Bank Regulation as Monetary Policy: Lessons from the Great Recession

Steve H. Hanke and Matt Sekerke

For central bankers, financial institutions, and the public, these are extraordinary times. The measures undertaken by the world's premier central banks in recent years are as innovative as they are immense. Despite the attention attracted by these unusual interventions, however, economists and the public alike have struggled to understand the latest practices of monetary policy. Accordingly, the window is open for us to raise the most basic of questions: What has the stance of monetary policy been since the Great Recession?

The historically low interest rates that have prevailed across the developed world since 2008 would seem to furnish an immediate and incontrovertible answer. Rates remain close to zero in the United States and the United Kingdom, while Japan, the eurozone, and other European central banks have experimented with negative policy rates. The stance of monetary policy would appear to be very accommodative, and our question would seem impertinent if there were not several puzzles also accompanying these historically low interest rates. In the United States, Japan, and Europe, inflation has remained well below target levels, even after stripping away the

---

Cato Journal, Vol. 37, No. 2 (Spring/Summer 2017).

Steve H. Hanke is Professor of Applied Economics at The Johns Hopkins University, Senior Fellow at the Cato Institute, and Director of Cato's Troubled Currencies Project. He is also Co-Director of The Johns Hopkins Institute for Applied Economics, Global Health, and the Study of Business Enterprise. Matt Sekerke is a Fellow at the Institute for Applied Economics. The authors thank Warren Coats, Tim Congdon, John Greenwood, and Gerald O'Driscoll for comments on an earlier draft.

impact of collapsing energy prices. Net investment has been anemic and so has growth.

The prevailing diagnosis of the current anomalous situation puts us in a liquidity trap. Central bankers have given the private sector every possible incentive to induce new investment and stimulate aggregate demand. Extraordinary monetary policy stimulus was helpful, on balance, but not nearly enough. We have tested and broken through the zero bound. Now only fiscal expansion can save us, so blank checks for public infrastructure spending are being readied. Even the anomaly has an obvious explanation and solution, or so it seems.

In this article, we depart from the consensus view by suggesting that growth rates of broad money are a better indication of the post-crisis stance of monetary policy in the United States than the federal funds rate.[1] Viewed from the perspective of broad money—we prefer the unweighted "M4 minus" (hereafter, M4−) aggregate compiled by the Center for Financial Stability[2]—the stance of

[1]We note that growth in broad money consistently tracks growth in nominal aggregate demand, as measured by final sales to domestic purchasers (i.e., gross domestic purchases minus the change in private inventories). Suggesting that broad money has a *causal* role to play is a version of monetarism. Our readers have rightly raised questions about choices of monetary aggregates and the direction of causality between broad money growth and nominal aggregate demand growth. A full exposition and defense of monetarism would take more space than we have here, however. In addition, one of our readers (Warren Coats) questioned our connection of broad money and monetary policy, arguing that the central bank has limited ability to control broad money and may not be interested in targeting broad money. This view implicitly defines monetary policy as whatever the central bank does or attempts to do. In contrast to this view, we take monetary policy to mean the totality of actions taken by the government to influence monetary conditions in a fiat money system. Monetary policy thus includes banking and capital markets regulation and decisions about primary surpluses and debt issuance by the fiscal authorities, in addition to actions by the central bank to influence the quantity of money, various rates of interest, and the term structure of inflation. Once again, following this thought completely would take us too far away from the task at hand.

[2]The Center for Financial Stability (CFS) publishes Divisia indices of broad money that weight each component by its user cost, measured as forgone interest. An instrument has greater weight in a Divisia money index if its user cost is greater. See Barnett (2011) for details on the index methodology and a spirited defense of weighted monetary aggregates' virtues relative to simple sum aggregates. We have nevertheless used the CFS index definitions without the user-cost weights. On a practical level, eliminating the weights allows for an analysis of levels and components of broad money that is not possible when using the indices alone. On a theoretical level, one of us (Sekerke) is skeptical that the user-cost weights do, in fact, serve the aggregation-theoretic purpose of rendering the components of broad money close substitutes for each other.

monetary policy has been relatively tight since the beginning of the credit crisis. Postcrisis legislation and changes to the international bank regulatory regime are primarily responsible for reduced broad money growth. Their combined effect has been to establish bank regulation as the primary determinant of monetary conditions, as opposed to a regime of central bank dominance or fiscal dominance. The Federal Reserve has been able to partially offset the monetary effects of these regulatory changes through quantitative easing (QE). But an unintended consequence of QE has been to divert attention from obstacles to money creation by the banking system. The pattern of bank lending that may be expected to prevail without large-scale support from the Fed's balance sheet has serious implications for any QE exit strategy.[3]

We begin with a taxonomy of broad money and sources of broad money growth. In normal times, broad money expansion is a consequence of actions undertaken by the banking system and the nonbank private sector. An interest rate–targeting central bank generally takes these sources of money growth as given and adjusts the quantity of bank reserves to achieve interest rate outcomes. The flood of bank reserves created by QE has rendered this operating model obsolete (Hanke and Sekerke 2016).

