8.0	–9.3
permanent	–13.3	–25.1	–78.4

Average from 1914 to 2006 (%)	
Real short-term interest rate	1.27
Real growth of dividends	1.85
Dividend/price ratio	4.46
Equity premium*	7.11

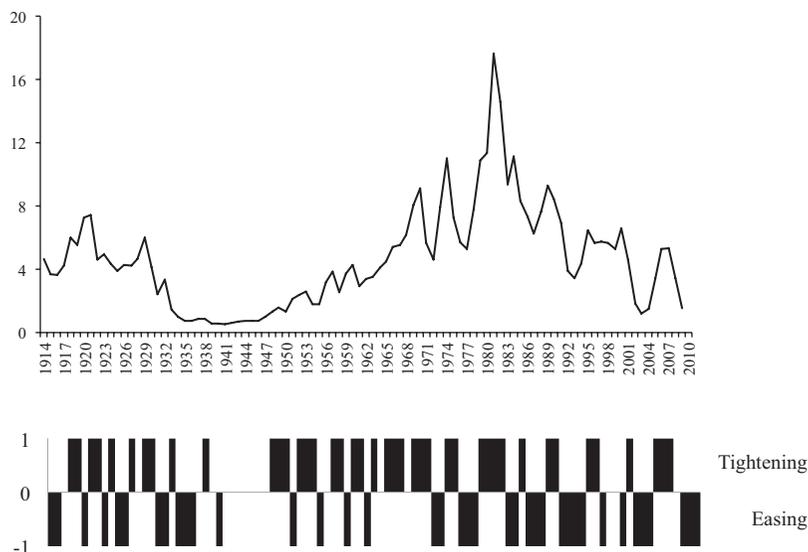
\*Equity premium is the short-term real return on equity minus the real short-term interest rate.

SOURCE: Shiller (1989, 2005) and authors' calculations.

resource for testing this proposition, giving long time series on Treasury yields, equity and house prices, and consumer prices. Figure 1, from the Shiller dataset, plots annual observations on the 1-year Treasury rate over the existence of the Federal Reserve, from 1914 to 2010.

We coded these observations, with year-on-year increases of more than 0.25 percentage point representing a tightening, decreases of more than 0.25 percentage point representing an easing, and variations in the 0.50 percentage point range bracketing zero representing no change. The bars in the lower part of Figure 1 show the results, with the top bars corresponding to tightening and the bottom

FIGURE 1  
FEDERAL RESERVE POLICY STANCE, 1914–2010  
(NOMINAL 1-YEAR TREASURY RATE, PERCENT)



