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Jane D'Arista

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Gordon Hall
418 North Pleasant Street
Amherst, MA 01002

Phone: 413.545.6355
Fax: 413.577.0261
peri@econs.umass.edu
www.peri.umass.edu

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SETTING AN AGENDA FOR MONETARY REFORM

Jane D'Arista

This paper is a revised version of a paper written for the Financial Markets Center in 2002 (*Rebuilding the Transmission System for Monetary Policy)* and presented at the 17th Annual Hyman P. Minsky Conference at the Levy Economics Institute, Bard College, April 17, 2008

Abstract

The role played by monetary policy in creating the conditions that culminated in the current crisis and the failure of the Fed's efforts to end the credit freeze in 2008 are critical components of the analysis needed as a backdrop for reform. This paper argues that the link between excess liquidity, the buildup in debt, the asset bubbles that debt created and the financial crisis that followed are outcomes of monetary as well as regulatory policy failures; that they reflect a substantial weakening in the Fed's ability to implement countercyclical initiatives. It argues that the effectiveness of monetary policy can – and must – be restored and proposes a new system of reserve management that assesses reserves against assets rather than deposits and applies reserve requirements to all segments of the financial sector. It concludes that a change in the current system for implementing monetary policy is needed to end the credit crunch, address the impact of the current crisis on the financial sector and the economy and ensure the success of any fiscal stimulus that will be undertaken.

Key words: *Federal Reserve System, monetary policy, reserve requirements, financial crisis.*

Introduction

After of the eruption of the sub-prime mortgage crisis in the summer of 2007, criticisms of past and present Federal Reserve policies became more frequent. In December 2007, the Fed's belated proposals for regulating all mortgage lenders suggested that it was engaged in the proverbial closing of the barn door after the horses were out. Why it had not thought such restrictions were needed earlier seemed evidence of its ideological commitment to deregulation rather than a pragmatic assessment of developments that could cause market disruption and systemic fragility.

But the Fed's ideological commitments extended beyond its failure to monitor and control poor lending practices and fraud. Fed authorities also ignored ways in which monetary policy itself has lost the ability to stabilize financial markets and the economy those markets are intended to serve. The Fed's monetary influence weakened as it chose to champion deregulation and innovation and gave market forces a larger role in

determining credit expansion. It paid no attention to the way that foreign capital inflows drove up the supply of credit and ignored the explosion in debt that unchecked credit expansion produced. And, as debt soared, the Fed ignored the asset bubbles it fueled.

Also ignored were critical changes in the structure of financial markets that eroded the effectiveness of monetary tools used to transmit policy initiatives to the real economy. Rather than restore its ability to exert a direct influence over credit expansion and contraction, the Fed adhered to outdated tools and policies in ways that became increasingly counterproductive. Too often its actions tended to exacerbate cyclical behavior in financial markets rather than exert a countercyclical influence.

Moreover, as it's bailout of Bear Stearns over the weekend of March 15-16, 2008 made clear, the Fed was unprepared to face a systemic crisis. Throughout 2008, it struggled to act systemically, joining with the Treasury in a series of inconsistent and sometimes frantic improvisations. As a result, it has become increasingly necessary to ask whether or not the central bank itself has contributed to instability and, if so, what can be done to reconstitute a constructive path for monetary policy.

This paper argues that the effectiveness of monetary policy can – and must – be restored to address the impact of the sub-prime mortgage crisis and credit crunch on the financial sector and the economy. It proposes a new system of reserve management that assesses reserves against assets rather than deposits and applies reserve requirements to all segments of the financial sector. This new approach would increase the Fed's ability to respond to credit contractions or expansions because it would be implemented by supplying (or withdrawing) interest-free liabilities in exchange for purchases (or sales) of assets on the balance sheet of the financial sector.

In a downturn, for example, purchases of assets by the central bank in exchange for *free* liabilities would more effectively accomplish what the Fed is now trying to do: halt asset sales that drive down prices and erode financial institutions' capital. Removing assets and providing interest-free liabilities would encourage financial institutions to rebalance their books by lending or expanding their holdings.

In addition, the expansion of reserve requirements would permit all institutions to draw on reserve accounts held with the Fed to make payments to one another. Restoring a publicly guaranteed channel for intra-systemic transactions would alleviate concerns

about counterparty risk and help rebuild confidence in financial markets. Moreover, a supply of new liabilities at no cost emanating from the central bank would make it possible for individual institutions to write-off or restructure the terms of loans or securities and replace them with more credit-worthy assets – a new and powerful monetary tool that would help assuage the destructive force of the current crisis for borrowers as well as lenders.

The opening section of the paper discusses how monetary policy contributed to asset bubbles as the excess liquidity generated by the Fed when the economy failed to respond to policy initiatives created incentives for leverage and rising debt levels. The next section describes the changes in financial structure that have reduced the Fed's leverage, impeded its ability to transmit policy initiatives to the real economy and eroded its stability mandate. The third section proposes a system-wide reserve regime that assesses reserves against assets as a viable model for rebuilding effective transmission mechanisms for monetary policy. The discussion that follows describes the changes that would be needed to implement such a model and describes its advantages and benefits.

Part I. Monetary Policy Paves the Road to Crisis.

Liquidity, credit growth and asset bubbles: In February 2005, Alan Greenspan – then Chairman of the Federal Reserve Board – told the Senate Banking Committee that he was surprised that long-term interest rates had fallen lower than they had been when the Fed started raising its short-term policy rate in 2004. He noted that there had been similar declines in long-term rates in Europe and other countries and concluded that, "for the moment, the broadly unanticipated behavior of world bond markets remains a conundrum" (Greenspan 2005).

For some analysts, these developments were not surprising. They saw falling long-term rates as an inevitable outcome of monetary policy decisions beginning in 2000 that had flooded US and global markets with excess liquidity. In the aftermath of the collapse of major stock indices, the Fed had been concerned about the economy's sluggish response to stimulus and the potential for deflation. To address these concerns, it maintained a nominal federal funds rate of one percent from June 2003 through 2004 by generating a continuous stream of liquidity that pushed the real rate of interest into

negative territory over the period. As investors' so-called "search for yield" intensified in the low interest rate environment, the unprecedented increase in the availability of funding spurred escalating amounts of leveraged speculation in the form of carry trades, where the effect of borrowing short-term at low rates is to drive down rates on the higher-yielding, longer-term assets in which the funds are invested.

