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Asset Prices, Financial Fragility, and Central Banking

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ABSTRACT

The paper reviews the current literature on the subject in both the New Consensus and the Post Keynesian framework. It shows that both approaches give to central banks a wrong goal (inflation, distribution, curbing speculation, etc.) and a wrong instrument (interest rate rule). The paper claims that central banks should focus their attention on maintaining financial stability and leave other problems to public institutions better suited for this task. In doing so they should develop new tools of intervention and leave policy interest rates unchanged, close to or at zero percent. Central banks have been created to deal with financial matters (government finance and financial stability) and should stick to this. Central banks, then, have a large amount of improvements to make, both as reformers and as guides for the financial community. Their main instrument should be an analysis of the financial fragility of the financial system and of the different economic sectors. In this context, it is shown that the notion of "bubble" does not matter for policy purposes, and that the current regulatory system lacks an institution that is able to deal effectively with solvency crisis.

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For most contemporaneous economists, the main goal of a central bank should be price stability, meaning a low and stable inflation rate. Financial management, regulation, and supervision are "additional" concerns that come about rarely and are the "prophetical" element or "extension" of monetary policy (Greenspan 1996). This role of central banking has always been more or less strongly shared, but, with the emergence of the New Neoclassical Synthesis in academia, output-price stability has become the overriding goal. In this context, the recent bubble period of the 1990s has raised concerns in the New Consensus about what a central bank can do in the management of asset prices and financial matters.

The Post Keynesian tradition, because of a different theoretical framework, has been more aware of the importance of the financial side of the economy. However, the policy proposals that come out of this framework are sometimes surprisingly similar to the New Neoclassical Synthesis. True, the goals are usually different — going from distribution, or demand management to speculation management, but the end results is still a proposition of a sort of interest-rate rule in which expectations of inflation may be important, leading to a kind of inflation targeting framework. However, other Post Keynesians include the central bank in the broader goal of promoting a stable full-employment environment and give to it the role of ensuring financial stability. This difference of view regarding the appropriate goals also applies in terms of instrument of intervention.

The position taken in this paper is that financial stability should be the unique goal of a central bank and that inflation, distribution, employment, and other public institutions should deal with growth. Central banks have been created to take care of financial matters, not price stabilization, distribution, or the fine-tuning of economic activity, and it is only recently that their role has been dramatically changed (Goodhart 1988). This leads us to also reject the use of interest rates by the central bank as a good operating tool. A more direct intervention in the financial sector is necessary.

The first part of the paper reviews the position of the New Consensus on the matter. The second part reviews the Post Keynesian position. The third part criticizes the use of interest rate in the Post Keynesian approach (a criticism of the use of interest rate in the New Consensus has been provided elsewhere (Tymoigne 2005)), and looks at the implication of taking financial stability as the main goal for a central bank.

1. THE NEW CONSENSUS

Both the long-term neutrality of money and the existence of frictions in the markets are essential for the New Consensus. They provide a justification for the role given to the central bank in the short-term and long-term management of inflation. Because real rates of return are assumed to be what matter for entrepreneurs and financial market participants, who are at the center of the economic dynamics, inflation should be the central preoccupation of the government. Because excessive monetary creation is the main source of inflation, monetary authorities have to be given the objective to manage inflation by managing the money supply directly (money-supply targeting) or indirectly (interest-rate targeting). Once monetary authorities have been able to maintain a low and stable level of inflation, they must not concentrate their policy on other objectives like, for example, promoting economic growth. Indeed, once the government has compensated for possible frictions, the economy naturally tends toward its optimal growth rate. If the government tries to intervene, it will generate inflationary pressures and, therefore, fluctuations in the expected real rates relative to the required real rate.

1.1. The Role of Monetary Policy in the New Consensus

This leads to a monetary-policy framework called “Inflation Targeting” which is characterized by “the announcement of official target ranges for the inflation rate at one or more horizons, and by explicit acknowledgement that low and stable inflation is the overriding goal of monetary policy” (Bernanke and Mishkin 1997). Practically, this means that Inflation Targeting is a framework of decisions for central bankers — discretion is still possible to accommodate for output stabilization, financial stability, and exchange rate problems, but it is a “constrained discretion” (Bernanke and Mishkin 1997). This can be done, for example, by allowing short-term inflation to be off-target or by having a wider range for the inflation target. Another way to accommodate for short-term problems is by having a definition of inflation that excludes supply shocks, volatile prices, and other distorting elements — central banks usually use an adjusted-CPI for their decisions (Bernanke and Mishkin 1997).