We then go on to describe a series of key developments and regulatory changes that have driven the evolution of broad money since the Great Recession. Each of these developments has tended to reduce the ability of the banking system and the private sector to create money. Quantitative easing, conversely, has allowed the state to replace banks and the private sector as the driving force for broad money growth.

While an expanded Federal Reserve balance sheet has largely compensated the shrinking monetary balance sheets of the banking system and the nonbank private sector, it has created a new conundrum. Bringing QE to an end—without addressing the banking system's ability to create broad money—risks leaving the economy with a stagnating fund of purchasing power. Many bankable projects continue to remain unfunded, especially for smaller businesses and

[3]Congdon (2015, 2016) argues that the Federal Reserve has already begun to exit QE to the extent that maturing securities have not been replaced with additional purchases. In a dynamic, infinite-horizon setting like Cochrane (2001), a central bank's commitment to purchase government bonds that haven't yet been issued is as important, if not more important, than its purchases of currently outstanding bonds.

less-wealthy households, reinforcing existing declines in investment, business dynamism, and competition, among other adverse structural trends. A policy to address the economic and regulatory determinants of bank credit creation directly would thus be a linchpin of a successful QE exit strategy.

The Structure of Broad Money

Broad money encompasses the aggregate of purchasing power available within the economy. The aggregate captures all instruments that serve as a medium of exchange and store of value. Monetary instruments share the attribute of "information insensitivity" (Gorton and Metrick 2012), which means their values do not fluctuate away from par with changes in market information. Table 1 shows the composition of the Center for Financial Stability's monetary aggregates, from the narrowest (M1) to the broadest (M4−) definitions.[4]

The components of broad money (we will focus on M4−) have different origins that determine how they grow. Government-issued money (*state money*) comprises coins, notes, and bank reserves.[5] Growth in state money is determined by fiscal decisions concerning deficit finance, as well as central bank actions that trade government debt for currency and reserves, base money for foreign reserves, or discount window–eligible collateral for reserves, among other transactions.

Bank money is created by the banking system when banks make loans. Upon credit approval, a borrower receives a deposit balance, created out of nothing more than a book entry by the bank to balance the new loan asset. The borrower thus obtains purchasing power in the form of a deposit. He is free to withdraw that purchasing power in the form of currency, but it is more often the case that the purchasing power remains within the banking system, transferred from bank to bank within the clearing system. Deposits thus circulate as money in their own right, and such transfers of deposits far exceed the volume of transactions in currency. In the United States, nonbanks

[4]The CFS compiles other indices not analyzed in Table 1. One of these is a broader M4 index that includes Treasury bills. We are skeptical about designating Treasury bills money and therefore prefer M4− as our broadest measure of the money supply.

[5]Coins, notes, and bank reserves make up the monetary base (M0). Of these, only coins and notes (currency) are included in broad money aggregates.

TABLE 1
Components of Broad Money Aggregates
(Mapped to Lower-Level Aggregates
and Components)

Broad Monetary Aggregates	Lower-Level Monetary Aggregates	Components
M4−	Nonbank private money	Commercial paper
	Nonbank private money	Institutional money funds
M3	Nonbank private money	Overnight and term repurchase agreements
	Bank money	Large-denomination time deposits
M2	Nonbank private money	Retail money funds
	Bank money	Small-denomination time deposits
	Bank money	Money market deposit accounts
	Bank money	Savings deposits
M1	Bank money	Non-interest-bearing deposits
	Bank money	Travelers' checks
	State money	Currency

Source: Center for Financial Stability.

transacted $203,424 billion dollars in 128 trillion bank-mediated payment transactions in 2014, the last year for which comprehensive data are available.[6] Accordingly, bank money and broad money aggregates are much better indices of purchasing power than the monetary base.