Excess liquidity was also reflected in two other characteristics of market conditions that Greenspan mentioned: narrowed risk premiums and eased credit standards. In fact, what was surprising about the chairman's testimony was his silence on the subject of liquidity, which is, after all, what central banks create and curb in their quest for price stability.

By contrast, the Managing Director and staff of the Bank for International Settlements (BIS) argued in their June 2004 *Annual Report* that there was a direct link between accommodative monetary policies in the G-3 countries (the US, the euro-area and Japan) and mounting liquidity in global financial markets. The report pointed to quantitative measures such as the monetary base, broad money and credit to the private sector – all of which had expanded rapidly since 1999 in a large group of countries – as clear evidence of exceptional liquidity growth. Moreover, in 2003 the BIS had specifically criticized the Fed for creating a situation in which a potential US downturn could become more severe due to the domestic debt build-up encouraged by monetary ease. It had also warned about increasing speculation, pointing to a rising volume of leverage in domestic and international financial systems in 2002 that was fueling the credit expansion. In addition, it published research establishing a link between asset bubbles and excessive credit growth (BIS 2002, 2003, 2004; Borio and Lowe 2002).

Less than a month after Greenspan's confession of puzzlement, a major sell-off in bond markets introduced a stress test for a widening circle of leveraged investors. But, continuing to ignore the BIS' warnings, the Fed and other leading central banks made no effort to address the troubling link between excess liquidity and debt-financed speculation. Indeed, that link and the even more problematic connection between liquidity and credit growth had seemingly slipped below their radar screens. Oblivious to the final link in that chain – the asset bubbles inflated by debt – and lulled by stable

indicators for wholesale and consumer prices, central banks took no action to deal with the inflation in asset prices.

Capital flows, speculative leverage and credit expansion: Sizable, procyclical capital flows played an important role in weakening the impact of changes in the policy rate on developments in financial markets and the real economy. As noted above, raising the short-term policy rate failed to halt the decline in long-term interest rates in 2004 or prevent a flood of new borrowing that followed in 2005 and 2006. But the Fed's efforts to implement a countercyclical strategy had already failed in earlier periods.

During the recession in the early 1990s, for example, relatively little of the Fed's large infusion of liquidity was transmitted to the real economy. The Fed had successfully lowered interest rates but the search for higher yields by domestic and foreign holders of US assets had prompted capital outflows – mostly to Mexico - that prolonged the recession. Credit growth resumed when the Fed raised interest rates in March 1994 and US and foreign investors returned to US assets, leaving Mexico in crisis.

By the middle of the 1990s, the growth of cross-border carry trade strategies had further undermined the ability of the Fed and other central banks to expand or curtail the transmission of liquidity to their national economies.[1] These strategies, triggered by interest rate differentials on assets denominated in different currencies, increased the amount of leveraged speculation by financial institutions and fueled yet another set of asset bubbles to add to the string that began in Japan in the 1980s, moved through emerging markets in the 1990s and started to afflict the US and other advanced economies at the turn of the century. The pattern that has developed over the last two decades suggests that relying on changes in interest rates as the primary tool of monetary policy can set off procyclical capital flows that tend to reverse the intended result of the action taken. As a result, monetary policy can no longer reliably perform its counter-cyclical function – its *raison d'etre* - and its attempts to do so may even exacerbate instability.

[1] Low interest rates in one national market provided an incentive for carry trade strategies that used borrowings in that currency to fund investments in higher-yielding assets denominated in other currencies.

Throughout 2004 and 2005, for example, borrowing reached truly massive proportions both in the US and abroad. The Fed's measured increases in policy rates had no cooling effect on rising debt levels. In fact, they spurred foreign private inflows into dollar assets at home and abroad by encouraging carry trade strategies based on borrowing low interest rate yen to purchase higher yielding dollar assets. Escalating speculation was reflected in record-breaking growth in borrowing in external banking markets, the great majority of which was channeled to financial institutions and used for position-taking by commercial and investment banks and hedge funds (BIS 2005, 2006).

With capital inflows into the US in 2005 rising to twice the amount needed to finance the current account deficit, the US assumed an *entrepot* function for global markets. Excess inflows into dollar assets triggered sizable outflows for investment in higher-yielding emerging market assets (U.S. Department of Commerce 2006). As an excess of dollars from foreign investment on top of current account surpluses flooded their markets, central banks in those countries responded by buying dollars to brake their conversion into local currencies. While their sterilized intervention strategies helped prevent a buildup in domestic liquidity, they also prevented the appreciation of their currencies.

But, needing to invest the dollars they had acquired, emerging market countries bought US treasury securities and other dollar assets and re-exported the problem back to the US. The accumulation of dollar reserves by these countries augmented the highly liquid conditions in US financial markets, exerting downward pressure on medium and long-term interest rates and fueling another round of capital outflows from the US back to emerging markets as well as a continued borrowing binge by US residents.

While 2005 was an extraordinary year in terms of rising liquidity and debt, the pattern of capital flows that it reflected was not unique to that year. Although net foreign lending in US credit markets averaged about 15 percent of the annual supply of funds from the mid-1990s through 2007 (Federal Reserve *Flow of Funds)* the advent of monetary ease after 2001 introduced a new dynamic: the generation of liquidity through the spill-over effects of leveraged cross-border investment flows. The round-robin nature of these flows constituted a sorcerer's apprentice scenario that was bound to lead to crisis

when uncertainty - from whatever cause - threatened the highly leveraged financial sector's need for funding.

Meanwhile, the rising debt levels of private financial and non-financial sectors were threatening to burst the asset bubbles they had created. The housing bubble that had become apparent in the US and was to burst in the second half of 2007 had been fueled by an extraordinary growth in debt with outstanding credit reaching 352.6 percent of GDP by year-end 2007, up from 255.3 percent in 1997. The rise in household debt over the same decade (from 66.1 to 99.9 percent of GDP) was both a key indicator of the debt bubble and of the growing threat it posed for future spending as debt service took a larger share of disposable income. But the most dramatic development was the jump in the debt of the financial sector to 113.8 percent of GDP from 63.8 percent only a decade earlier (Ibid.). While the increased borrowing by financial institutions signaled rising speculation, it also reflected the new funding strategies adopted by a profoundly changed financial system. Those changes and their implications for monetary policy implementation constituted another critical development the Fed ignored.