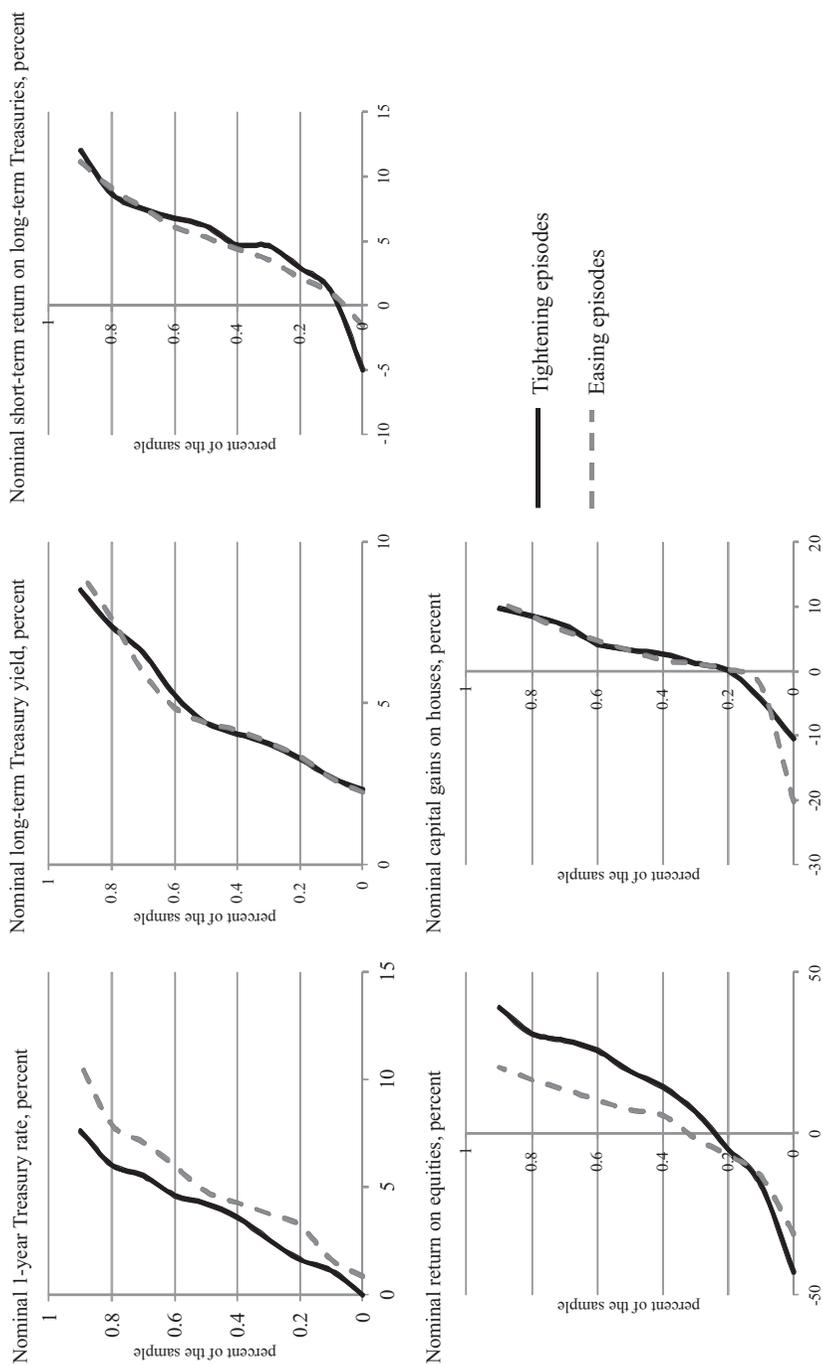
SOURCE: Shiller (1989, 2005; updated).

bars to easing of monetary policy. This simple rule accords surprisingly well with narrative information of policy decisions. For instance, the dating from Federal Reserve correspondence of the tightening cycle from 1988 to 1992 in Reinhart and Simin (1997) matches the rule-based characterization. There are about an equal number of easing and tightening episodes (20 of the former and 21 of the latter), which also about split up equally the years of the Fed's existence. In about one-fifth of the years, the policy stance did not differ materially from the year before.<sup>2</sup>

The five panels of Figure 2 show the cumulative frequency distributions over the tightening and easing policy stances for nominal short- and long-term yields and the 1-year realized nominal returns on long-term Treasuries, the S&P 500 Composite equity

<sup>2</sup>An alternative identification scheme is to code unchanged years as a continuation of the prior stance. Nothing that follows would change had we adopted that rule.

FIGURE 2  
MARKET RESPONSE TO THE FEDERAL RESERVE'S POLICY STANCE, 1914-2010



SOURCE: Shiller (1989, 2005; updated).

index, and home prices.<sup>3</sup> As is evident and reassuring to the policy identification strategy, the tightening regimes (the solid lines) are associated with a higher short-term rate than the easing regimes (the dashed lines). But there are no significant differences in the outcomes for long-term Treasuries and home prices. Equity markets do produce outsized returns in *tightening* episodes. We may be observing the policy reaction function of monetary policy restraint in a booming share market, not a changed inducement to hold equities for different policy rates.

Asserting that monetary policy restraint would be associated with a notable constriction of asset prices is evidently inconsistent with the Fed's history. Of course, there are many problems associated with categorizing outcomes. Keeping in mind the "post hoc, propter hoc" argument made famous by Tobin (1970), the results are silent as to causation. Additionally, a policy instrument guided optimally to offset the effects of random and exogenous shocks of the goal variable will not be correlated with the goal variable. But the variables shown in Figure 2 are part of the transmission mechanism and intermediate to the goal of monetary policy. That is, they are part of channels through which policy affects the goal and apparently almost all systematically unrelated to the stance of policy.