Money-like instruments may also be created outside the banking system by private actors. We term these instruments *nonbank private money*. Nonbank private money is the recirculation of existing balances as money in the capital markets, generally from the

[6]Committee on Payments and Market Infrastructures, Bank for International Settlements. Statistics on payment, clearing, and settlement systems in the CPMI countries, data for 2015, preliminary release (September 2016). Available at www.bis.org/cpmi/publ/d152.htm.

nonfinancial corporate sector. Its primary components are commercial paper and repurchase agreements, which may be held as money balances either directly or via prime money market mutual funds (MMMFs). Nonbank private money was especially notable as a counterpart to "shadow banking" activity in the run up to the credit crisis. Commercial paper, repo, and prime MMMFs were key short-term funding providers for securitization warehouses and dealer inventories.

Accordingly, we distinguish a three-way taxonomy of broad money, instead of the inside/outside money terminology introduced by Gurley and Shaw (1960). Nonbank private money is not easily lumped with money created inside the banking system. Though it originates outside the banking system, it isn't state money and thus it grows by a completely different set of rules. Table 2 shows the relative shares of the three components in the simple sum M4− index, as of certain key dates we will discuss further below.

The bank money/nonbank private money distinction corresponds, in a rough way, to the commercial bank/broker-dealer division present in most large bank holding companies. When securitization markets are active, the broker-dealer business is complementary to

TABLE 2
Broad Money (M4− Definition), Shares by Origin

Episode	As of Date	State	Banks	Nonbanks
Credit Expansion Period (Start)	January 2000	6.22%	49.11%	44.66%
Credit Expansion Period (End)	August 2007	5.02%	49.72%	45.26%
QE1 (Start)	December 2008	5.04%	50.95%	44.01%
QE1 (End)	March 2010	5.80%	57.94%	36.25%
QE2 (Start)	November 2010	5.96%	58.05%	35.99%
QE2 (End)	June 2011	6.15%	58.76%	35.09%
QE3 (Start)	September 2012	6.58%	61.56%	31.86%
QE3 (End)	December 2013	6.83%	63.51%	29.66%
Current Data	October 2016	7.52%	66.95%	25.53%
Change in Share (End of Credit Expansion Period to Present)		2.51%	17.23%	−19.74%

Source: Central for Financial Stability.

credit creation through the commercial banking business. Loans created by the commercial bank side of the holding company can be purchased by the broker-dealer side using capital markets funding raised in a securitization transaction. Upon sale of the loan, the risk of the loan is cancelled for the commercial bank, but the credit created by the bank remains outstanding as money and continues to circulate within the banking system.

By allowing bank holding companies to transfer "banking book" *credit* risk to broker-dealer affiliates as "trading book" *market* risk via securitizations, the precrisis bank regulatory regime encouraged credit creation through bank lending. Rather than bank money, the money created appeared as nonbank private money. In this way, large bank holding companies could subvert the disincentives to lending that had prevailed since Basel I first laid down standardized credit risk charges. When analyzing the impact of postcrisis regulation on broad money, it is therefore crucial to distinguish banking book and trading book reforms, since they impact different components of the money supply.

Finally, we need to consider who holds broad money balances. Consider the taxonomy used in the *Financial Accounts of the United States* (the Z.1 "flow-of-funds" data released by the Federal Reserve Board). Broad money liabilities reside within the financial sector, where they are primarily assets of the nonfinancial sector. Within the nonfinancial sector, we can distinguish between monetary assets held by households and nonfinancial business, whether in corporate or noncorporate form.

A distribution of money balances exists within each of the above sectors. When analyzing credit conditions, we can call these balances *equity*, since they potentially supply a borrower's interest or downpayment in a bank-financed project. Borrower equity is essential to loan market equilibrium. Individuals and firms may wish to borrow money at a given interest rate, but many are excluded from the market because they lack sufficient equity to obtain a loan. On the other hand, borrowers who have sufficient equity have little trouble obtaining credit. Concentrations of money balances thus concentrate lending opportunities, making the *stock* as well as the *flow* of money balances non-neutral.[7]

[7]See Holmström and Tirole (2010) for a simple model of credit rationing where borrower equity is the critical factor.

Developments in Bank Regulation and Broad Money, 2007–Present

We are now in a position to discuss developments in broad money from August 2007, the widely accepted beginning of the credit crisis, to the present day. In each case, regulatory intervention is the outstanding feature (Hanke, forthcoming; Hanke and Sekerke 2016), entrenching bank regulation as a primary driver of monetary policy.

Unwinding of "Shadow Bank" Activity

The story of the credit crisis has been told before (e.g., Brunnermeier 2009, Duffie 2010, Gorton and Metrick 2012). Its consequences for broad money have been less appreciated.