Part II. The Slipping Transmission Belt for Monetary Policy

Savings shift from banks to institutional investors: Over the past 30 years, the US financial system has been transformed by a shift in household savings from banks to pension and mutual funds and other institutional investment pools. Between 1977 and year-end 2007, the assets of all depository institutions plummeted from 56.3 percent to 23.7 percent of total financial sector assets. Meanwhile, spurred in part by the funding requirements of the Employee Retirement Income Security Act (ERISA) of 1974, the assets of pension funds and mutual funds rose from 21.0 percent to 37.8 percent as these institutional investment pools came to provide the dominant channels for household saving and investment flows. [2] At yearend 2007, pension funds held $10.7 trillion of financial assets (including equities) and mutual funds' holdings of money market instruments, stocks and bonds totaled $11.2 trillion. By contrast, the total assets of

[2] The combined assets of pension and mutual funds as a share of financial sector assets were actually higher in 1997 (42.3 percent) when pension fund assets were 25.7 percent of the total than in 2007 when pension funds' holdings slipped to 18.5 percent.

commercial banks, savings institutions and credit unions amounted to $13.7 trillion (Ibid.).

Borrowing shifts to capital markets: Since the primary assets held by institutional investors are securities, the shift in individual savings from banks to pension and mutual funds produced a symmetrical increase in business borrowing through capital markets. Credit flows to individuals also moved into the capital markets as mortgage originators such as banks and brokers bundled individual mortgages into pools and sold securities based on those pools to investors. Government-sponsored enterprises (GSEs) - Fannie Mae, Freddie Mac and federally related mortgage pools - played major roles in facilitating the securitization process. Meanwhile, asset-backed securities (ABS) issuers used securitization techniques to fund car loans and other consumer receivables. In the twenty year period between 1987 and 2007, the assets of GSEs and mortgage pools – primarily holdings of mortgages for single-family housing – rose from $1.0 trillion to $7.6 trillion while assets of ABS issuers jumped from $118.3 billion to $4.2 trillion (Ibid.).

The policy link to the real economy weakens: These shifts in saving and credit flows have radically altered the way the financial sector functions, reducing the role of direct lending in favor of trading, investment and asset management. The impact on the transmission of monetary policy initiatives has been profound and was already evident in 1993. At that time, former-Fed Chairman Greenspan noted that "the fairly direct effect that open market operations once had on the credit flows provided for businesses and home construction is largely dissipated" due to the diminished role of banks, the increase in savings channeled through institutional investors and the growth of securitization. Though Greenspan asserted that "the Federal Reserve can still affect short-term interest rates, and thus have an impact on the cost of borrowing from banks, from other intermediaries, and directly in the capital markets," he acknowledged that "this effect

may be more indirect, take longer, and require larger movements in rates for a given effect on output" (Greenspan 1993, p.3). [3]

The shift to market-based controls: Subsequent events have underscored the accuracy of these remarks. In the almost 15 years since they were made, however, the major central banks have taken no steps to improve the transmission mechanism. On the contrary, they countenanced further innovation and deregulation and promoted the view that market-based solutions – the Basel Agreement on capital requirements, for example – could replace the quantity controls (reserve and liquidity requirements, lending limits and capital controls) that had been targeted for removal by the advocates of liberalization. In the US, reserve requirements have not been removed but they have been substantially lowered and were further weakened as banks replaced deposits with borrowed funds and used sweep accounts and other strategies to diminish the cost of holding non-interest-bearing reserves on their balance sheets.

As a strategy for ensuring that market forces rather than regulations and quantity controls would determine the volume of bank lending, capital requirements became the rationale for – and poster child of - deregulation. But they have subsequently been seen as its Achilles heel because of their focus on the individual institution rather than the system as a whole. William R. White describes this "fallacy of composition" as one that can exacerbate a system-wide problem when recommendations for a sale of assets by one institution in a stressful situation could reduce prices and the value of remaining assets, leaving other institutions weaker (White 2007, p.83). An additional problem is that markets inevitably supply more capital during a boom and less during a downturn. As the BIS acknowledged in 2002, capital requirements impose a strong procyclical bias on bank lending. Moreover, under Basel 2, the weightings for credit risks increase in a downturn – thus depressing the availability and increasing the price of credit – while the opposite occurs in a boom (BIS 2002).

[3] During the same 1993 conference, former Bundesbank Vice President Hans Tietmeyer took a somewhat gloomier view, arguing that: "…changes in the financial markets have generally made it more difficult for monetary policymakers to fulfill their stability mandate…In a number of countries, financial innovation and deregulation have distorted the intermediate targets used in the conduct of monetary policy and have altered the transmission mechanisms for monetary policy to the real economy"(Tietmeyer 1993, p.407)

The missing monetary cushion*:* But these criticisms of the Basel Accord did not foresee the problems that would arise for banks and non-banks in a predominantly market-based system in which capital is the primary cushion against systemic disruption. As a larger share of credit market assets became tradable instruments, the inexorable pressure that trading rules impose on capital when the prices of one or more assets are falling became glaringly apparent in 2008. As assets are marked-to-market, losses are charged against capital and capital is depleted. If holdings are leveraged, margin calls will accelerate the process. In the aftermath of the Bear Stearns, Lehman Brothers and AIG collapses, evidence of the amount of leverage in the system – including derivatives and banks' other off balance sheet positions in special investment vehicles – was a clear indication that the Fed's strategies for providing liquidity would not suffice to moderate the ongoing pressure on asset prices or stem the erosion of capital.

As early as 2002 there could be no doubt that the Fed's ability to effectively mount a countercyclical monetary initiative – the truly monumental contribution to macroeconomic policy that the Fed itself had initiated in the first half of the 20th century (D'Arista 1994) – was on the ropes. In 1913, the boom and bust behavior of the financial sector had galvanized the political will to overcome the objections of bankers by creating a Federal Reserve System to hold the pool of reserves needed to cushion the banking system and the economy. By 1951 – a time when depository institutions held 65 percent of financial sector assets and liabilities – reserve balances accounted for 11.3 percent of bank deposits and amounted to a remarkably comfortable cushion for the financial system that contributed to the financial and economic stability the US enjoyed through the mid-1960s (Federal Reserve *Flow of Funds).*

By year-end 2001, however, reserve balances had shrunk to 0.2 percent of deposits and banks' share of total financial assets and liabilities had fallen to less than half that of the 1950s (*Ibid.).* Both the disappearance of banks' financial hegemony and the virtual disappearance of their reserve balances indicate the extent of the erosion of the Fed's ability to exert a direct effect on bank credit and on credit growth through other, now dominant, channels. The loss of a direct impact on credit has, in turn, removed the leverage the Fed needs for effective countercyclical strategies.

