

**Final Conference Draft**

**MONETARY POLICY IN AN ERA OF FINANCIAL DEREGULATION AND  
INNOVATION**

**Abstract**

Discussion of the so-called “new economy” has centered on technology and its impact on productivity. However, an equally important development has been financial innovation and deregulation, which has changed the behavior and institutional structure of financial markets. This paper explores the implications of these changes for the conduct of monetary policy. Financial innovation and deregulation have increased the elasticity of private production of money. This empirical development is consistent with the theory of endogenous money, and decisively rejects Monetarist policy recommendations of targeting monetary aggregates. Rejection of a money supply approach to policy then raises questions of how interest rate policy should be guided. The paper argues for inflation targeting, but maintains that inflation targeting is insufficient and must be paired with private sector balance sheet regulation that guards against asset market instabilities. Interest rate policy alone is insufficient because a single instrument cannot hit multiple targets. Furthermore, using interest rates to control asset markets risks inflicting significant collateral damage on the rest of the economy. Consequently, there is a place for quantitative balance sheet controls, and the paper advocates use of asset based reserve requirements.

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## **Introduction: the new policy context of rapid financial innovation and deregulation**

The last twenty years have seen massive financial market deregulation and financial innovation that has changed the landscape of financial markets. This process of innovation and de-regulation has changed the choice sets available to financial market participants, which in turn has generated changed behaviors and market patterns. The modern trend in innovation began in the late 1950's with the creation of the euro-dollar market, which enabled financial market participants to escape reserve requirements. Since then, new products such as overnight repurchase agreements and money market funds have continued this trend. The result has been a decline in the significance of traditional bank deposits held for transactions purposes. Another more recent innovation has been loan securitization, which has enabled banks to bundle and sell-off loans, thereby allowing them to continuously re-liquify their balance sheets and avoid getting loaned up over the course of the business cycle. A third innovation has been home-equity lending, which has enabled homeowners to borrow against previously illiquid housing wealth. Finally, accompanying these innovations has been a shift in the composition of household portfolios toward increased wealth demand for equities.

At the regulatory level, the elimination of the Glass-Steagal law has effectively ended regulatory distinctions between financial intermediaries (FIs), with all FIs now being allowed to provide all types of financial services. A second major regulatory change has been the elimination of restrictions on national banking, which has promoted a shift from branch and state based banking toward nationally based banking.

From a policy perspective, the significance of these developments is that they have dramatically changed the context in which monetary policy is conducted, introducing new sources of disturbances and new channels of monetary transmission. Consequently, what worked in the past may now be increasingly inadequate. The current paper outlines a framework for monetary policy that emphasizes both interest rate policy and financial intermediary balance sheet regulation. It is argued that both are needed in today's financial environment. Interest rate policy should be located within a framework of inflation targeting, and used to attain the

minimum unemployment rate of inflation (MURI). Balance sheet regulation is needed to control for the heightened possibility of financial instability resulting from the increased elasticity of private money production caused by financial innovation and deregulation.

### **Money supply versus interest rate targets: lessons from an earlier debate**

The historic debate in monetary policy has been over whether central banks should focus on interest rates or the money supply in their attempts to influence economic activity. Financial deregulation and innovation are directly relevant to this long standing debate which dates back to the monetarist controversy of the 1960s. Keynesians tended to argue for an interest rate focus, while monetarists advocated a money supply focus. The latter argued that the business cycle was principally driven by money supply fluctuations caused by central banks, and central banks should therefore aim to have the money supply grow in steady predictable fashion. (Friedman and Schwarz, 1963a, 1963b).

This debate is now largely settled in favor of focusing on interest rates. Central banks are counseled to use interest rates as their primary instrument of control, adjusting rates in response to changed macroeconomic conditions. Apart from a few diehards at the Bundesbank and the European Central Bank, most central banks now appear to pay little heed to the evolution of money supply aggregates. The reasons for this outcome are empirical and pragmatic. First, the interest rate volatility associated with the Thatcher - Volker monetarist experiments of late 1970s and early 1980s made for a difficult business investment environment. Second, understanding the significance of monetary aggregates became increasingly difficult owing to a progressive breakdown in the empirical relations between monetary aggregates, real economic activity, and inflation. This breakdown was rationalized by Charles Goodhart under Goodhart's law, which states that every time a monetary authority tries to target a particular monetary aggregate, previously stable empirical relationships between that aggregate and economic activity will break down.