The aim of the central bank is, then, to target inflation by trying to control expectations of inflation in order to stabilize real interest rates. Remember that, in the context of Fisher's first approximation, at the macroeconomic level, it is assumed that at equilibrium:

$$r^* = i - E(\pi)$$

Required real rate and real rates are equal. Thus, a central bank should change its short-term interest rates each time its long-term expectations of inflation change, even if today there is no sign of inflation at all:

> Monetary authorities need to be brave in the face of uncertainty, and be prepared to vary interest rates earlier and more violently than their natural caution would normally entertain. (Goodhart 1992)

By changing its short-term rate, the central bank will directly affect the other short-term rates and indirectly affect (*via* expectations of future monetary policy decisions) long-term rates, allowing i to compensate for changes in $E(\pi)$.

1.2. Inflation Targeting, Asset Prices and Financial Fragility

This literature can be divided in three different parts that, overall, argue that asset prices should not be included in the daily concerns of central bankers if they do not improve the expectations of output-price inflation and economic growth. The first part of the literature studies the relationship between price stability and financial stability. The second part of the literature wonders if it is necessary to include asset prices in the daily considerations of central bankers (or in the monetary policy rule if no discretion is allowed). The third part of the literature goes beyond the simple inflation-targeting framework and studies the appropriate use of asset prices by the central bank for financial stability.

1.2.1. Price Stability and Financial Stability

There are two positions in the New Consensus regarding the relationship between price stability and financial stability. The first one argues that price stability guarantees financial stability, so that monetary policy should not be preoccupied with financial stability, and so asset prices, in its daily operations. Only when financial crisis occurs, which is very rare according to those authors, should the central bank intervene by acting as lender of last resort. The second position argues that price stability can trigger financial instability; therefore, the central bank needs to be aware of the financial condition of the economic system in its daily operations. In the latter case, asset prices have an active role to play in the monetary-policy making.

Price Stability Generates Financial Stability: Schwartz (1988, 1998) has recently been the main advocate of this position. Relying on an earlier work with Friedman (Friedman and Schwartz 1963), she argues that inflation is the major threat to financial stability, especially for the banking sector. More precisely, she argues that high *unexpected* changes in the rate of inflation or price level generate financial instability:

> The reason that price instability confounds financial stability is related to the way financial institutions conduct their credit analysis. […] The lender bases both the estimate of a would-be borrower's balance sheet ratios and the valuation of collateral on his presumption of the continuation for the life of the loan of the current price level or inflation rate. Unexpected changes in the price level or inflation rate can invalidate the assumptions on which the loan was based. […] The original price level and inflation rate assumptions are no longer valid. The change in monetary policy makes rate of return calculations on the yield of projects, based on the initial price assumptions of both lenders and borrowers, unrealizable. Borrowers lose the sums they have invested. Lenders have to contend with loses on loans. (Schwarz 1998)

In this framework, Schwartz states that both lenders and borrowers live in the same state of uncertainty when they evaluate a project, so "asymmetric information is not the problem confronting lenders and borrowers" (Schwarz 1998). The problem is that monetary authorities vainly try to stimulate the economy above its natural path which generates inflation. By generating persistent high inflation, the central bank encourages optimistic expectations of nominal income by lenders and borrowers. Thus, the economy becomes more sensitive to changes in the inflation rate and, during a period of high inflation, even disinflation can be harmful by decreasing the amount of nominal income gains and by increasing the real burden of debt. This is true for both entrepreneurs and bankers whose "perceptions of credit and interest

rate risk on both the upswings and the downswings of price movement" are distorted (Schwartz 1988).

Therefore, by promoting price stability, the central bank "will do more for financial stability than reforming deposit insurance or reregulating" (Schwarz 1998). Of course, the price stability policy should be done for a low level of inflation because "the variability of changes in relative prices seems to rise as the overall rate of inflation rises" (Schwartz 1998). By doing this, central banks will promote economic growth and financial stability by decreasing the variability of the nominal rate of interest and by making it easier for banks to access the creditworthiness of borrowers. Thus, lending booms induced by high inflation, and recessions induced by unexpected deflation or disinflation, have less chance to occur.

Bordo, Dueker, and Wheelock (2000) and Bordo and Wheelock (1998) have tested the "Schwartz Hypothesis" that (expected) price stability promotes financial stability. They find a positive "association," not causation, between price instability and financial instability (meaning bank panics) and go on to argue that:

> This circumstantial evidence is largely consistent with the Schwartz Hypothesis. At a minimum, the historical association of severe financial instability with fluctuations in the price level would seem to support the arguments of those who favor a price stability mandate for monetary policy. (Bordo and Wheelock 1998)

Bernanke and Gertler share this view and state that "central banks should view price stability and financial stability as highly complementary and mutually consistent objectives" (Bernanke and Gertler 1999).