Meanwhile, the reintroduction of a deregulated, procyclical financial system under pressure from bankers in the final decades of the 20th century resulted in a still-unfolding financial crisis that is testing the ability of the Fed to prevent a substantial depletion in financial sector capital. As the stresses generated by the crisis spilled over into the balance sheets of institutional investors, businesses and households, potential sources for augmenting capital narrowed. Thus the Treasury's decision to use funds from the TARP program to supply additional capital to banks set off a stampede of conversions by nonbanks into bank holding companies.

But the focus on rebuilding capital overlooked the fact that, unless the Fed's infusions of liquidity begin to restore confidence and restart the flow of credit, the meltdown in the capital of the financial system is likely to continue, taking the Treasury's (and taxpayers') preferred stock with it. What is needed is a countercyclical cushion like the one reserves provided – a cushion that can be inflated and deflated through the monetary channel. The Fed's inability to rebuild an effective cushion of liquidity to protect capital has intensified the problem.

Part III. Restoring Counter-cyclical Financial and Monetary Strategies

The BIS agenda: In its June 2005 *Annual Report*, the BIS proposed a new framework for macroprudential stabilization that strongly endorsed countercyclical techniques to implement both regulatory and monetary policies. The proposed framework would reintroduce quantitative measures such as liquidity requirements, loan-to-value ratios, collateral requirements, margin requirements and tighter repayment periods.[4] It would also set prudential norms relating to the growth in credit or asset prices and, as BIS economist William R. White argued, "… use monetary and credit data as a basis for resisting financial excesses in general, rather than inflationary pressure in particular" (White 2007, p. 81).[5]

[4] This is a far more sweeping proposal than the modest one belatedly proposed for mortgage lenders by the Fed in December 2007 (Andrews 2007).

[5] White viewed the policy environment at that time as an intellectual turning point and candidly described the professional, institutional and political obstacles to reform on the scale the BIS recommended (White 2007).

This is an ambitious and admirable agenda that represents a 180 degree turn away from the deregulatory and inflation-targeting practices put in place over the two decades following the rise of free market ideology. But, as a proposal to reinstate effective countercyclical strategies, it falls short of what is needed. The quantitative measures it recommends would apply only to banks and not to other financial sectors. Moreover, these mechanisms deal mainly with credit standards governing loans to nonfinancial borrowers, not their financial counterparts. They therefore ignore the distinctive systemic issues and threats that have emerged as a result of changes in financial structure: the rapid growth and enhanced role of sectors other than banking in channeling savings and credit; the extensive linkages among all financial sectors that result from changes in funding strategies; increased leverage and the use of derivatives to hedge positions; and the proliferation of nonpublic, opaque markets that operate without on-time information about the price of transactions and the volume of trading. A new policy framework must take into account all these developments in order to be effective.

An alternative, systemic approach: No plausible scenario suggests the likelihood of banks regaining their once-hegemonic role in credit creation. And no likely series of events promises to diminish substantially the influence of institutional investment pools and capital flows on credit expansion. As a result, any practical effort to rebuild effective countercyclical financial and monetary strategies must establish new channels for exercising monetary and regulatory control over *all* financial institutions. Simply put, banks alone can no longer shoulder the transmission-belt function that links the financial and real sectors of the economy and nonbank financial firms cannot participate meaningfully in transmitting policy initiatives unless they too come under the direct influence of the central bank.

How might such a system be inaugurated? The Fed's sweeping inclusion of all mortgage lenders, state or federally regulated, under the proposed regulations it issued in December 2007 is an important precedent for introducing system-wide requirements and one that acknowledges that omitting any institutional segment would vitiate the intent of its action (Andrews 2007). A systemic approach could use the 1999 Gramm-Leach-Bliley Act's definition of activities deemed financial in nature and apply the same

regulatory and monetary strategies to all entities engaged in a given function to moderate the rise and fall in credit growth.[6] The first step would be to extend the influence of the central bank to the entire financial system by imposing reserve requirements on all sectors and institutions.

Create a reserve system that targets changes in assets, not liabilities: Bringing non-depository institutions under the Fed's monetary control demands significant adjustments to a reserve structure tailored to fit banks' unique role in the financial system. Despite their growing dominance in channeling credit, nonbank financial intermediaries are not designed to engage in money creation. Unlike banks, they do not create new liabilities for customers when they make loans or add assets. Moreover, the liabilities of institutional investors such as pension funds and insurance companies are in longer-term contracts, rendering reserve requirements on those liabilities impractical. In short, the current liability-based system doesn't permit central banks to create and extinguish reserves for nonbank financial firms.

While the proposal outlined here differs from earlier strategies that target assets, the concept of holding reserves against assets is not new.[7] Thomas Palley provides a full exploration of the advantages of asset-based reserve requirements as a tool of stabilization policy and points out that the concept actually embodies a range of real-world experiences, including the current model for US insurance regulation (Palley 2000, 2003).[8] Moreover, the liquidity requirements proposed by the BIS and suggestions that margin requirements be extended to assets other than equities are also examples of quantitative monetary tools that target assets.

The experience of European countries during the Bretton Woods era provides additional examples of asset-based reserve systems - some designed to control overall

[6] Requirements needed to implement those strategies would be imposed only on those portions of a company engaged in financial activities but not those portions conducting nonfinancial operations. Drawing this distinction would strengthen the crucial separation between banking and commerce and prevent commercial entities from making emergency liquidity claims on the lender of last resort.

[7] For other discussions of asset-based reserve requirements, *see* Thurow (1972), Pollin (1993) and D'Arista and Schlesinger (1993).

[8] Although reserves are imposed on insurance companies for soundness purposes (as opposed to conducting monetary policy) and are held by the firms themselves (rather than a public agency), they nonetheless illustrate the feasibility of systematically reserving and classifying institutional investors' assets

credit expansion, others to shield key sectors from cyclical excesses and drought,[9] and still others to increase credit flows to privileged sectors. And as recently as 1979, the Federal Reserve imposed reserve requirements on loans by US banks' foreign branches to their home offices to restrain the run-up in domestic credit fueled by this source of funding.