The economics profession has rationalized the retreat from monetarist policy in terms of

an unsatisfying money demand story.<sup>1</sup> The argument is that money demand became increasingly volatile and unpredictable, thereby making monetary targets inappropriate. This rationalization is predicated on Poole's (1970) seminal stochastic ISLM model in which money demand uncertainty is best dealt with by targeting interest rates.<sup>2</sup>

This money demand story represents a case of reaching a correct conclusion on the basis of wrong reasoning. Money is an I.O.U. - a dollar bill is an I.O.U. from the government, while a bank checking account is an I.O.U. from a bank. The private sector has always been capable of creating I.O.U.s, and it has become even more so owing to financial innovation and deregulation. Money supply targeting represents an attempt by central banks to control private sector I.O.U. creation through control over either short term interest rates or the monetary base. However, such targeting is bound to fail since controlling one type of I.O.U. (eg. M1) merely induces a shift into creation of other types. This is the analytic foundation of Goodhart's law. It is also the foundation of the Post Keynesian theory of the endogenous money supply in which bank lending drives the money supply (Moore, 1988; Palley, 1987/8, 1994a).

An endogenous money supply perspective provides a clear theoretical explanation of the well-documented breakdown of empirical relationships between monetary aggregates and economic activity. Financial innovation and deregulation have served to increase the elasticity of private production of money, enabling the financial system to even more easily and quickly escape quantitative monetary constraints that central banks may try to impose through money supply targets. In the immediate post-War era, constraints on the financial system's capacity to create credit money (IOUs) were greater, and the banking was system especially constrained.

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<sup>1</sup>. The canonical paper in this line of explanation is Goldfeld (1976).

<sup>2</sup>. Poole's (1970) paper spawned a cottage industry on the optimal conduct of monetary policy. This literature distinguishes between ultimate targets, intermediate targets, and policy instruments. In a sense, it consists of two literatures. The first explores these issues in the context of Keynesian styled ISLM models, while the second explores them in the context of New Classical macroeconomic models with *ex-ante* labor market clearing and rational expectations. This literature is comprehensively surveyed in Friedman (1990).

This led some to believe that monetary policy should target money supply. However, the logic was always flawed, and the financial innovation and deregulation have further exposed these flaws. Reserve requirement collars no longer bind as they have either been escaped or lowered. Non-banks do significant amounts of lending; households have shifted away from bank deposits subject to reserve requirements, and households have also shifted to holding wealth and using transactions media (credit cards) that are free of the reserve requirement net. Lastly, banks have learned how to re-liquify their balance sheets through securitization.

In retrospect, there is considerable irony to the monetarist debates. The monetarist construction of money was always intellectually flawed, and this construction was becoming further detached from reality at the very time that Milton Friedman was initiating the monetarist controversies. The irony is that Friedman is credited with emphasizing market forces, yet his construction of an exogenous controllable money supply failed to recognize the role of market forces in the creation of money. At the very time that he was placing money supply growth targets on the policy agenda, financial innovation already had financial markets embarked in a direction that made such targeting more difficult and less meaningful.

### **NAIRU: a flawed framework for interest rate policy**

Recognition of the endogeneity of money compels a recognition that “effective” monetary policy rests on central bank control of the price of money, i.e interest rate targeting. However, this leaves open the question of how interest rates should be set, which is where the debate over NAIRU or the natural rate of unemployment enters.

Supporters of NAIRU argue that central banks need to raise interest rates as the unemployment rate approaches the NAIRU. The argument is that there exists a minimum rate of unemployment below which inflation starts relentlessly accelerating. The opposing view is that the NAIRU is a fundamentally flawed theoretical framework, and it should be abandoned because it is wrong and leads to deleterious policy making.

With regard to the issue of policy making, the NAIRU would not be a problem if it were identified with a two percent unemployment rate. However, it becomes the cause of significant

economic losses when it is identified with high rates of unemployment. In this case, it can become an effective barrier to full employment. Empirical estimates of NAIRU are extremely volatile which both undermines the practical usefulness of the concept (Staiger, Stock, and Watson, 1997), and these estimates can also make for a “structural unemployment policy trap (Palley, 1999a).”<sup>3</sup> This is because empirical estimates of the NAIRU tend to move lock-step with the actual unemployment rate. This is clearly shown in figure 1 which provides a scatter plot of OECD estimates of country NAIRUs against actual unemployment rates for 23 member countries for the years 1986, 1990, and 1996.<sup>4</sup> The solid line in figure 1 is the regression line associated with the following regression

$$(1) \text{ NAIRU} = 0.54 + 0.915 \text{ ACTUAL} \quad \text{Adj.R}^2 = 0.90 \quad \text{DW} = 2.15$$

(0.33) (0.04)