Price Stability May Trigger Financial Instability: While adhering to the inflation-targeting framework, some authors have criticized the preceding view. They show that the relationship between price stability and financial stability is not as simple as the preceding view argues.

McGee (2000) and Bean (2003) show that output-price stability and solid growth may lead to the development of bullish expectations in the financial market. The latter, by generating optimistic views about the future and by increasing the value of collateral, may trigger a credit boom that reinforces the bullish financial market. Thus, even if the central bank is successful in

stabilizing prices, it may not be successful in creating financial stability and, on the contrary, may promote financial instability.

Borio and Lowe (2002, 2003) give four reasons why financial stability may not result from price stability. First, a successful monetary policy can improve the optimism of economic agents by improving the possibility of long-term planning. This optimism will transfer to asset prices, particularly real estates, which will transfer to the credit market. The boom in the credit market, by generating looser creditworthiness criteria, may trigger financial instability in the future when borrowers cannot meet their expectations. Second, a positive supply-side shock — for example, an increase in productivity — may increase profitability and optimism about the future. Then "the combination of rising asset prices, strong economic growth and low inflation can lead to overly optimistic expectations in the future, […] [generating] increases in asset and credit markets significantly beyond those justified by the original improvement in productivity" (Borio and Lowe 2002). Third, and this is quite problematic in the Inflation Targeting framework, a highly credible monetary policy may anchor inflation expectations so well that wages and prices of long-term contracts may not respond as fast to demand pressures. This price stickiness may improve the profitability of some enterprises if they can increase their sale prices. In addition, a high confidence in the capacity of the central bank to maintain price stability while limiting economic downturns will decrease the uncertainty about the future and so increase the willingness to borrow and to lend, as well as raise asset prices. In the end, the economic system is more fragile. Finally, related to the previous ideas, inflation expectations may manifest themselves first in lending contracts, even if there is no sign of inflation today: "inflationary pressures first become evident in asset markets, rather than goods markets" (Borio and Lowe 2002). This increases the dependency of borrowers and lenders on the realization of a certain level of inflation. Therefore, in total, if the financial imbalances of the economy are high, the possibility of financial instability triggered by price stability is highly possible.

1.2.2. Should Monetary Policy Take into Account Asset Prices?

The first debate about the role of asset prices for monetary-policy implementation concerns their importance for inflation and output growth smoothing — should the central bank react, by

increasing or decreasing its interest rate, to asset price rises and declines? The answer to this is unanimous among the New Consensus and is summarized by Bernanke and Gertler (1999). There would be two reasons to include asset prices in the decision process of central bankers. First, if misalignments (bubbles) can be identified accurately by the central bank and second, if these misalignments affect current and future inflation or output growth. If asset prices are not driven by fundamentals and if, *via* the transmission mechanisms, they provide relevant information about future inflation and future growth, then it may be useful to include them in the reaction function to "restore the optimal price level" and growth rate (Smet 1997). In 1997, the Bank of International Settlement concluded that asset prices are good indicators of future inflation and output growth. However, for the BIS, they should not be included in the reaction function but should be used as additional indicators for policy formulation. This may be seen as a middle position in the current state of the debate — some authors argue for an inclusion in the reaction function, others are for a "benign neglect" regarding asset prices.

Inclusion of Asset Prices in the Reaction Function of the Central Bank: The first side of the debate argues that inflation targeting would be improved by the inclusion of asset prices in the reaction function of a central bank. This is so because asset-price misalignments, even if they are hard to measure, are measurable by central banks, and because asset prices are reliable indicators of future inflation. Then, the inclusion of asset prices can be done *via* a broader measure of inflation, or *via* a direct inclusion in the reaction function.

Alchian and Klein (1973) were early to argue that asset prices are relevant to improve the measure of expected output-price inflation. Goodhart (1992, 1993) and Goodhart and Hofmann (2000) argue that there is a positive correlation between asset prices and CPI and that the former, especially housing prices, help to predict inflation. Thus, by including asset prices in a broader measure of inflation, called Financial Condition Index, the central bank can improve its inflation targeting and potential output targeting. By tightening or relaxing its policy earlier than in a traditional monetary policy, the central bank will dampen inflation pressures (Goodhart and Hofmann 2001). This policy suggests that the variations of interest rate be larger than current monetary policy, so it would be necessary to protect the banking system (Goodhart 1993). In 2000, the International Monetary Fund published a report that reaches the same conclusion — by including asset prices in a broader measure of inflation, inflation targeting is improved.