When applied to nonbank financial institutions, these earlier asset-based reserve systems were used to implement allocative strategies. They required nonbanks to hold reserves on the asset side of their balance sheets as banks do now. Non-interest-bearing reserves could be turned into interest-earning assets by nonbanks only if they were loans to privileged sectors (housing, exports, tourism). If they did not lend to privileged sectors, nonbanks had to hold the reserves as non-interest-bearing loans to the central bank.

Asset-based reserve strategies intended to expand or restrain credit growth were usually applied to banks. In the case of US banks' borrowings from their foreign branches, the reserve requirements were not effective in restraining credit growth since they could not cover loans from the home offices of foreign banks to their US branches. Nevertheless, these strategies were generally effective within national economies in earlier periods and might even have been effective in the US in cases where bank credit fueled the bubble. For example, imposing asset-based reserve requirements on banks' commercial real estate loans in the late 1980s when such loans were rising by over 20 percent a year in New England banks might have prevented the collapse in values that followed.

In the late 1990s, however, asset-based reserve requirements could not be used to defuse the bubble in high tech stocks without imposing reserves on nonbanks since banks do not hold equities on their balance sheets. Moreover, this strategy could not have defused the subsequent bubble in housing if it had not been applied to all financial institutions. By that time, securitization had distributed mortgage lending across the

[9] For example, Sweden required all financial sectors to hold a given percentage of their total portfolio in housing-related assets. Institutions that did not make real estate loans could meet the requirements by purchasing the liabilities of institutions that did. Financial firms that failed to meet the required percentage had to enter the shortfall on their balance sheet as reserves thereby making an interest-free loan to the government rather than an interest-earning loan for housing. Similar strategies for other purposes were used by the Netherlands, the Bank of England, Italy, Switzerland and France (U.S. House of Representatives, 1972, 1976).

entire financial system. Raising reserve requirements on banks' holdings of mortgage-backed securities and mortgage related derivatives would have merely shifted sales of these assets to other investors.

In any event, industry resistance and pressures for deregulation had already doomed these earlier asset-based approaches and the many changes that have occurred in financial markets since the 1970s make it unlikely that those models would fit the current institutional framework. Nevertheless, no other models offer more promising paths for modernizing the Fed's policy tools today. Only by targeting financial firms' assets can a reserve system hope to effectively influence a majority of total credit extended to nonfinancial and financial borrowers and ensure greater balance in the distribution of credit across the business cycle.

Make reserves liabilities, not assets: Creating a reserve system that extends the Fed's influence over the financial system as a whole requires that reserves be issued to and held by financial institutions as liabilities to the central bank. Shifting reserves to the liability side of financial institutions' balance sheets would permit the monetary authority to create and extinguish reserves for both bank and nonbank financial firms. By contrast, the attempt to extend reserve requirements to nonbank institutions under the old framework – with reserves held on the asset side of the balance sheet - would, in fact, have procyclical effects.

For example, if the Fed's objective were to augment the supply of reserves, adding reserves on the asset side of a mutual fund's balance sheet would require it to balance its position by adding liabilities. Because, unlike a bank, it can't *create* liabilities, the mutual fund would have to sell additional shares to customers. If unable to attract additional shareholders, it would have to sell a commensurate amount of assets or sell its reserves to another institution – responses that could either defeat or reduce the expansionary intent of the action. Similarly, if the Fed were attempting to restrain an expansion by extinguishing reserves, the effect on the mutual fund would be to reduce its overall holdings of assets, providing an incentive to buy assets to balance an unchanged liability position – again, defeating the Fed's objective.

In short, using the old asset-based reserve requirement framework developed in the era of bank-based systems would work only as an allocative strategy. It could be introduced as a special intervention to stimulate credit flows to a sector under stress or to defuse bubbles. It might also be used to reduce excessive leverage within the financial system. But as a tool to maintain financial stability on an ongoing basis or to implement countercyclical policies, requiring nonbank financial institutions to hold reserves on the asset side of their balance sheets would undercut the effort to strengthen the monetary authority's systemic influence by extending reserve requirements to all financial sectors.

Employ repurchase agreements as the central bank's primary operating tool and expand the Fed's eligible holdings. Repurchase agreements (repos) allow both the central bank and private financial institutions to buy an asset with an agreement to resell it in a given amount of time. They are an old and proven tool of monetary policy - used by the Fed in transactions with primary dealers since the 1920s - and are ideally structured to allow the Fed to interact with all financial firms on the asset side of their balance sheets in assessing reserve requirements against a broad universe of financial assets. Under the proposed system-wide reserve regime, for example, the Fed could use repos to buy loans, mortgages, commercial paper, government or agency securities or corporate bonds from any of the many institutions that hold these assets – commercial and investment banks, mutual and pension funds, insurance and finance companies, or government sponsored enterprises (GSEs).

While the Fed has already expanded the range of assets it buys or lends against in implementing its recent crisis-management strategies, authorizing it to accept a wide variety of sound assets as backing for repurchase agreements[10] would bring the US central bank closer to the successful practices of other central banks and enable it to

[10] A proposal to broaden the portfolio of assets eligible for purchase by the Fed was offered by former Fed Chairman Marriner S. Eccles during hearings on the Banking Act of 1935. He argued that the Fed should be free to buy "any sound asset" (Eccles 1935, p. 194). Then as now it would eliminate the central bank's need to own a vast amount of Treasury securities. A large stockpile of Treasuries held as backing for reserves and outstanding currency and the even larger holdings of foreign central banks tend to restrict the availability of this risk-free, highly liquid asset for use in private transactions where it is needed as collateral and to support market stability. In the reserve management system proposed here, the Fed could still acquire Treasuries, support Treasury auctions and the market for government securities while releasing a substantial portion of its current holdings for purchase by investors and financial institutions seeking the ultimate safe-haven asset.

exercise monetary control over a much larger assortment of assets than the shrinking universe of reservable deposits that now constitutes its lever for direct influence over credit growth. More importantly, authority to conduct repos in any sound asset would strengthen the Fed's ability to halt runs, moderate crises and curb excessive investment across the entire financial system. It would, in short, restore the Fed's ability to function as a *systemic* lender of last resort as it did when banks were the dominant lenders in credit markets.