Figures in parentheses are estimated standard errors. According to equation (1) every one percent point increase in the actual unemployment rate raises the OECD's estimate of the structural unemployment rate by 0.915 percent points. At the theoretical level, the scale of movement in these estimates of the NAIRU over very short time periods is inconsistent with the NAIRU's structural and institutional conception of unemployment. At the policy level, it leads to the danger that every cyclical jump in unemployment gets interpreted as a jump in the NAIRU, so that monetary authorities refrain from using expansionary policy to combat rising unemployment. Such a policy response (or lack of one) can then become self-validating to the extent that prolonged unemployment and demand weakness destroy human, physical, and organizational capital, thereby transforming cyclical unemployment into structural unemployment.

### **Inflation targeting and the minimum unemployment rate of inflation (MURI)**

<sup>3</sup>. The concept of the NAIRU is reviewed in a symposium in the Journal of Economic Perspectives, September - October, 1997. Galbraith (1997) is especially critical of the NAIRU as a framework for policy.

<sup>4</sup>. Sources for data in figure 1 are OECD Economic Outlook, December 1997, and Implementing The OECD Jobs Strategy, February 1997.

If the NAIRU is a flawed framework for situating the monetary policy control problem, this opens the question of what is the right framework. Rather than focusing on labor markets and the unemployment rate, monetary authorities should adopt “forward looking inflation targeting” that is accompanied by “significant discretion.” This recommendation fits with the broad policy program of inflation targeting which has attracted much increased intellectual support over the last several years.<sup>5</sup>

What is the justification for such an approach? A first possible justification is empirical. The argument here is that inflation targeting has resulted in good economic outcomes in those countries where central banks have adopted it as the framework for policy (Mishkin and Posen, 1997; Bernanke et al, 1999). However, this empirical approach leaves open the theoretical justification regarding why inflation targeting works, and what the target should be.

A second justification is in terms of information and institutions. This justification derives from the game-theoretic “rules versus discretion” approach to policy initiated by Kydland and Prescott (1977), and applied to monetary policy by Barro and Gordon (1983). That approach persists with a NAIRU construction of the real economy in which monetary policy cannot systematically impact the equilibrium rate of unemployment, but it represents monetary policy in terms of a non-cooperative game between an opportunistic monetary authority and the general public.<sup>6</sup> In this non-cooperative game-theoretic framework monetary policy can still impact welfare and real outcomes if (1) it increases the variability of inflation, or (2) inflation

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<sup>5</sup>. Mishkin and Posen (1997), Bernanke and Mishkin (1997), and Benanke et al. (1999) represent early proponent presentations for inflation targeting, and have helped put it on the policy front burner.

<sup>6</sup>. Palley (1996, 1998) discusses the political economy of this construction. The mainstream of the economics profession has focused on the distinction between “control-theoretic” and “game-theoretic” approaches to monetary policy. At the base of this distinction is the question of whether the monetary authority is “benevolent” or “opportunistic.” An alternative political economy approach emphasizes “class and sectoral differences of interest.” The balance of political power and institutional arrangements then determine whose interests the monetary authority tilts toward. See also Epstein (1992).

enters as a negative argument in agents' utility functions. Given these conditions, this suggests adoption of transparent, credible monetary institutions and policy arrangements that serve to bind the monetary authority and discourage it from adopting high, variable, and uncertain inflation. Inflation targeting can be viewed as such a policy arrangement, and it is in this light that I interpret Posen's (2002) discussion of the case for inflation targeting, transparency, and accountability.

However, though NAIRU based models may be capable of providing a theoretical justification for inflation targeting, their justification is weak. First, the incorporation of inflation as an argument in the utility function is *ad hoc*. And if a theoretical justification in terms of "shoe leather" costs is given, this suggests a positively sloped rather than a vertical Phillips curve, which would undermine the monetary authority's incentive to behave opportunistically. Second, game-theoretic NAIRU models suggest that binding policy rules - such as the Taylor rule - will work better than publicly announced inflation targeting in which the monetary authority retains significant discretion. If the justification for such discretion is the monetary authority's superior information, it should simply make this information publicly available. Third, NAIRU-based models provide little guidance as to what the inflation target should be. If dis-inflation is costly, they suggest the target should be the current inflation rate. And if there are disutility costs to inflation, they suggest the inflation target should be zero inflation - price stability. Neither of these policy prescriptions are compelling. In sum, by appropriate choice of model assumptions, theoretical NAIRU-based economic models may be able to construct a justification for inflation targeting, but this justification is likely to be highly model specific and non-robust.