The latter position implies that it would be redundant to include asset prices as an additional element in the reaction function of central banks because they would be already included in the inflation measure. However, another group of economists argue that asset prices have their own place in the reaction function. They agree with the preceding authors that asset prices help to predict inflation (Bryan, Cecchetti, and O'Sullivan 2002), especially housing prices, but they want to go further. This position has first been put forward in a 2000 report of the Centre for Economic Policy Research written by Cecchetti, Genberg, Lispky and Wadhanwani, and has been emphasized again in several papers (Cecchetti 2003; Cecchetti et al. 2003). These authors argue that Inflation Targeting is improved by taking into account expected inflation and asset-price misalignments. They recognize that the calculation of price misalignments is difficult, but they consider that they are not harder to calculate than, for example, potential output. In this context, the central bank should react to all asset prices if they are misaligned (Cecchetti et al. 2000). This does not mean that the central bank should target asset prices or try to burst asset bubbles; it only means that the central bank should automatically move its interest rates to respond to asset-price misalignments, with the objective to improve inflation targeting and nothing else. By doing so, the central bank will reduce the variability of inflation and output (Cecchetti et al. 2000). Of course, the central bank should not respond to changes in asset prices if they reflect changes in fundamentals.[1] However, contrary to Goodhart, they do not argue that the Fed should rapidly move its interest rates: "A crucial element of our proposal is that interest rates would move gradually in response to deviations of asset prices from perceived fundamentals" (Cecchetti et al. 2000). Interest rates should move more widely, but not too fast.

Benign Neglect Toward Asset Prices: The other side of the debate regarding the role of asset prices in the normal policy decisions of the central bank views the inclusion of those as counterproductive or unnecessary. This is the dominant view in the New Consensus. The authors holding this position agree that asset prices should be included if they have the potential to improve inflation forecasting and output growth forecasting, but they find either that asset prices do not help to improve inflation forecasting or that the inclusion of asset prices is not relevant

[1] And, if the central bank cannot distinguish the nature of the increase in asset prices (fundamental or speculation), it should not react to the rise (Cecchetti 2003).

(the loss is not lower) if appropriate weights are put on inflation and output in the reaction function.

Borio, Kennedy, and Prowse (1994), Shiratsuka (1999), Stock and Watson (2000), and Filardo (2000) conclude that aggregate asset-prices indexes, or individual asset prices, are not reliable leading indicators for inflation or output growth. The authors usually can find a predictive capacity, but "the strength and regularity of the relationship are open to question" (Borio et al. 1994):

> Some asset prices predict either inflation or output growth in some countries in some periods. Which series predict what, when and where is, however, hard to predict: good forecasting performance by an indicator in one period seems to be unrelated to whether it is a useful indicator in a later period. (Stock and Watson 2000)

One explanation provided by those studies is that the predictive capacity of asset prices depends on the institutional context (Spaventa 1998) and on the nature of asset-price growth. If one asset represents a big part of the portfolio of households, it has more chance to generate a wealth effect, and the growth of asset prices that reflects productivity growth will not trigger any inflation. Thus, the main conclusion of these studies is that "hard and fast rules are clearly inappropriate; considerable judgment is called for" (Borio et al. 1994).

At the theoretical level, Goodfriend (1998a, 2000, 2003) argues that equity prices are a misleading indicator for inflation forecasting, a role already fulfilled by the spot-rate yield curve (Goodfriend 1998b). More generally, a preemptive monetary policy is, for him, usually in conflict with taking into account asset prices. This is so because in order to prevent inflation, a central bank may have to increase its interest rate, even if asset prices are decreasing and there are no signs of inflation because of credibility or productivity concerns. Another point of Goodfriend's argument (Goodfriend 2000) is that the capacity of the central bank to affect long-term rates rests on the relative inertia of its policy. If a central bank moves its short-term rate too frequently and too widely, it will lose control of the yield curve. As shown above, the proponents of an inclusion of asset prices agree that wider fluctuations in short-term rates will be necessary.

Putting aside the case of financial crisis, Bernanke and Gertler (1999, 2001), Artus (2000), Bullard and Schaling (2000), and Fuhrer and Moore (1992) argue that the improvement of inflation targeting is insignificant, nil, or even negative by adding asset prices into the reaction