Large broker-dealer securitization operations rely heavily on nonbank private money creation for short-term finance.[8] Before newly originated mortgage loans can be transferred to a special purpose entity in a mortgage-backed securitization, for example, they are typically "warehoused" in a dealer conduit financed by commercial paper. Transfer to a warehousing facility allows the originating bank to remove the mortgage from its books, economizing risk capital, while the credit created by the originating bank—a new deposit—remains in circulation. Bank money and nonbank private money both expand.

Later in the securitization process, the special purpose entity issues bonds (mortgage- or asset-backed securities) and uses the proceeds to purchase warehoused assets from the broker-dealer. Holders of the warehouse's commercial paper are repaid in full, and the securities are distributed to investors, or financed and held as inventory by the broker-dealer. The broker-dealer might carry the bond in another warehousing facility, possibly for sale to a structured finance CDO, or use the bond as collateral in a repurchase transaction. In either case, the broker-dealer would recover its principal so that the provider of funds in the commercial paper or repurchase transaction would be regarded as the ultimate financier of the securitization. These funds are nonbank private money.

[8]Our discussion is highly simplified and does not do justice to several relevant postcrisis regulatory changes.

Since finance is predominantly conducted by intermediaries, the largest holders of the asset-backed commercial paper created in the securitization process were prime MMMFs. Repurchase agreements, on the other hand, are believed to have been held predominantly by broker-dealers and corporate treasuries. The willingness of these parties to continue rolling over these short-term, money-like obligations permitted private securitization activity to expand into the trillions of dollars annually.

As the creditworthiness of the mortgages backing private-label securitizations came into question in August 2007, several prime MMMFs holding mortgage warehouse commercial paper faced a wave of redemption requests. BNP Paribas suspended withdrawals on three of its money market funds. The loss of funding fell particularly hard on Northern Rock, which entered bankruptcy shortly afterward in September. A year later, prime MMMFs holding short-term Lehman Brothers obligations met a similar fate. The Reserve Primary Fund famously found itself unable to maintain a net asset value (NAV) of par, prompting runs on other prime MMMFs.

Over the course of the crisis, the supply of asset-backed commercial paper declined from an August 2007 peak of $1.2 trillion dollars to $416 billion in August 2009.[9] In the United States, the Securities and Exchange Commission (SEC) reacted to the prime MMMF episode by requiring floating NAVs from all MMMFs holding assets other than cash, government securities, or repurchase agreements collateralized by government securities. Investors have duly shifted their holdings from prime to government funds, while the Treasury has met new demands for bills and notes.[10]

The market for repurchase agreements first consumed Bear Stearns in March 2008, followed by Lehman Brothers in September 2008. Investors were increasingly reluctant to advance funds against mortgage-backed securities (MBS) and asset-backed securities (ABS) collateral and demanded larger haircuts until they became prohibitively large (Gorton and Metrick 2012). The size of

[9]FRED Economic Data, St. Louis Fed.

[10]"The prime MMMF industry has shrunk from nearly $1.5tn at the start of the year to just $538bn. This has helped subdue yields on short-term Treasury bills but led to sharply higher short-term funding costs for banks, companies and US municipalities" (Rennison and Wigglesworth 2016).

the market for repurchase agreements has contracted by more than half relative to its precrisis peak.[11] Subsequently, regulators have amended counterparty credit risk charges to encourage the use of "triparty repo" agreements, which resemble a centralized clearing arrangement and are relatively weak sources of MBS and ABS repo.[12]

Securitization was not the only use of funds intermediated by commercial paper and repurchase agreement markets. Commercial paper funds large corporations, and the market for repurchase agreements backed by Treasuries, Agencies, and other high-quality paper remains vibrant. However, no transactional technology has emerged in the place of securitization to stimulate the growth of nonbank private money since the crisis. These components of broad money remain depressed, and new regulations governing MMMFs and repurchase agreements make it unlikely that nonbank private money will grow again at an appreciable rate.

Rerating Bank Credit Risk and Recapitalization

The above-mentioned failures of Northern Rock, Bear Stearns, and Lehman Brothers, among other institutions, led regulators to reassess bank credit risk and the amount of leverage employed by large international banks.[13] Regulators came to the conclusion that bank holding companies (BHCs) were holding more credit risk than was acceptable, and therefore more equity would be needed for bank holding companies to absorb unexpected credit losses.

[11]CFS data show a decline of half but do not include the bilateral repurchase agreements that were a more important source of financing for private-label MBS and ABS collateral.