The above arguments suggest that the NAIRU framework is not the place to locate a theoretical justification of inflation targeting. This leads to the third approach for justifying inflation targets, which is that there exists a systematic policy-exploitable trade-off between inflation and unemployment. Whereas NAIRU theory says that policy makers cannot buy a lasting lower unemployment rate at the cost of higher inflation, Keynesian Phillips curve theory



says that they can.<sup>7</sup> However, within the traditional Keynesian model with a negatively sloped long run Phillips curve the issue of what constitutes the optimal inflation rate is left hanging on policy maker preferences.<sup>8</sup> Recently, Akerlof et al (2000) have suggested that the Phillips curve may be backward bending if workers have near-rationality about inflation that leads them to ignore it at low levels. Their model is quite similar to that of Rowthorn (1977) who argues for a backward bending Phillips curve because workers ignore very low inflation. Palley (2000a) provides a different explanation of the backward bending Phillips curve, reasoning that workers in depressed industries and firms are willing to accept inflation induced real wage reductions so as to increase employment, but they do so only as long as the reductions are not too severe. Once inflation rises above a threshold level, workers resist real wage reduction, causing inflation to lose its labor market grease effect. The backward bending Phillips curve is shown in figure 2, and it generates a Minimum Unemployment Rate of Inflation (MURI) denoted by  $P^*$  which is associated with an unemployment rate of  $U^*$ . The argument is that the monetary authority should set the MURI as its inflation target.<sup>9</sup>

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<sup>7</sup>. Tobin (1972), Palley (1994b) and Akerlof et al. (1996) provide a micro-founded explanation of the traditional negatively sloped Keynesian Phillips curve that rests on the presence of downward nominal wage rigidity. In this Keynesian approach to the Phillips curve, nominal wages are downwardly rigid. This contrasts with the downward wage “stickiness” of contracting models, such as those by Fischer (1977) and Taylor (1980), in which wages adjust each contract period and are therefore only temporarily downwardly rigid. Taylor’s model obscures this feature by having inflation expectations that have a significant backward looking component, which makes expectations (rather than wages) a source of more lasting stickiness.

<sup>8</sup>. The standard neo-Keynesian approach to optimal inflation worked via a public policy welfare function in which lower unemployment and inflation rates are both goods, so that policy makers have convex indifference curves in unemployment rate - inflation space. The optimal inflation rate is then determined by the tangent of the policy maker’s indifference curve with the Phillips curve. Palley (1996) presents an alternative model in which inflation - unemployment rate preferences differ by economic class, so that the optimal inflation rate differs by economic class. Which inflation rate prevails depends on the degree of influence of each class over the central bank.

<sup>9</sup>. Palley (1998) provides an alternative public finance rationale of why the Phillips curve might be backward bending. The logic is that the distortionary “sand” effects of inflation on money demand and the tax system may come to outweigh the nominal wage grease effects. These sand effects have been emphasized by Feldstein (1979, 1983).

It is worth comparing the difference between a MURI approach to inflation and a NAIRU approach. In the NAIRU framework inflation is an outcome “summary statistic” that describes the state of economic balance. If inflation is increasing, this indicates that the economy is overheating (below the NAIRU), and the monetary authority should tighten. The reverse holds if inflation is falling. Contrastingly, in a MURI framework inflation is an “adjustment mechanism” that facilitates labor market adjustment. If inflation is below the MURI, an increase in inflation will lower the equilibrium unemployment rate. If it is above, it will raise it. Inflation is therefore a mechanism of adjustment - rather than an information variable - that needs to be calibrated optimally.

Just as the NAIRU is an unobservable concept, so too is the MURI. My own hunch is that within the U.S. the MURI lies in a 2 - 5% range, which should serve as the range for guiding inflation targeting. Such targeting should be forward looking, and capable of adjusting to temporary supply side shocks. Thus, it should focus on the core underlying rate of inflation generated by the underlying level of macroeconomic activity. This is where discretion enters. The target should also be public and credible, and all of the arguments discussed above for a transparent credible inflation targeting regime continue to apply in principle within a MURI framework. Monetary policy should avoid creating inflation uncertainty which only generates additional risk premia in financial markets. Finally, a last advantage of the MURI is that it steers clear of the deflation trap and provides an inflation margin that allows for negative real interest rates should the nominal interest rate ever get pushed to zero (Summers, 1991)

### **Why Inflation targeting is insufficient: the problem of asset price and debt bubbles**

The concept of the MURI provides a theoretical framework for situating discussions of inflation targeting, and it shows how interest rate policy should be guided. However, in recent years there has been fairly sizeable asset price inflation which is not accounted for in standard measures of inflation such as the consumer price index. This has raised questions of whether monetary policy should respond to asset price inflation in an inflation targeting regime. This section addresses this question, and identifies three possible responses. (1) The monetary

authority should leave its inflation target unchanged. (2) The monetary authority should modify its measure of inflation to reflect the impact of asset price inflation. (3) Asset price inflation poses an additional problem in monetary control that calls for additional policy instruments. The section argues that this third response is the right one.