function of the central bank. Gilchrist and Leahy (2002) summarize the position by arguing that asset prices should not be included in an inflation index or be used to forecast inflation, and by showing that strong inflation targeting by the central bank leads to an efficient response to a shock. Bernanke and Gertler (1999, 2001) argue that a flexible inflation targeting that is aggressive enough provides both price stability and financial stability. This is so because, first, this policy has a strong focus on the stabilization of aggregate demand and, therefore, it already includes the possibility of a wealth effect. Second, as Schwarz argues, is that the absence of disinflation or deflation promotes financial stability. Third, lower inflation decreases interest rates and asset prices, and so limits the balance-sheet effects of asset prices — lower debt burden, lower sensitivity of balance sheets to asset prices. Fourth, the simple knowledge of economic agents that the central bank will react to asset prices if they affect output-price inflation limits the possibility of overreactions and bubbles. This result is similar to Furher and Moore (1992), who show that the higher the weight on asset prices, the lower the control of inflation by the central bank. Bernanke and Gertler claim that Cecchetti et al. have their result because they made special assumptions — they assumed that the central bank can know if stock markets are driven by fundamentals or not, and they assumed that the central bank knows when the bubble will burst.

1.2.3. Asset Prices and Financial Stability: Beyond Inflation Targeting

The last debate that exists in the New Consensus concerns the role of the central bank with regard to asset prices when an asset-price bubble is present and when the financial system is fragile. The former debate wonders if the central bank should try to prick a bubble and under what conditions it could do so. The second part of the debate argues that it is not asset-price bubble that really matters, but rather the fragility of the financial system.

Bubbles and Central Banking: Bubbles can be very harmful for the economy when they burst because they generate a shift in expectations and a decrease in the value of collateral that increases the asymmetry of information between borrowers and lenders, and also lead to a credit crunch and a recession. This concern led Kent and Lowe (1997) to wonder if, knowing that the bursting of the bubble may have significant effects on the financial system and so the economy,

it may be preferable to burst the bubble early. A central bank can, then, increase its interest rate in order to increase the chance of collapse of the bubble. This may lead to a small contraction or stagnation but "it reduces the probability of the much larger medium-term swings in output and inflation that would eventuate if bubble was allowed to continue unchecked." (Kent and Lowe 1997). Cecchetti et al. (2000) agree with this position, and, as shown earlier, argue that the central bank can get information about asset-price misalignments. Finally, Gruen, Plumb and Stone (2003) and Bordo and Jeanne (2002) show that the bursting of the bubble is desirable under some circumstances but not others. They argue in favor of the central bank intervention to prick when:

> The asset price bubble is small enough […] [that is to say, if] the probability that the bubble will burst of its own accord over the next year is assessed to be small; the bubble's probability of bursting is quite interest sensitive; efficiency losses associated with the bubble rise strongly with the bubble's size; or, the bubble's demise is expected to occur gradually over an extended period, rather than in a sudden burst. (Bordo and Jeanne 2002)

This, of course, implies that the central bank can quickly measure misalignments and can assess the impact of the burst on the economy. If the bubble is too strong and rational, meaning that the expectations of future growth are well anchored in the financial market actors' minds so that many of their economic decisions are based on them, large variations in interest rates will be necessary to burst the bubble and this is not recommended. Indeed, large variations in interest rates are harmful for economic activity, especially when financial imbalances are high.

The majority of the authors in the New Consensus (including central bankers) do not agree with the preceding position. The main argument put forward is that financial markets are efficient, so it is very daring for a central bank to claim that it knows better than the market. It is impossible for a central bank to know when there is a bubble before the market and, if the market knows that there is a bubble, it will correct the misalignment automatically (Mishkin 1988; Goodfriend 1998a, 2000; Issing 1998; Cogley 1999). Bernanke (2002) argues that "safe popping," that is to say, a bursting by the central bank that is not too harmful for the economy, is not feasible by using interest rates; large variations in interest rates are always needed and so harmful consequences will follow for the economy. Borio and Lowe (2002, 2003) and Ferguson (2005) argue that bubbles are too difficult to measure and, because asset prices have an impact on the wealth of economic agents, involve political interests. The latter put strong political

pressures on the central bank, so even if they know that there is a bubble, central bankers will not try to burst it (Mishkin 1988).

Financial Fragility and Asset Prices: The final discussion in the New Consensus concerns the relationship between financial fragility and asset prices. As shown at the end of the preceding discussion, the sensitivity of the economy to asset prices is an important matter. Borio and Lowe (2002, 2003) and Mussa (2003) argue that the level of asset prices does not matter or is an inappropriate target. Indeed, what is really important are the "financial imbalances" of the economy, measured in another way than the bubble. These imbalances can be checked by looking at the growth of credit, the growth of investment and the rapid growth (not level) of asset prices. To these different measures, it is possible to attribute thresholds based on historical values that will define if there is an unsustainable boom in the economy. The role of the central bank should be to respond to both inflation forecasting and financial imbalances:

> Under such a regime the central bank might opt for higher interest rates than are justified simply on the basis of the short-term inflation outlook if there are clear signs of financial imbalances, such as if credit growth is rapid and asset prices are rising quickly. (Borio and Lowe 2003)

Bordo and Jeanne (2002) and Bean (2003) concur that financial imbalances are important for the daily policy of a central bank, even if they do not agree exactly on the way to implement this view — Bean, contrary to Bordo and Jeanne, argues that this is compatible with a flexible inflation targeting framework. The inclusion of financial asset prices should, then, not be done by including them in a rule, but as "additional" concerns for the central bank (Bean 2003).