[12]Centralized markets are, of course, easier for regulators to monitor, though regulators tend to discount the cost that such monitoring imposes on monitored institutions. Increased regulation and costs "contributed to JPMorgan's decision to exit" the majority of its triparty repo operations within the next 18 months, leaving BNY Mellon as the sole player in the market. "JPMorgan's decision to leave the funding market will increase the regulatory scrutiny applied to BNY Mellon" (Rennison 2016).

[13]It is important to note that neither Bear Stearns nor Lehman Brothers was a bank. Both were broker-dealers, along with Merrill Lynch (acquired by Bank of America), Goldman Sachs, and Morgan Stanley. The latter two firms agreed to convert to bank holding companies after Lehman Brothers failed. Hence, risks previously taken by broker-dealers have been addressed by regulations on bank holding companies, a glaring category error.

When BHCs raise equity, purchasing power in the form of deposits is transferred from the nonfinancial sector to the financial sector—from customer bank accounts to BHC "house" accounts. New BHC equity can, under the right conditions, augment capacity to create credit on the commercial banking side of the house. But contrary to widespread misunderstandings catalyzed by Admati and Hellwig (2013), among many others, commercial banks do not "lend out" their equity, levered by customer and wholesale funds. Instead, BHCs must have sufficient funds in their house accounts to support the credit risk of their (commercial bank) lending as well as their (broker-dealer) trading portfolios. Funds are drawn from the house account to settle transactions when defaulted credit-risky assets fail to meet scheduled cash flows and securities holdings experience unexpected losses. In this way, the commercial bank makes its own balance sheet whole and covers any liquidity shortfalls that arise from defaults and market losses.

Mandated postcrisis equity increases were doubly punitive to banks. Credit risk weights were increased for new lending *and* for loans and securities currently owned by BHCs. Though much of the weight of Basel 2.5 and Basel III has fallen on the broker-dealer side of BHCs, addressing the market risk of securitization transactions and their derivatives, the commercial banking side has not escaped its own slate of reforms.[14] These rules have effectively sterilized any credit-creation capacity that BHC equity increases might have afforded.

Increases in margin for derivatives trading will have a similar monetary effect to capital raising, with the burden falling on both banks and their (mostly nonfinancial) customers. When cash is used for margin balances, it sits idly against contingent losses on derivative trades. An early estimate by the International Swaps and Derivatives Association (ISDA 2012) projected that $1.7 to $10.2 trillion in money balances will be idled worldwide by new over-the-counter derivatives margining requirements. The new requirements are still being phased in, which has limited their impact to date.

On balance, recapitalization of the banking system resulted in a decline in the deposits held by the nonfinancial sector, where they

[14]We explore the regulatory details further in a companion piece (Hanke and Sekerke 2016).

provide purchasing power, while increasing deposits and margin balances held by BHCs. Equity deposits either replace cash flows from defaulted assets, allowing banks to settle transactions with other banks, or get returned to bank shareholders after a long delay if unexpected losses do not ultimately materialize. Increased equity does not spur new lending when it is coupled with increased risk weights for new and existing loans.

Quantitative Easing

Contractions in nonbank private money drained the banking system of liquidity and equity. The lost equity was partially replaced by transfers of bank money from the nonfinancial sector to the financial sector. That transfer effectively canceled the moneyness of the nonfinancial sector deposits, reducing the supply of bank money. Yet the supply of bank money has grown since the crisis. What has been done to replace bank money in the nonfinancial sector?

The Federal Reserve's quantitative easing programs have been largely effective in getting purchasing power back into the hands of the nonfinancial sector. Nonbank holders of Treasury and Agency securities have been able to exchange them with the Federal Reserve for bank deposits. Banks intermediating these securities transactions receive reserve balances (state money) that are passed through one-for-one to customers as deposit balances, making QE a sort of "narrow banking" transaction. While this increased endowment of reserves creates other problems for the banking system, the "pass-through" of state money creation to bank money and nonfinancial sector deposits supports broad money growth. Other QE campaigns in Japan and Europe that have purchased securities from the banking sector have not been successful because broad money growth does not accompany state money creation (Congdon 2011, Greenwood 2016, Hanke and Sekerke 2016).