The case for leaving inflation targets unchanged is discussed by Bernanke and Gertler (2000). Interestingly, their theoretical approach emphasizes the macroeconomic significance of asset prices which operate through collateral effects. Despite this, asset prices should not influence either the inflation target, and nor should asset prices be a target. The logic of their model is that asset prices impact aggregate demand (AD), and fluctuations in AD drive fluctuations around the NAIRU that in turn drive fluctuations in inflation. Asset prices are therefore only important to the extent that they help predict AD, thereby helping to predict inflation. In effect, asset prices and all the other factors impacting AD, flow into a common funnel that then impacts inflation. The monetary authority should therefore watch AD, and asset prices are useful to the extent that they provide information on the future level of AD. But that is all, and they do not constitute a separate target.<sup>10</sup>

A second response, advocated by Goodhart (2001), is that the measurement of inflation needs to be adjusted to reflect the impact of asset price inflation. This theoretical conclusion fits with earlier work by Alchian and Klein (1973) that reached a similar conclusion. At an empirical level, Bryan et al. (2002) show that the exclusion of asset prices from the U.S. consumer price index understates inflation by about one-quarter percentage point. Goodhart (2001) and Goodhart and Hofmann (2001) then show that asset prices - especially house prices - matter for future price inflation, and they therefore argue that this therefore merits monetary policy responding independently to asset prices.<sup>11</sup> However, such a policy recommendation is potentially problematic in that the monetary authority may now find itself with two targets but only one

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<sup>10</sup>. Mishkin (2001) reaches a similar conclusion.

<sup>11</sup>. Case et al. (2001) also report the significance of housing prices for consumption.

instrument - the interest rate. These considerations point to the need for additional policy instruments, a matter which is taken up below.<sup>12</sup>

A third response is that neither inflation nor the change in the rate of inflation are sufficient to guide monetary policy. This is because economies can incur significant balance-sheet disorders that may build without any immediate effect on inflation, yet these balance-sheet disorders can have huge employment and output costs when they ultimately come to be resolved.<sup>13</sup> Such disorders are short-hand for asset price and debt bubbles, and they may be more likely in today's environment of innovation and deregulated financial markets. This is because innovation and deregulation have increased the elasticity of production of private money. In a sense, they have created "automatic de-stabilizers" that stand in contrast to the old Keynesian notion of "automatic stabilizers". For example, in the household sector home equity loans now allow homeowners to access and spend previously illiquid home equity. Since house prices and home equity are pro-cyclical, this increases the pro-cyclicality of the business cycle. In the business sector, financial innovations such as the junk bond market allow firms to borrow more heavily against assets, and asset prices which determine the value of collateral are pro-cyclical. Finally, in the financial sector, firms are able to avoid getting loaned up because of secondary loan markets in which they can sell loans and re-liquify their balance sheets.<sup>14</sup>

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<sup>12</sup>. This is the classic policy problem identified by Tinbergen (1952).

<sup>13</sup>. Concerns with balance sheet disorders leads to the debt-deflation hypothesis of Irving Fisher (1933) and the financial instability hypothesis of Hyman Minsky (1982). Palley (1994c) presents a speculative consumer debt-driven model of the business cycle. Bernanke, Gertler and Gilchrist (1996) presents an investment deb-driven model of the cycle. Kiyotaki and Moore (1997) present an investment model in a similar spirit. Palley (1999b) explores the problem of deflation in a fix-price Keynesian temporary disequilibrium model with debt.

<sup>14</sup>. The concept of automatic de-stabilizers is introduced in Palley (1999c). Balancing these destabilizing features, innovation and deregulation have also likely provided significant stabilizing gains associated with risk spreading and portfolio diversification. National banking has spread loan risks so that the U.S. no longer suffers regional banking crises such as afflicted it in the 1980s. Secondary loan markets have enabled risk-spreading which reduces the risk of collapse of individual financial intermediaries. Home equity loans have facilitated consumption smoothing and helped sustain consumption in the current economic downturn, while increased access to credit has helped business weather the downturn. These reflections point to the mixed

The problem for policy is that balance sheet disorders are likely to be over-looked if inflation is the sole target or indicator. And if interest rate policy is directed toward asset market and balance sheet management, then it is akin to using a policy blunderbuss that inflicts significant collateral damage on the rest of economy. Moreover, there are also likely to be significant distributional asymmetries regarding who benefits from asset price bubbles and who bears the cost of higher interest rates.