Part IV Implementing an Asset-Based Operating System

Implementing an asset-based reserve system would require balance-sheet adjustments for financial firms and the Federal Reserve and changes in the conduct of policy. Figures 1-4 and the accompanying text summarize balance-sheet categories and open market operations under the current reserve system (in which reserves are assessed against bank deposits) and explain how the proposed system (in which reserves are assessed against the assets of all financial institutions) would make policy implementation more effective.

Balance sheet changes. Moving to a system of reserve management that assesses reserves against assets and creates and extinguishes liabilities held as reserves will necessarily involve balance-sheet changes for both financial firms and the Fed. Figures 1(a) and 1(b) show how reserves are booked on the balance sheets of banks and other depository institutions and on the Fed's balance sheet under the current bank-based reserve management system. As discussed, they are carried as assets of depository institutions and liabilities of the Fed.

Figure 1(a): Current Balance Sheet Structures
Depository Institutions

Assets	**Liabilities**
Reserves	Deposits
Loans	Capital
Other	Other

Figure 1(b): Current Balance Sheet Structures

Federal Reserve System

Assets	**Liabilities**
Government securities	Currency in circulation
Repurchase agreements	Bank reserves
Discounts	Government deposits
Foreign exchange reserves	Other

Under the proposed system of universally applied reserve requirements, shown in Figure 2(a), financial institutions would book reserves on the liability side of their balance sheets rather than on the asset side. Shifting reserves from one side of their balance sheet to the other would have important consequences for banks. And booking reserves as liabilities would have implications for the broader financial industry as well.

First, defining reserves as liabilities to the Fed would clarify and make explicit the fact that reserves represent the financial sector's obligation to serve as a transmission belt for policy initiatives intended to affect economic activity.[11] Second, recognizing reserves as liabilities would moot the contentious issue of paying interest on reserves – removing a long-standing sore point for depository institutions while eliminating the expense for taxpayers that was approved in 2008.[12] Finally, defining reserves as financial sector liabilities would eliminate the use of sweep accounts to reduce reserve requirements on demand deposits and bank's use of vault cash as a substitute for reserve accounts with the Fed. Cash holdings are assets, not liabilities. As such, they represent one component of

Figure 2(a): Balance Sheet Structures Using Asset Based Reserve Requirements

[11] Defining reserves as liabilities to the Fed would finally, if belatedly, achieve a fuller measure of consistency between the central bank's balance sheet and its actual operations. During the drafting of the Federal Reserve Act, lawmakers forged a political compromise with the banking industry that made the new monetary authority appear to be nothing more than a bankers' bank – a repository for the reserves banks would pay into the system as a safeguard in the event of future financial panics. In this conceptual framework, reserves could legitimately be viewed as a passive type of central bank liability.

Soon after the Fed's establishment, however, the invention of open market operations gave the System the ability to create reserves and exercise a level of influence on financial markets and economic activity not envisioned when the legislation was enacted. Later, the Banking Acts of 1933 and 1935, the Employment Act of 1946, and the Humphrey Hawkins Full Employment and Balanced Growth Act of 1978 fully recognized and ratified this influence. Nevertheless, the Fed has maintained a set of bookkeeping arrangements that continue to treat its assets and liabilities like those of a mere bankers' bank. Defining financial sector reserves as assets of the central bank would modernize these outdated arrangements by confirming that: a) the Fed's major function is to create and extinguish liquidity, and b) it enjoys the unique ability to create the reserves that accomplish this function.

[12] Under an asset-based reserve system, it might be argued that financial institutions should pay interest on reserves to the Fed. However, policy objectives likely would be achieved more efficiently if financial firms simply hold reserves as non-interest-bearing liabilities to the Fed.

Financial Institutions

Assets	**Liabilities**
Loans	Deposits
Bonds	Open market paper
Shares	Loans
Mortgages	Bonds
Treasuries	Shares
Open market paper	Mortgages
Other securities, advances & contracts	Other securities, advances & contracts
Repos & Fed funds	Repos & Fed funds
Cash	Capital
	Reserves

Figure 2(b): Balance Sheet Structures Using Asset Based Reserve Requirements
Federal Reserve System

Assets	**Liabilities**
Financial sector reserves	Notes in circulation
	Government deposits
	Repurchase agreements
	Discounts

the financial sector's total portfolio of assets against which reserves would be held.

Such a shift in booking reserves for financial institutions would require a symmetrical shift in the Fed's balance sheet. As Figure 2(b) shows, bank reserves - now held on the Fed's liability side – would be recorded on its asset side together with the reserves of all other financial institutions. Meanwhile, repurchase agreements and discounts would move from the asset to the liability side of the Fed's balance sheet to reflect the central bank's liability for the private sector assets it acquires when it creates reserves. Foreign exchange assets (international reserves) also would become liabilities rather than assets since they too would be acquired through repurchase agreements. Outstanding currency would remain a liability, manifesting the delegation to the Fed of Congress' constitutional authority to create money and manage its value.

As a result of this rearrangement, financial sector reserves would constitute the Fed's only assets under the proposed system. The central bank would no longer hold a huge portfolio of government securities as backing for Federal Reserve notes, bank reserves and government deposits, ending the fiction that one government obligation is needed as backing for another. This would mean, however, that the Fed would no longer earn interest on its assets, and, with non-interest-earning reserves backing its repurchase agreements and discounts, the central bank would no longer have income to pay interest

on its purchases. Nevertheless, the invaluable interest-free liabilities financial institutions would receive when they sell their assets to the central bank under repurchase agreements supports the argument for compensating the central bank for its role in creating liquidity by allowing it to receive earnings on the collateral backing those repos as private financial borrowers do now.[13]

[13] If the Fed kept the earnings on financial assets held under repurchase agreements, that income – along with fees for clearing and other services – should prove sufficient for it to continue operating at or near current levels of expenditure. It is highly unlikely that income from this source would be insufficient but, if it were, the Fed, like all other government agencies, would receive supplementary funding through the appropriations process. While this might be seen as an assault on the post-WW II assumption that central banks must be free of political influence, that assumption should be revisited in the light of recent events and of the Fed's unique role as an agency to which Congress has delegated its Constitutional responsibilities.