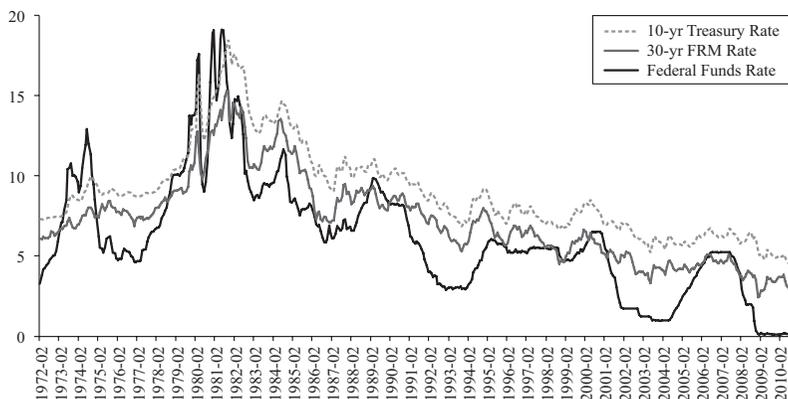
### The Forgotten Open Economy

The lack of association between the stance of policy and key financial market outcomes is not an artifact of our near-century-long comparison. Consider the upper panel of Figure 3, which plots monthly observations of the overnight federal funds rate, the 10-year Treasury yield, and the rate on 30-year fixed-rate mortgages from 1972, around the collapse of the Bretton Woods exchange rate system, onward. For the first quarter-century of the sample, interest rates moved closely together.

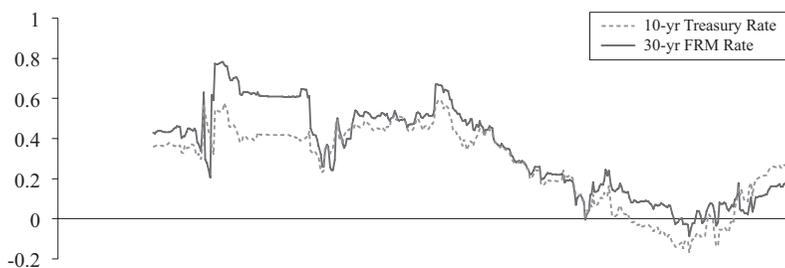
The two lines in the bottom panel plot the simple correlation of the changes in the 10-year Treasury yield and the mortgage rate with changes in the federal funds rate over a 5-year moving window. As is evident, these correlations were typically close to one-half. In the latter parts of the 1990s, something happened and these correlations dropped off sharply. Indeed, for the whole of the period when it is

<sup>3</sup>Redoing the figure for real returns produces identical results.

FIGURE 3  
SELECTED INTEREST RATES, PERCENT



CORRELATION WITH MONTHLY CHANGES IN THE  
FED FUNDS RATE OVER 5-YEAR MOVING PERIODS

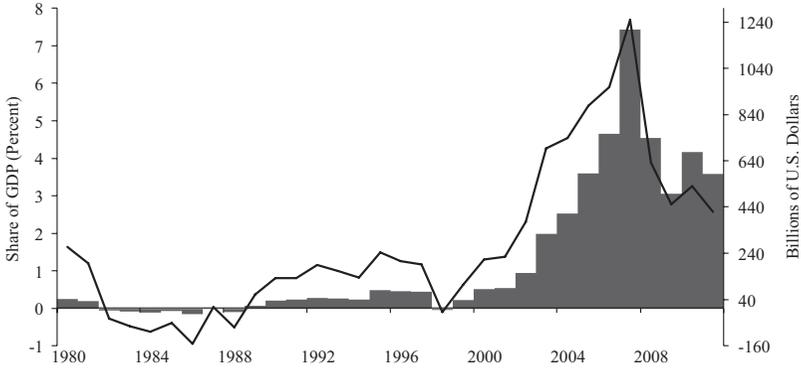


SOURCE: Federal Reserve, H.15 Statistical Release, authors' calculations.

asserted that the Fed kept financial conditions too accommodative, the policy rate and the most important market yield were negatively related (see Greenspan 2010 for a related analysis).