Regarding the inadequacy of inflation indicators, there are a number of reasons why the build-up of balance sheet and asset price disorders may have little impact on inflation. First, asset prices are not counted as part of inflation measures, and the CPI includes neither equity nor home prices. This can be corrected by adding these prices to the CPI, but would in turn complicate the process of wage setting and inflation indexation for purposes of real income protection.<sup>15</sup> Second, in an increasingly globalized economic environment, increased spending generated by asset price and debt bubbles can be accommodated via the trade deficit. Consequently, there may be no impact on the domestic price level, and instead private agents may incur debts to banks who in turn borrow from foreign lenders. Third, the economic dangers of asset price bubbles may be unrelated to aggregate demand and inflation. For instance, increased asset values may be applied as collateral to incur debt which is used to purchase additional assets that pushes asset prices up further. In this case, the result may be an unsustainable debt pyramid that pulls down the entire financial transactions system when it crashes. Fourth, the negative spending impacts of asset price bubbles may be compositional

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nature of the changes. On one hand they have likely improved spreading of diversifiable microeconomic idiosyncratic risks, while on the other they have increased undiversifiable macroeconomic risk.

<sup>15</sup>. Bryan et al. (2002.) Show that including the impact of asset prices on the CPI would raise the rate of inflation by one-quarter percentage point. Since CPI indexation is often used to protect real incomes (as with Social Security), augmenting the CPI to include asset prices could reward persons twice in that they would benefit from the underlying asset price inflation, and they would then get an income adjustment on top of this. Moreover, this double rewarding would of course be skewed toward the wealthy.

rather than aggregate. Thus, asset price bubbles may spur investment spending booms that are founded on distorted perceptions, and when these investments fail there may be significant negative blow-back into the financial system that negatively impacts overall economic activity.

### **Asset Based Reserve Requirements - a solution to the asset and debt bubble problem**

The above considerations point to the need for additional policy instruments that enable the monetary authority to target asset markets while leaving interest rates free to target inflation. Asset based reserve requirements (ABRR) can provide these instruments. The new requirements would be applied across all FIs, reflecting the fact that earlier business line distinctions have now largely disappeared as a result of deregulation and competitive convergence. In this new environment, functional rather than sectoral regulation is called for, and regulation should be conducted on the basis of what companies do rather than what they are called. This ensures a level playing field, and avoids having regulation confer unfair competitive advantage.

The full details of the proposed system are laid out Palley (2000b). The main features are (1) FIs would be required to hold reserve requirements against all assets, though some asset categories could be zero-rated, and (2) reserve requirement ratios could be adjusted at the discretion of the central bank.

Before going into the merits of the proposal, it is worth exploring how the structure of ABRR compares with other forms of balance sheet regulation. This comparison is described in figure 3. The traditional form of reserve requirement - such as applied to bank deposit accounts - is a liabilities based system in which the composition of liabilities determines the level of required reserve holdings. Causation therefore runs from the liabilities side of the balance sheet to the asset side. Collateral requirements, such as margin requirements, are another example of a liabilities based system with the level of debt determining asset holdings.<sup>16</sup> Risk based capital

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<sup>16</sup>. It is interesting to compare collateral and conventional liability based reserve requirements which have banks holding liabilities of the central bank. The latter have the advantage of providing seignorage, and central bank liabilities are also absolutely liquid and subject to zero price risk. Contrastingly, collateral can be subject to considerable price fluctuation, which can make collateral requirements highly pro-cyclical. Thus, prices may fall in slumps, obliging agents to ante up more collateral which they may be unable to do. This can then trigger default.

standards reverse the direction of causation, and have the composition of assets determine the amount of equity (a liability) that firms must hold. Debt-to-equity requirements are a liability-to-liability form of regulation, and they have the level of debt determining a minimum level of equity holding. Finally, ABRR are a form of asset-to-asset regulation. Under the current proposed scheme FIs would be obliged to hold liabilities of the central bank as reserves, but in principle qualifying reserve assets could be broadened to include other high quality liquid assets.

There are a number of merits to the proposed system of ABRR. First, having the reserve requirement ratio vary by asset category would enable the monetary authority to change the relative cost of holding different asset categories by adjusting relative requirements, and this could be done without changing general level of interest rates. For instance, if the monetary authority wanted to discourage equity holdings, it could do so by increasing reserve requirements on equity holdings. Likewise, if it wanted to discourage commercial mortgage borrowing, it could do so by raising the reserve requirement on new commercial mortgages. In effect, the monetary authority would gain  $n-1$  additional policy instruments, where  $n$  is the number of asset classes.