The government's conservatorship of Fannie Mae and Freddie Mac may also be considered a component of QE to the extent that it has increased the supply of riskless claims on the government eligible for QE. As mentioned above, Agency securities have become a primary component of the Federal Reserve's QE operations. At the same time, Agency MBS remain a government-backed inducement to credit creation by the banking system. So long as a mortgage conforms to the agencies' criteria, a bank may make a mortgage loan, treat the loan as virtually risk-free for capital purposes, and sell the mortgage to

the agencies without retaining credit risk exposure. Accordingly, the supply of residential mortgage credit has remained robust in recent years, at least for borrowers with solid credit and/or substantial equity.[15] And temptation remains for lawmakers to boost the supply of mortgage credit by relaxing the agencies' underwriting criteria.[16]

To the extent that QE relies on transactions in outstanding government debt and government-guaranteed obligations, it is overall neutral for purchasing power, transferring power from government to private hands. In this sense, QE is "helicopter money" for the period it remains outstanding (Nangle 2016).

An Overall Look at Broad Money

A look at the development of broad money aggregates since the beginning of the credit crisis ties our themes together. We present levels and compound annual growth rates for selected broad money aggregates in Tables 3 and 4. Table 3 is provided to give a sense of scale to the dimensionless growth rates in Table 4. Time periods are broken down according to phases of QE.

Overall, the clear theme of the growth rates in Table 4 is the significant reduction in broad money growth, as measured by the M4− index. When viewed through the lens of M4−, monetary policy in the United States has actually been relatively tight in the postcrisis era.[17] Puzzles about inflation, investment, and growth seem less puzzling from this perspective. The demand and savings deposits created by QE have supported growth in M1 and M2, which have remained at or above precrisis levels. But the state money-driven recovery in M1 and M2 has not been sufficient to offset the drag on credit creation by banks induced by postcrisis regulation, or the collapse of nonbank private money precipitated by the credit crisis and enforced by Basel III.

The relative contributions of state money, bank money, and nonbank private money to postcrisis monetary conditions are summarized in Table 5. (Refer to Table 1 for the instruments included in

[15]Other regulatory costs of mortgage origination that fall on banks have allowed nonbank mortgage originators to take market share from banks, however.

[16]According to our definition, changes in these criteria would also qualify as monetary policy.

[17]Jacques de Larosière (2016) provides evidence that much the same can be said about Europe's postcrisis monetary policy stance.

TABLE 3
Broad Money Aggregates, Levels (USD Billions)

Episode	As of Date	M1	M2	M3	M4−
Credit Expansion Period (Start)	January 2000	1,492.30	4,647.20	6,333.73	8,432.52
Credit Expansion Period (End)	August 2007	2,131.80	7,348.20	11,543.58	15,127.38
QE1 (Start)	December 2008	2,359.80	8,166.60	12,060.67	16,188.49
QE1 (End)	March 2010	2,509.60	8,471.00	11,841.08	15,019.95
QE2 (Start)	November 2010	2,637.30	8,741.80	12,355.22	15,341.51
QE2 (End)	June 2011	2,747.70	9,092.80	12,606.46	15,663.94
QE3 (Start)	September 2012	3,275.42	10,183.10	13,493.95	16,225.36
QE3 (End)	December 2013	3,664.47	10,994.70	14,177.18	16,998.95
Current Data	October 2016	4,669.41	13,138.60	16,041.69	18,712.79

Source: Center for Financial Stability.

TABLE 4
BROAD MONEY AGGREGATES: COMPOUND ANNUAL GROWTH RATES

Episode	Beginning	Ending	M1	M2	M3	M4−
Credit Expansion Period	January 2000	August 2007	4.82%	6.23%	8.24%	8.01%
Early Crisis	August 2007	December 2008	7.92%	8.24%	3.34%	5.22%
QE1	December 2008	March 2010	5.05%	2.97%	−1.46%	−5.82%
	March 2010	November 2010	7.73%	4.83%	6.58%	3.23%
QE2	November 2010	June 2011	7.28%	6.98%	3.51%	3.63%
	June 2011	September 2012	15.09%	9.48%	5.59%	2.86%
QE3	September 2012	December 2013	9.39%	6.33%	4.03%	3.80%
Recent Growth Period	December 2013	October 2016	8.93%	6.49%	4.46%	3.45%
Recent Growth Period Rates Minus Credit Expansion Period Growth Rates			4.11%	0.26%	−3.78%	−4.56%

SOURCE: Center for Financial Stability.