There are many potential explanations for this lack of association and the limited scope for the Fed to have sharply altered the course of the past few years. The most plausible one to us is that analysts often focus too intently on the domestic economy. Probably the most dramatic set of events for emerging market economies in the late 1990s was the Asian financial crises of 1997 to 1998. The crises were cathartic for authorities in that region, who apparently as a result put a very high premium on assuring a reliable export

FIGURE 4  
RESERVE ACCUMULATION OF EMERGING MARKET  
AND DEVELOPING COUNTRIES



SOURCE: International Monetary Fund, *World Economic Outlook* (2010).

market by managing their U.S. dollar exchange rates and building up foreign exchange reserves.

The result was a sharp pickup in reserve accumulation, shown for emerging market and developing economies in Figure 4. The bars provide the dollar amounts of annual additions to reserves, which peaked at \$1.25 trillion in 2007. As shown by the line, authorities in these economies were willing to direct the equivalent of around 4 to 7.5 percent of their nominal incomes to reserve accumulation. Indeed, as the housing bubble inflated from 2002 to 2006, these economies accumulated \$2.25 trillion of reserves or an average of 4.5 percent of their GDP. Statistics from the International Monetary Fund indicate that about two-thirds of those purchases were directed to U.S. dollar obligations.<sup>4</sup>

This willing funding by foreign official accounts altered the composition of finance and kept the level of long-term interest rates in the United States low. First, as for the compositional effect, foreign official entities loaded up on U.S. government securities, leaving private demands unmet. Into this void, financial engineers constructed AAA-rated dollar exposure by using housing collateral to

<sup>4</sup>See Currency Composition of Official Foreign Exchange Reserves at [www.imf.org/external/np/sta/cofer/eng/index.htm](http://www.imf.org/external/np/sta/cofer/eng/index.htm).

create mortgage-backed securities and collateralized-mortgage obligations. The top tiers of those payment flows were rated by the rating agencies as triple-A, meeting the need, particularly, of foreign banks that were desirous of those securities' special treatment under the Basel II capital rules.

This posed a problem for the investment banks that put in motion the process of financial engineering. Underwriting these complicated securities to meet the demand of foreigners for AAA-rated credit left them with bits and pieces of securities on the cutting-room floor. This unwanted residue of their own underwritings represented highly leveraged bets on the U.S. housing market that proved difficult to remove from their balance sheets.

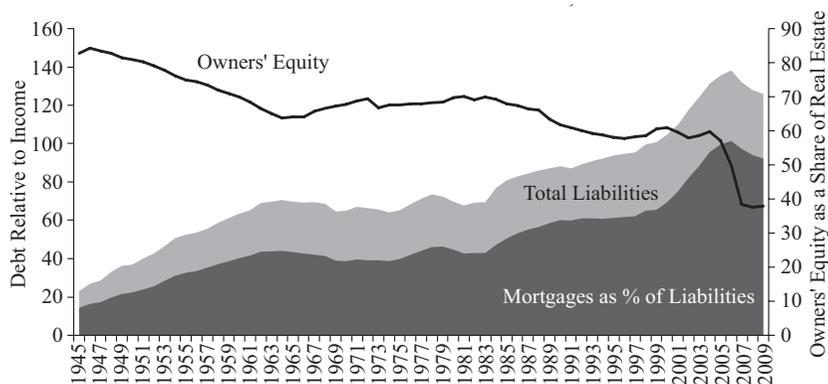
The second main consequence of these global savings was to keep U.S. long-term interest rates lower than they would have been otherwise. Any analyst pointing to Federal Reserve policy as augmenting the housing boom must first address how the Federal Reserve might have had the leverage to do so. In the event, the simple correlation from 2002 to 2006 between its policy instrument and the rate that matters for housing activity was negative and statistically insignificant from zero. This is a simple, reduced-form, association between two interest rates that both respond to and influence many other economic variables. It is possible that all those other channels in the background happen to offset, on net, a systematic effect of the policy rate on the market rate. But perhaps not, or perhaps not in a manner than would have yielded predictable results from policy changes.

## Conclusion

In an open economy, the central bank has less scope to influence the path of globally traded financial assets. Thus, the lack of association between the stance of policy and the longer-term rates that matter for spending—either broadly stated over the past century or narrowly focused on the past decade—should not come as a surprise. This does not, however, absolve the Fed from all responsibility.