Implementing policy under the current reserve management system.. Figure 3 shows the current balance sheet changes that result for monetary policy initiatives. As discussed, the Fed's acquisition of assets (government securities, repos, discounts or loans) results in a symmetrical increase in bank reserves on the liability side of its balance sheet. Adding reserves to the asset side of depository institutions' balance sheet allows them to create new liabilities (deposits) by making loans. Similarly, the Fed's sales of assets reduce reserves and the loss of reserves on the asset side of banks' balance sheets theoretically forces them to reduce deposits by selling assets.

Currently, however, depository institutions need not and do not reduce their overall liabilities or sell assets when they lose reserves. They can substitute borrowings under repo agreements with other financial institutions for deposits and add, rather than subtract, assets – especially if policy rate increases attract foreign inflows that increase the availability of credit. This weakening of the effect of changes in outstanding reserves may also result in little change in banks' balance sheets when the Fed attempts to expand credit by adding reserves. In 2008, for example, banks allowed reserves to pile up as sterile assets – especially after the Fed began to pay interest on them – rather than make loans that would create deposits. With capital eroded by falling prices on their holdings of securities and on the collateral they had posted to back derivatives and other off-balance sheet commitments and borrowings, banks had lost confidence not only in their counterparties, but in their ability to manage their own balance sheets to preserve capital. Moreover, given the need to raise $1 of new capital to back every $12 dollars of new loans, the fact that reserves are not subject to the weightings of capital requirements and that they (unlike other assets) retain their face value increased the likelihood that banks would begin to hoard reserves.

Figure 3: Current Open Market Operations

Depository Institutions		**Federal Reserve System**	
Asset s	**Liabilities**	**Asset s**	**Liabilities**
EXPANSION			
		1) + Government securities (or repos or discounts)	1) + Bank reserves
2) + Reserves			
3) + Loans	3) + Deposits		
CONTRACTION			
		1) - Government securities (or repos or discounts)	1) - Bank reserves
2) – Reserves			
3) – Loans	3) – Deposits		

Implementing an expansionary policy under the proposed reserve management system. To implement an expansionary policy under the proposed operating system, the Fed would add to reserves by engaging in a repurchase agreement with a financial institution. The expansion of reserves would occur in two steps as shown in Figure 4.

Figure 4: Open Market Operations Using Asset-Based Reserve Requirements

	Financial Institutions		Federal Reserve System	
	Assets	**Liabilities**	**Assets**	**Liabilities**
EXPANSION				
STEP 1	1000	900 (to customers, investors, lenders) 100 reserves	100 reserves	100 (cash, deposits, repos & discounts)
	1000	1000	100	100
STEP 2	- 1 asset		+ 1 reserve	+ 1 repo
	+ 1 repo	+ 1 reserve		
	1000	1001	101	101
STEP 3	+ 10 assets	+ 9 liabilities (to customers, investors, lenders)		
	1010	1010		
CONTRACTION				
STEP 1	1000	900 (to customers, investors, lenders) 100 reserves	100 reserves	100 (cash, deposits, repos $ discounts
	1000	1000	100	100
STEP 2	- 1 repo		- 1 reserve	- 1 repo
	+ 1 asset	- 1 reserve		
	1000	999	99	99
STEP 3	-10 assets	- 9 customer liabilities		
	990	990		

1). The central bank buys as asset from a financial institution – for example, GE capital, Fannie Mae, Met Life of JP Morgan Chase – agreeing to resell the asset in a designated period of time. The Fed pays for the asset by crediting the seller's reserve account with its local Federal Reserve bank. In the example depicted in Fugure 4, the Fed has added $1 of liabilities to its balance sheet (the repo) and created $1 of assets (financial sector reserves).[14]

On the asset side of the financial institution's balance sheet, the transaction is a wash; the addition of a $1 repurchase agreement offsets the sale of $1 of assets to the Fed. However, the repo with the Fed (unlike the asset acquired by the Fed) does not bear interest. Meanwhile, on the liability side of its balance sheet, the financial institution has gained $1 of interest-free reserves.

2). Assuming a fractional reserve requirement of ten percent, the addition of $1 of reserve liabilities makes it possible for the financial institution to support $10 of additional assets and to do so by acquiring only $9 of additional liabilities from customers. Even if it were unable to attract the additional liabilities from customers, the financial institution would need to buy $1 of assets to balance its accounts.

[14] Incidental to the transaction – and therefore not shown in Figure 4 – the Fed receives interest or earnings on the asset it bought through the repurchase agreement.

As is the case under the current operating procedures, reserves would be distributed throughout the financial system by means of purchases and sales among the private institutions in the federal funds market. The system may not maximize the expansionary potential of the reserve increase due to the voluntary nature of this process. But the addition of a given amount of interest-free liabilities would provide a powerful incentive – nothing to lose and more earnings to gain – for financial institutions to acquire income-producing assets and lead to a fairly predictable increase in credit.

By providing this incentive, the proposed reserve management system would, as discussed, remedy a major flaw in the existing model. Under the current system, the Fed can push on a string, creating excess reserves that aren't used in the kind of credit crunch that developed during the 1990-91 recession and again in 2008. Under the proposed system, string turns into stimulus.

In a deflationary environment, this change could prove the difference between recovery and prolonged recession. With the tools available in the proposed system, the Fed could create reserves to encourage cancellations of non-performing debts and debt securities, allowing the financial sector to replace them with earning assets. This would channel liquidity directly to households and businesses, helping avoid the stagnation that develops when financial institutions resist issuing new credit and cannot cancel debt for troubled borrowers without jeopardizing their own survival. By thus strengthening private sector balance sheets, monetary policy could powerfully reinforce fiscal initiatives designed to revive demand and investment.

Implementing a contractionary policy under the proposed system. As Figure 4 shows, the Fed would allow repurchase agreements to mature without renewal or engage in reverse repurchase agreements, causing a reduction in outstanding reserves. This would take place in a two step process as follows:

1). The Fed extinguishes its liability to the seller of the repo by returning the collateral and debiting the financial institution's reserve account. Thus the central bank reduces its balance sheet by $1 of liabilities (repos) and $1 of assets (reserves).
The financial institution has exchanged $1 of non-interest-bearing assets (the repo with the Fed) for $1 of interest-bearing assets (the collateral for the repo). The amount of its assets has not changed but it has lost $1 of non-interest-bearing liabilities (the reserve deposit).