A second merit is that ABRR can be used to promote flows of funds to areas deemed to be socially deserving (Pollin, 1993; Thurow, 1972). Thus, a lower reserve requirement on a particular asset category, such as community development loans, would increase their relative return and attract more funding.

Third, ABRR have good automatic counter-cyclical properties. When asset prices and bank lending increase in booms, this will increase the demand for reserves which will automatically engender monetary tightening. Analogously, when asset prices and bank lending fall in slumps, this automatically releases reserves and contributes to monetary expansion. Moreover, to the extent that modern financial business cycles are driven by expansion and contractions of the asset side of balance sheets, this automatic property attaches directly to the most salient part of the financial transmission mechanism.

Fourth, ABRR promises to yield significant seignorage benefits. Fifth, and finally, ABRR

promise to strengthen monetary policy predicated upon open market operations by re-building the demand for reserves. Recently, Friedman (1999) has speculated that monetary policy could become irrelevant because of diminished demand for reserves, and because lack of a connection between the demand for reserves and economic activity.<sup>17</sup> ABRR can re-establish a robust and strong link between the demand for reserves and economic activity because expansion of financial asset values and quantities is the central financial component of today's economic environment.

### **ABRR versus risk based capital requirements**

Proposing an alternative system of financial regulation invites comparison with the current system of risk based capital standards (RBCS). As noted earlier, a principal difference concerns the way in which balance sheet components link. RBCS rely on an asset-to-liability link, while ABRR work through an asset-to-asset link.

The first advantage of ABRR is that they are counter-cyclical. Contrastingly, RBCS tend to be pro-cyclical. Thus, the quality of assets tends to improve with the cycle which can free up equity capital, and it tends to deteriorate with downturns. This means banks have to find more capital in downturns, which is exactly when it is most difficult to raise capital. This gives FIs an incentive not to make risky loans in recessions, which can contribute to credit crunches. Moreover, when an asset is written-off under ABRR, this releases reserves and is expansionary. And the reverse holds if an asset is written-back. Contrastingly, under RBCS writing-off an asset eliminates equity, and forces banks to find more equity or cut back on risky asset holdings.

A second disadvantage of RBCS is that they are not useful as a tool of discretionary monetary stabilization policy. This is because equity holdings cannot be adjusted with easy flexibility since equity capital is difficult and costly to raise. A third disadvantage is that RBCS yield no seignorage benefits, and nor do they improve the efficacy of monetary policy by

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<sup>17</sup>. Palley (2001) discusses the Friedman hypothesis in terms of the e-money revolution, and concludes that though a demand for reserves will remain it will constitute an increasingly unsatisfactory foundation for conducting monetary policy.



strengthening the robustness and economic connectedness of the demand for reserves.

In sum, ABRR dominate RBCS as a form of quantitative regulation capable of reining in the increased elasticity of private production of money. The new financial landscape calls for more policy instruments that can support interest rate policy focused on managing the general level of economic activity. ABRR can supply these instruments, providing the monetary authority with specific instruments for dealing with asset and debt bubble problems. These new instruments can of course be supplemented with existing instruments. Thus, margin requirements can continue to be of use for purposes of controlling equity markets. Finally, capital standards can also have a place to the extent that moral hazard is viewed as the predominant problem. However, such standards are not appropriate as an instrument of stabilization policy.<sup>18</sup>

### **Inflation targeting and the danger of asset market moral hazard**

The above sections have argued for a two pronged approach to monetary policy that uses interest rate policy to target inflation, and asset based reserve requirements to manage the problem of asset price and debt bubbles. This section concludes the paper by examining how reliance on just inflation targeting and failure to apply asset market regulation, risks creating moral hazard in asset markets. The underlying cause of the moral hazard is that asset prices may rise considerably during periods of expansion without necessarily inducing inflation and a tightening response from the monetary authority. However, once the expansion comes to an end, asset prices stand exposed. At this stage a significant downward correction of asset prices risks significant negative consequences. Falling prices could trigger margin and collateral calls, and if debtors are unable to meet these calls, the result could be a wave of bankruptcies and a freezing-up of new lending. By reducing collateral values, falling asset prices also make it harder to get new loans. Falling asset prices also make it harder to assess the value of new investment projects, particularly those in areas such as construction. Finally, falling asset prices may strike at

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<sup>18</sup>. Tobin (1998) has also suggested modernizing the Federal Reserve's balance sheet by allowing it to buy and sell corporate equities and bonds. However, this raises concerns about backdoor nationalization and favoring some companies over others in terms of credit access.

consumer confidence just when maintaining confidence is critical to aggregate demand.