The free flow of international capital irons out yield differentials across world markets by facilitating the exchange of financial obligations. Thus, signals from the market about domestic imbalances are not in prices but rather in quantities. And there were signals. In particular, the benign mortgage rate environment of the 2000s was associated with a marked scaling up of household liabilities. As

FIGURE 5  
U.S. HOUSEHOLD SECTOR BALANCE SHEET, PERCENT



SOURCE: Federal Reserve, Flow of Funds Accounts.

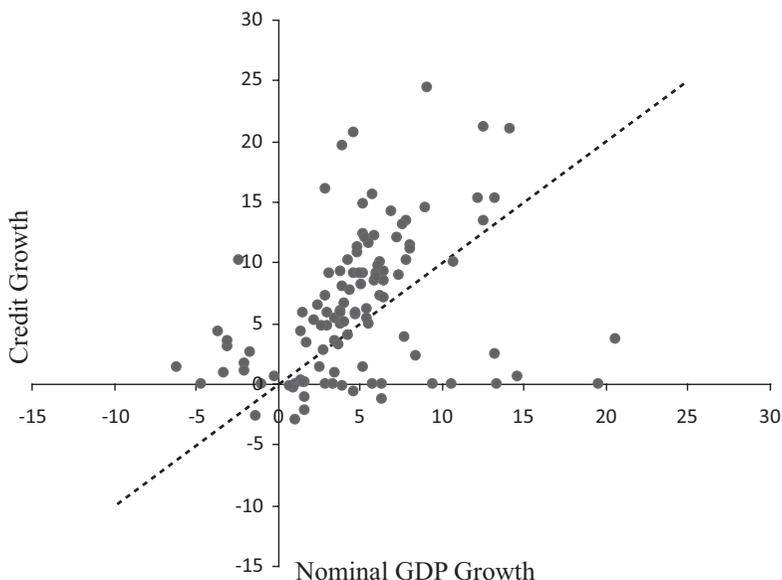
shown in Figure 5, the total liabilities of the U.S. household sector rose about 25 percentage points of nominal income from 2002 to 2006, virtually all of which was accounted for by mortgages.

The leverage of households was rationalized at the time by the strong equity component of balance sheets—the housing equity component. The more than 20 percentage point decline in owners' equity (the solid line) commencing in 2005 showed the fragility of those underpinnings. As we demonstrated in Reinhart and Reinhart (2010), a similar leverage cycle recurred in the 15 most severe financial crises of the past century.<sup>5</sup>

The United States, by the way, was not alone. Figure 6 plots the annual pairs of the growth of domestic credit and nominal GDP for 11 advanced economies from 2000 to 2009. About three-quarters of the observations lie above the 45 degree line, implying sustained and widespread reliance on leverage. This suggests another avenue that has been unexplored by those criticizing Fed policy. Many other economies had systemic banking crises and fell into recession. Some of them had their own currency and an independent monetary policy (Iceland and the United Kingdom), and some did not have their own currency (Ireland and Spain) and had a monetary

<sup>5</sup>Geanakoplos (2010) makes a forceful argument for recognizing the importance of the leverage cycle.

FIGURE 6  
 GROWTH OF DOMESTIC CREDIT RELATIVE TO NOMINAL  
 INCOME ANNUALLY ACROSS 11 ECONOMIES,  
 2000–2009, PERCENT



SOURCE: [www.principalglobalindicators.org](http://www.principalglobalindicators.org).

policy dictated by a foreign capital. How could Fed decisions have been so central to all those shared dislocations? Moreover, none of the major economies that exhibit a “fear of floating” (as in Calvo and Reinhart 2002) and have to keep their domestic monetary policies aligned with the Fed had systemic banking crises. Why did the problems attendant to easy monetary policy, asserted to be central to our imbalances, stop at our borders?

The historical record does not provide a platform to support an outsized role for the Federal Reserve in avoiding the financial crisis. But as financial market prices tend to overshoot, so too do reputations. The fall in the Fed’s standing in the past few years owes importantly to a correction of its buildup in the years before. In part, the widespread belief that Fed policy contributed importantly to the Great Moderation left its reputation vulnerable when the economy left its sweet spot. After all, pride does go before a fall.

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