2). The loss of a $1 reserve deposit requires the institution to sell assets equal to a given multiple of the fractional reserve requirement. If the requirement is 10 percent, it must sell $10 of assets and reduce its liabilities to customers by $9.

Again, a change in the supply of reserves triggers adjustments that ripple throughout the financial system via the federal funds market. At the end of the process, contraction will have occurred in both the total supply of credit and the value of total credit market assets.

Implications for the conduct of policy: Under the proposed reserve management system, the Fed's method of implementing expansionary and contractionary monetary policies would closely parallel its current implementation process in three significant ways. The central bank would continue to buy and sell financial assets in transactions with private financial institutions. The Fed's actions would still have the effect of simultaneously changing the amounts of its own assets and liabilities as well as those of private financial institutions. Moreover, reserves would continue to be distributed throughout the financial system by means of purchases and sales among private institutions in the federal funds market. The Fed would also continue to have the (little-used) power to change reserve requirements, raising or lowering the amount of reserves needed to back one or more (or all) classes of assets as part of either an allocative or stabilization strategy.

Another aspect of current operating procedures that would remain unchanged would be the Fed's ability to influence asset prices. Some have argued that the Fed does not and should not exert such an influence. But the Fed's open market operations already impact asset prices through changes in interest rates and liquidity, both of which trigger portfolio shifts that disseminate the effects throughout asset markets. Though they do so indirectly and, as has been argued, sometimes with unintended results, the Fed's interest rate changes exert profound effects on the value of pension fund assets, mutual fund shares and housing, as recent experience has shown.

In practice, all efforts to conduct monetary policy must take asset-price movements into consideration – at least at some level of the analytical or decision-making process. And, targeted or not, all efforts to conduct monetary policy must influence those price movements. As long as the Fed's basic objectives – sustainable output, low unemployment, stable prices – remain constant, it makes little *philosophical* difference whether policy transmits those influences indirectly (as in the current bank-

centered reserve system) or directly (as in a system-wide reserve regime). The point is to ensure that the process is efficient and produces the intended outcomes.

In practical terms, the Fed's influence on asset markets likely would function far more efficiently under a system-wide reserve regime. With all financial institutions holding reserves and participating in the federal funds market, volatility would decline as a result of those institutions making portfolio adjustments by purchasing and selling reserves rather than assets. This would be particularly important in the event of market disruptions, when forced sales of assets increase downward pressure on prices and financial sector capital and threaten the ability of markets to function. The fact that reserves retain their face value enhances their role as a cushion, ensuring that trades settled by debiting an institution's reserve account with the Fed are accepted with confidence.

Moderating the effects of capital Inflows and outflows: Foreign capital inflows and outflows change the availability and price of credit in domestic markets. Under current operating procedures, the Fed does not – and cannot - directly offset the effects of capital flows on the supply or distribution of credit. It could only change the impact of capital flows if foreigners held the majority of their US investments in bank deposits rather than in Treasury and GSE securities, corporate bonds and stocks. Given this handicap, the central bank cannot play an effective restraining role when foreign inflows or outflows cause substantial shifts in the issuance volume or price level of mortgage or corporate securities or other assets.

In the proposed system-wide reserve regime, using repurchase agreements as the principal operating tool would allow the Fed to respond more effectively to excessive investment or disinvestment of foreign funds in one or more US asset markets. For example, allowing repos backed by holdings of the kinds of assets purchased by foreigners to run off and replacing them with repos in foreign assets would effectively mop up an inflow, leaving reserves, interest rate levels and credit conditions largely unchanged. Alternatively, to counter the contractionary effects of an outflow, the Fed could acquire assets sold by foreign investors, increasing the amount of reserves in the system. Moreover, the Fed's ability to conduct repurchase agreements in foreign

securities would eliminate the central bank's need to hold international reserves as precautionary investments

The benefit of introducing such transactions would be to enhance the Fed's ability to maintain stable conditions in domestic financial markets. But increasing effective US intervention in foreign exchange markets would not necessarily contribute to global stability. The issue of capital flows is complex and contentious. As argued elsewhere, a rising volume of speculative flows in response to interest rate differentials has contributed to widening global imbalances in recent years with results that have underscored the need for international as well as national monetary reform.[15] Nevertheless, the Fed's inability to moderate the impact of capital flows on US credit expansion has exacerbated the problem of global payments imbalances even as it has facilitated the buildup of historic levels of domestic and external debt that have weakened the US economy.

Conclusions

At the end of the day, the main purpose of reinstating quantitative policy tools is to improve monetary control and overall macroeconomic performance. But a reserve management system that creates and extinguishes financial sector liabilities to influence holdings of credit-creating assets is a more efficient channel for monetary control because it can constrain or stimulate specific asset types or institutional sectors and thus deal more effectively with asset bubbles or credit crunches.

In the case of credit crunches, for example, if financial institutions were required to back assets by holding reserve liabilities that hold their face value, a fall in the price of any asset would increase the value of reserves relative to assets and allow intermediaries to buy more of either the affected instruments or other assets. Similarly, an increase in the value of assets without an offsetting increase in the reserve liabilities that back them would force sales that would limit the rate of increase in prices of one or more classes of assets and thus the potential for bubbles to develop. This automatic countercyclical aspect

[15] *See* D'Arista 2008 for a more extensive discussion of these issues.

of the system would do more to moderate movements in asset prices than changes in interest rates or margin or capital requirements.

Last, but certainly not least, a system-wide reserve management regime would give all financial institutions direct access to the lender-of-last-resort. For example, if mutual funds faced runs by shareholders, they could avoid selling assets (and thus prevent downward pressure on prices) by transferring assets to the Fed under repurchase agreements and acquiring reserves needed to offset customers' withdrawals. Of course, the Fed would, as now, act in that capacity at its own discretion. But it would not need to jawbone the banks to lend to others the funds it traditionally loaned primarily to them to address systemic disruptions.

If it were bundled with complementary reforms in prudential supervision and regulation and a much-needed overhaul of financial sector guarantees, the comprehensive lender-or-last-resort facilities achievable under the proposed reserve regime would make the Fed's crisis interventions more coherent, less costly and, hopefully, less necessary. Like the other benefits of the system proposed in this paper, this improvement in crisis-management technique and strategy would begin forging a policy framework that can deal more effectively with the current crisis and rebuild a financial system that will, once again, promote sustainable growth.

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