Many authors agree with the idea that financial fragility matters (Mishkin and White 2002, 2003; Bernanke and Gertler 1990; Gertler 1998; Illing 2001; Schwartz 2003), however, they may not agree with the implications that Borio and Lowe draw from their results. Indeed, some of them argue that the central bank is not able to measure those financial imbalances quickly and accurately. A better solution would be to let the financial imbalances grow and burst, and to concentrate the efforts on the protection of the private sector, especially the financial system, from those bursts (Mishkin and White 2002, 2003). In addition, the central bank, by acting as lender of last resort, will promote an orderly decline.

2. THE POST KEYNESIAN APPROACH

The Monetary Production Economy framework is the one used by Post Keynesians to analyze the capitalist economy. In this framework, nominal value matters, uncertainty is prevalent, and money is central to the working of the economic system. In this context, rationality is not individualist but social and conventions become a central anchor upon which decisions are based. This implies that psychological, social, political, and cultural factors assume a great importance in the dynamics of the economic system. Minsky summarized these dynamics via his financial instability hypothesis — a capitalist economic system is intrinsically unstable and business cycles are the endogenous result of the working of this system. No asymmetries or frictions are necessary. Therefore, public policy should be very active, not only to promote economic stability, but also full employment.

2.1. The Role of Monetary Policy in the Post Keynesian Framework

Given the preceding, the main role of a central bank is not to promote price stability or full employment, roles that should be left to fiscal or income policies:

> Both full employment *and* relatively stable prices are the responsibility of fiscal policy. (Wray 1995)

> Monetary [policy] […] should not be concerned with price level problems *per se*. (Davidson 1968)

A central bank has only a very indirect effect on inflation because it cannot control the supply of reserves and the supply of money and, most importantly, because inflation does not necessarily have monetary origins. In addition, the impact of a central bank on aggregate profit is also very indirect because it goes through investment, where the most important determining variable is not the long-term rate (Keynes 1936; Fazzari et al. 1988):

> It is not quite correct that I attach primary importance to the rate of interest […] I should regard state intervention to encourage investment as probably a more important factor than low rates of interest taken in isolation. (Keynes 1943)

Therefore, the main role of a central bank is to promote financial stability, not low inflation, which can be done in several ways (Minsky 1975a, 1986; Kregel 1984, 1992a; Wray 1990, 1992, 1995, 1996a, 1996b, 1996c, 1997a, 1998a, 1998b).

First, the central bank should be ready to intervene as lender of last resort anytime it is necessary in order to guarantee the liquidity of the positions of economic agents. This is done by buying or discounting eligible papers at a low rate of interest. As Kregel said:

> It [is] not simply the conversion of the bills into money that provided the possibility of liquidation, but the conversion at particular prices relative to other assets. […] The Bank of England thus provided liquidity not so much by purchasing or rediscounting these bills, but by doing so at their prior prices and at market interest rates. (Kregel 1984)

Second, during normal periods, the central bank can promote financial stability by assuring interest-rate stability. The central bank should not change its interest rate targets often because interest rates are not effective tools to affect investment, and because they generate financial instability by affecting the stability of long-term rates and other short-term rates and so the liquidity of balance-sheets positions (Hannsgen 2005), but also cash-flow positions and position-makings sources. Third, the interest rates should be fixed at a level promoting full employment in order to have a smooth coordination between the central bank and the Treasury (Davidson 1968; Minsky 1986; Kregel 1984, 1992a; Wray 1998a). Fourth, selective credit controls (Kaldor 1982; Wray 1991a; Rousseas 1994; Lavoie 1996a) and supervision should be developed in order to promote aggregate and micro financial stability (Wray 1995; Minsky 1975b; Shull 1993; Guttentag and Herring 1988). Fifth, Palley (2000, 2003, 2004) recently proposed to develop an asset-based reserve requirement system. He argues that it would help to manage the financial side of the economy and to manage bubbles by influencing the relative cost of the assets held by

financial institutions.[2] In the end, because the main influence of monetary policy is on the price of existing assets and so on the liquidity of positions (not on economic growth or inflation), monetary policy should be oriented toward promoting financial stability and complementing the full employment policy of the Treasury by fixing low and stable interest rates.