TABLE 5
Broad Money: Compound Annual Growth Rates by Source

Episode	Beginning	Ending	State	Banks	Nonbanks
Credit Expansion Period	January 2000	August 2007	4.98%	8.19%	8.20%
Early Crisis	August 2007	December 2008	5.61%	7.16%	3.03%
QE1	December 2008	March 2010	5.38%	4.40%	−19.35%
	March 2010	November 2010	7.56%	3.51%	2.09%
QE2	November 2010	June 2011	9.30%	5.81%	−0.77%
	June 2011	September 2012	8.58%	6.76%	−4.79%
QE3	September 2012	December 2013	6.84%	6.43%	−1.98%
Recent Growth Period	December 2013	October 2016	7.07%	5.39%	−1.89%
Recent Growth Period Rates Minus Credit Expansion Period Growth Rates			2.08%	−2.80%	−10.09%

Source: Center for Financial Stability.

each component.) Nonbank private money declined at a nearly 20 percent annualized rate during the QE1 period, dragging down the M4− aggregate, which declined at a 5 percent annualized rate (Table 4). Bank money has grown at a slower rate from August 2007 onward, but positive growth rates have resulted in bank money becoming a much larger share of broad money, as seen in Table 2.

The contribution of state money to broad money growth is understated in Table 5 because only currency figures directly in M4−. Much of the postcrisis growth in bank money was accompanied by the Fed's creation of reserve money to fund QE. The expansion of reserves should arguably shift some of the banking system's contribution to broad money into the state's column. Whereas the bank money component of M4− increased by $5 trillion from August 2007 to October 2016, reserve balances increased from $5 billion to a peak of nearly $2.8 trillion in August 2014.[18] Reserve balances have tapered off since, but the contribution of state money growth to bank money growth remains evident and substantial.

Lessons and Recommendations

Regulatory measures to restrain private-label securitization have drained nonbank private money from the system and have significantly constrained the growth of bank money. From the 1990s onward, securitization encouraged banks to continue growing loan portfolios that would have otherwise been limited by banking book capital requirements. Transactions that allowed BHCs to refile credit risk as market risk and commercial bank business as broker-dealer business let BHCs go on creating money through new lending. Though the practice was subject to abuse, private-label securitization nevertheless allowed bank money to continue growing at a brisk rate.

It is not possible in this space to evaluate whether Basel I's credit risk weights were overly burdensome for loan growth, whether precrisis securitization markets boosted loan growth excessively, or whether the current stock of broad money is surplus to needs. However, it is evident that regulators' intended restrictions on private-label securitization have been accompanied by unintended

[18]FRED Economic Data, St. Louis Fed.

declines in broad money growth rates. At the same time, the U.S. government's guarantee of Fannie Mae and Freddie Mac continues to encourage growth in mortgage lending. Fannie Mae and Freddie Mac securitizations support broad money growth, but perpetuate a distortion favoring residential and multifamily real estate lending. Because of their impact on mortgage credit creation, the underwriting guidelines promulgated by Fannie Mae and Freddie Mac are a material contributing factor to the stance of monetary policy. Relaxing the agencies' underwriting standards is not, however, a good way to reinvigorate broad money growth.

Raising bank capital levels in the middle of a recovery exacerbated the contraction in broad money. The idea that bank equity can be increased without limit and without wider impact to the economy, as argued by Admati and Hellwig (2013), is increasingly becoming the conventional wisdom.[19] Yet their analysis ignores differences between deposits and debt, the interplay between bank equity and credit-creation capacity, and the consequences arising from the transfer of purchasing power from the nonfinancial sector. Since a main part of a bank's value is its ability to produce deposits, a bank's capital structure isn't easily analyzed by analogy with nonfinancial firms (Sekerke 2016). Increasing bank capital in a recession to cover existing exposures fails to boost banks' lending capacity, tightens monetary policy, and impairs recovery.

Against the background of these regulatory maneuvers, QE has been the sole positive development. State money has partially offset declines in bank money and nonbank private money. Hence, the Federal Reserve's balance sheet has expanded significantly without creating a burst of inflation. Yet QE is poised to become a victim of its own success. Cessation of QE in the current environment leaves a beleaguered banking sector as the sole engine of broad money growth.[20]

[19]The European Banking Federation believes that €850bn in additional capital will be required to comply with the latest Basel III capital regulations. (Jenkins 2016)

[20]An end to QE would also leave behind a glut of bank reserves that has already forced the Fed to change the way it targets the fed funds rate. Were reserves to become "tight" again in the interbank market, the Fed could once again steer short-term rates by transacting in the fed funds market. A temporary increase in the reserve requirement would allow the Fed to resume normal operations. The remuneration of reserves is another policy innovation that deserves rethinking.

If no surplus of broad money currently exists, the unprecedented growth of state money is to be curtailed, and nonbank private money is to remain dormant, bank credit creation must compensate for the exit from QE. New bank lending is currently limited by the distribution of equity among creditworthy borrowers and an increased regulatory burden on all forms of bank lending. As a prominent example of the latter problem, bank financing of infrastructure investments would be possible and highly desirable for all parties—as it has been for decades—were it not for new restrictions on longer-term lending meant to rein in "maturity transformation."