Such considerations suggest that the monetary authority will have an interest in actively preventing asset prices from falling. Thus, whereas the monetary authority may pay little explicit heed during the upturn, it steps in to protect values during the downturn. Indeed, this may well characterize Federal Reserve policy during 2001. *Prima facie*, the mildness of the recession and the relative stability of inflation did not call for as rapid and dramatic interest rate reductions as actually happened, suggesting that the Fed may have been guided by a desire to maintain asset prices and avoid an equity market melt-down.

The Fed was almost certainly right to pursue this policy, since under the existing system the Fed needs to keep asset prices up in a downturn. However, it is suggestive of the ultimate expression of “too big to fail,” and the moral hazard is clear. Under inflation targeting the Fed may have no cause to actively prevent asset price inflation on the way up, but then find itself compelled to limit asset price declines on the way down. The message to investors is take advantage of this asymmetric policy posture and hold flex-price assets, which sets the stage for bigger future asset price bubbles.

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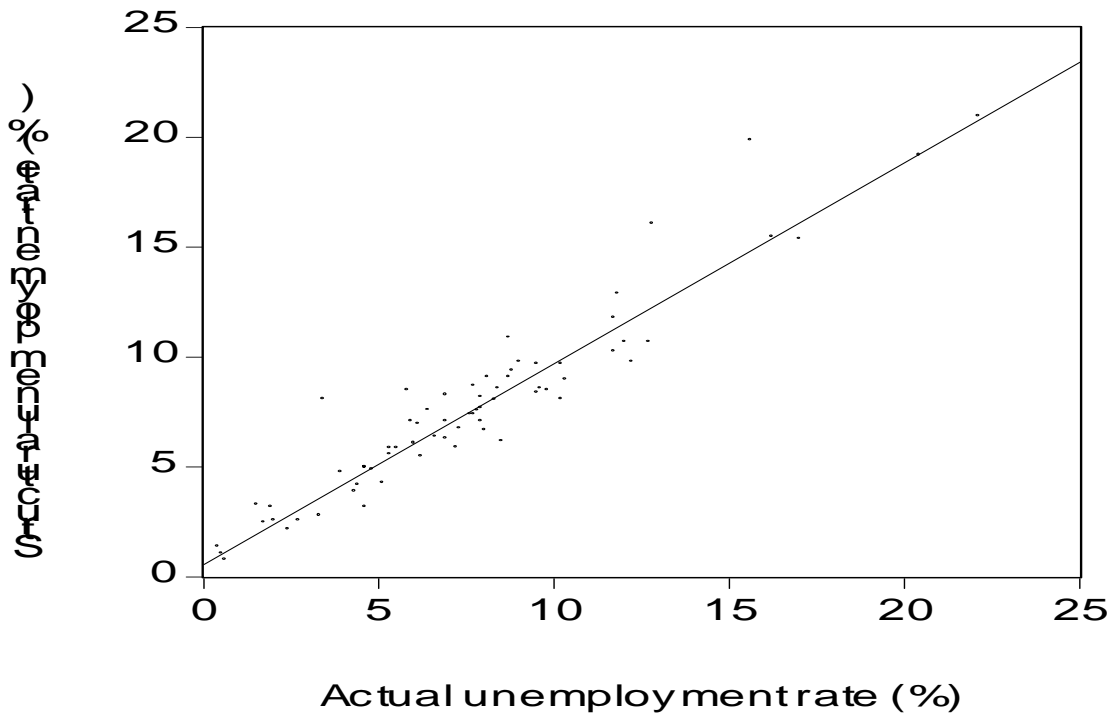
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Figure 1 Country actual and structural unemployment rates according to the OECD for 1986, 1990, and 1996.



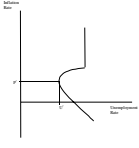


Figure 7 The dependence of the molecular weight of the polymer on the temperature of the reaction.



Liabilities ----->----->-----> Assets  
[Reserve requirements on deposits, collateral requirements, margin requirements]

Assets ----->----->-----> Liabilities  
[Risk based capital standards]

Liabilities ----->----->-----> Liabilities  
[Debt-to-equity requirements]

Assets ----->----->-----> Assets  
[Asset based reserve requirements]

Figure 3 Different structures of balance sheet regulation. Arrows represent direction of causation.