However, not all Post Keynesians agree with this conclusion and some of them want a more active involvement of the central bank in the management of economic growth and/or distribution. Starting with the latter, Smithin, Lavoie, and Seccareccia are for an involvement of the central bank in the setting of real rates to limit the unequal distribution of income between lenders and borrowers. For reasons mainly related to the absence of or minimal fiscal policy[3], Dalziel (2002, 2001), and Fontana and Palacio-Vera (2002, 2005) welcome the importance of the central bank as a main element in the fine-tuning of the economy. All the preceding authors, following Moore (1988), argue that the demand for loans is downward sloped, therefore, if the central bank reduces the cost of its reserves, the loan rates fixed by banks will decrease and so the demand for loans will increase automatically. Thus, by lowering and increasing its interest rate, a central bank can influence the demand for credit and so, economic activity. For reasons developed in the last section, one can doubt the relevance of these positions. The main role of a central bank is to provide financial stability.

2.2. Asset Prices, Financial Fragility and Monetary Policy

Two topics can be found in the literature — the relationship between full employment, price stability, and financial fragility, and the role of monetary policy in the valuation process of asset prices.

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[2] One, however, may be skeptical about the effectiveness of an asset-based reserve requirement system. Previously, similar experiences were unsuccessful, either through reserve requirements on deposits (from the own acknowledgment of FOMC members) (Tymoigne 2006, chapter 6), or via margin requirements (Ferguson 2000; Fortune 2000; Greenspan 2002), in constraining the behaviors of the financial system participants — financial institutions do not wait for reserves to buy securities and may be able to transfer the cost of reserves on their sources of profit (Moore 1988; Moore 1991; Lavoie 1992). Given this possibility of transfer, one may argue that higher reserve requirements may actually trigger higher inflation if financial institution consumers also pass higher financial costs to their sources of cash-flow.

[3] Discussion with Giuseppe Fontana.

2.2.1. Financial Fragility, Full Employment, and Inflation

Post Keynesians have shown that financial stability, price stability, and full employment are highly complementary. By promoting a stable financial structure, the central bank will promote price stability and will make it easier to reach and to maintain full employment. By guaranteeing full employment and price stability, a stable financial structure will be promoted, at least until a certain point. As Minsky remarked, there are no definitive solutions to the management of a capitalist system because each period of stability may lead to instability.

Full Employment and Financial Fragility: Following Keynes' statement that capitalism is flawed because it fails to provide full employment and because it generates unequal and arbitrary distribution of resources, the main policy goals of the government should be, for Post Keynesians, to ensure full employment and to correct for arbitrary inequalities. The government can do so by acting directly through an employer of last resort program and indirectly (by promoting full employment in the private sector) through policies that promote financial stability.

Without a stable financial structure, it is impossible to maintain full employment in a market economy (Minsky 1975a, 1978). Indeed, when the financial structure is fragile, it may have detrimental consequences on the employment and production once there is a problem that leads to instability. A debt-deflation, or even only a strong recession, may develop, leaving both actual balance sheets and expectations about the future badly affected, which is bad for the dynamism of the private sector.

Second, full employment promotes financial stability because it stabilizes the liquidity preference of individuals by decreasing economic uncertainty:

> If the level of government investment is sufficiently high and sufficiently stable to provide full employment, liquidity will be automatically provided to the system *via* stable incomes and stable sales receipts which assure that debts can be liquidated through the sale of assets. […] The best way to reduce liquidity demands is by assuring that they are provided by the steady full employment cash flows of firms and incomes of households. (Kregel 1984)

Indeed, a steady inflow of cash makes it easier for the private sector to plan ahead to fulfill its debt obligations and limits its needs to go into debt (Minsky 1962, 1986). Of course, if the

private sector becomes too confident, its liquidity preference can decrease dangerously and this may lead to financial fragility, so a central bank should always be preemptive to guarantee financial stability. Full employment does not guarantee financial stability. In being preemptive, it should stay flexible in its approach to deal with innovations that emerge in the economic system:

> The only universal rule for Federal Reserve policy is that it cannot be dictated by any universal rule. (Minsky 1977).