In this new environment, monetary policy must focus on the economic and regulatory factors overstimulating lending in favored sectors and holding back bank lending in others. Addressing the concentration of wealth in households and firms will broaden the universe of lending opportunities and sweep in households and firms with a greater willingness to fund themselves with bank credit rather than capital markets funding. A directed credit expansion undertaken without attention to the distribution of equity will only reinforce asset market distortions and disparities in household wealth,[21] while exacerbating financial barriers to competition in the private sector.

The capture of monetary policy by bank regulation has served to synchronize monetary conditions wherever the Basel regulations have force. In its quest to eliminate systemic risk from the banking system, the Basel Committee on Banking Supervision has created systemic risk for the world's fiat money regimes. Governments that have regulated their banking sectors per Basel's standards might do well to reconsider their implementation of Basel III—not to mollify embattled bankers, and not to throw prudence to the winds, but to permit some productive variation in policy. Without some experimentation in bank regulation, the developed world might remain stuck with low or negative interest rates, ever-larger doses of QE, and disappointing growth.

[21]For example, increases in bank lending to private equity vehicles and those with significant real estate holdings do not spread the gains of credit creation widely.

References

Admati, A., and Hellwig, M. (2013) *The Bankers' New Clothes*. Princeton: Princeton University Press.

Barnett, W. A. (2011) *Getting it Wrong: How Faulty Monetary Statistics Undermine the Fed, the Financial Markets, and the Economy*. Cambridge: MIT Press.

Brunnermeier, M. (2009) "Deciphering the Credit and Liquidity Crunch 2007–2008." *Journal of Economic Perspectives* 23 (1): 77–100.

Cochrane, J. (2001) "Long-Term Debt and Optimal Policy in the Fiscal Theory of the Price Level." *Econometrica* 69 (1): 69–116.

Congdon, T. (2011) *Money in a Free Society: Keynes, Friedman, and the New Crisis in Capitalism*. New York: Encounter Books.

_____ (2015) "Global Money Round-Up in Autumn 2015." *International Money Research Limited* (October 21).

_____ (2016) "Global Money Round-Up at the Start of 2016." *International Money Research Limited* (January 11).

Duffie, D. (2010) "The Failure Mechanics of Dealer Banks." *Journal of Economic Perspectives* 24 (1): 51–72.

Gorton, G. A., and Metrick, A. (2012) "Securitized Banking and the Run on Repo." *Journal of Financial Economics* 104 (3): 425–51.

Greenwood, J. (2016) "Why Negative Rates Are Not a Solution for Japan or the Eurozone." Johns Hopkins Institute for Applied Economics, Global Health, and the Study of Business Enterprise, Studies in Applied Economics No. 56.

Gurley, J. G., and Shaw, E. S. (1960) *Money in a Theory of Finance*. Washington: Brookings Institution.

Hanke, S. H. (forthcoming) "The Basel Rules and the Banking System: An American Perspective." In T. Congdon (ed.), *Money in the Great Recession: Did a Money Slowdown Cause the Global Slump of Late 2008 and 2009?* Cheltenham, U.K.: Edward Elgar.

Hanke, S. H., and Sekerke, M. (2016) "Who Controls Broad Money? Inside and Outside Money Before and After the Credit Crisis." Manuscript.

Holmström, B., and Tirole, J. (2010) *Inside and Outside Liquidity*. Cambridge: MIT Press.

International Swaps and Derivatives Assoc., Inc (ISDA) (2012) "Initial Margin for Non-Centrally Cleared Swaps: Understanding the Systemic Implications." Available at www.isda.org.

Jenkins, P. (2016) "Basel Committee Boss Needs to Reconsider Hard Line on Reform." *Financial Times* (October 18).

Larosière, J. (2016) "Thoughts on Monetary Policy: A European Perspective." Occasional Paper No. 93. Washington: Group of Thirty.

Nangle, T. (2016) "How Helicopter Money Works," *Columbia Threadneedle Investments Viewpoint* (May).

Rennison, J. (2016) "Bank's Exit Raises 'US Liquidity Engine' Fears." *Financial Times* (October 13).

Rennison, J, and Wigglesworth, R. (2016) "Funds See Openings in US Money Market Reforms." *Financial Times* (October 5).

Sekerke, M. (2016) "The High Cost of Bank Equity: Reply to Admati and Hellwig." Manuscript.