Financial Fragility and Inflation: Minsky (1975a) showed that a fragile financial structure is based on expectations of price rises built in to financial positions and necessitates lender of last resort interventions to prevent financial instability. This may promote inflation under specific conditions. First, the private sector may have an incentive to fulfill its expectations by raising prices. Second, by acting as lender of last resort, the central bank makes balance sheets more liquid and, if liquidity preferences are unchanged, this will tend to promote lending activities and spending. If the productive system is in a sluggish state, inflationary pressures will be generated. Indeed, the income approach to the GDP identity is:

$$PQ \equiv W + \Pi \Rightarrow P \equiv wN/Q + \Pi/Q \Rightarrow P \equiv w/\mathrm{AP}_L + \Pi/Q$$

Thus, assuming that aggregate prices are causally determined by the average wage rate (w), the average productivity of labor (AP_L) and the aggregate mark up (Π/Q), we have:

$$\pi = (g_w - g_{\mathrm{AP}_L}) + (g_\Pi - q)$$

with π the inflation rate, g_w the growth rate of the wage rate, g_{AP_L} the growth rate of average productivity of labor, and g_Π the growth rate of aggregate profit (determined by the Kalecki equation of profit). Prices can go up and down as g_Π and g_w go up and down, but their effect will be mitigated by changes in productivity growth and output growth. Only when the last two are fixed or sluggish relative to g_Π and g_w may inflation permanently take place; this is a state of true inflation. One economic condition during which this can occur is full employment, but this is not

the only one. This can admittedly happen even below full employment because of uncontrolled wage-inflation spiral or because of a rise in cost not controlled by residents (like oil price in the 1970s).

Thus, financial strength and anti-inflation policies are complementary. In addition, because financial strength and full employment are compatible, full employment and price stability are also compatible:

> A full-employment economy, where full employment is guaranteed by government employment programs for both youth and adults, in the context of competitive markets and stable money wages, is a possible offset to the inflationary pressures which follow from the way threats of a deep depression are offset. (Minsky 1983)

Finally, price stability may also promote financial strength by making it easier for the private sector to realize its expectations. As the Schwartz Hypothesis claims, price stability is good for financial stability. However, contrary to this hypothesis, Post Keynesians share the idea that the causality runs both ways. In addition, the simple fact that agents can realize their inflation expectations does not guarantee that their financial position is strong. Their expectations may include refinancing needs and so, promote financial fragility.

2.2.2. Asset Prices, Financial Fragility, and Central Banking

The role of monetary policy is, thus, to participate in a policy that promotes stable full employment, which is done by promoting financial stability and so, financial strength:

> The maintenance of a robust financial structure is a precondition for effective anti-inflation and full employment policies without a need to hazard deep depressions. (Minsky 1978)

In terms of asset prices, this has several implications for monetary policy. The first is that the central bank should promote interest-rate stability in both short-term and long-term maturities — large variations in interest rates are disruptive (Kaldor 1982; Keynes 1936). The stability of short-term interest rates is easy to obtain because the central bank controls the discount rate and can closely target the federal funds rate, whether financial system is an asset-based or an overdraft system (Lavoie 2005); bank loans are related to them through a cost function (Kaldor

1982, Moore 1988). Long-term rates could be directly targeted by the central bank but, usually, it prefers to let the financial market participants fix the long-term rates and influence them by credible policies (Keynes 1936). The expectations of the market concerning future short-term rates (Keynes 1936; Kaldor 1982; Moore 1988) *and* future long-term rates (Keynes 1936; Robinson 1953; Kahn 1954) then become important for the determination of the long-term rates of interest. If the central bank changes its interest rates often, it will raise the uncertainty over both long-term rates and short-term rates. This variability is not desirable in an economy for both liquidity and solvency reasons. Concerning liquidity matters, an economy in which the financing process depends on short-term external funds, and in which the two sides of balance sheets have different maturity, is sensitive to changes in interest rates. In terms of insolvency, too high variations in the long-term rates will affect the value of assets and liabilities (Hannsgen 2005).

The second implication is that, during a period of capital-market inflation, the capacity of the central bank to influence the economy *via* interest rates is low and ineffective (Toporowski 1999, 2000). Indeed, high variations in interest rates are necessary to compensate for the expectations of capital gains and high increases in the rate of interest may stop speculation, but they will also stop economic growth. Here, one finds the conclusions reached by the New Consensus about bubbles — the bubble must be interest sensitive and new (so that financial positions do not depend on it) to justify a popping by the central bank.

Concerning the targeting of asset prices, Post Keynesians are against it. This is so because either it is not possible to define an equilibrium, or fundamental, value (Davidson 2002), or because the central bank already provides a cushion by acting as lender of last resort (Minsky 1986). The main role of the central bank is, then, to guide the system by providing an anchor for the valuation of asset prices and by guiding the system toward the most reliable source of refinancing (Minsky 1986; Kregel 1992a). First, the central bank can provide an anchor in the valuation of asset prices by an extended use of the Discount Window available to a wide range of assets:

> Minsky's support of discount policy is an attempt to introduce monetary policy at the beginning rather than at the end, of the process which determines capital asset prices, i.e. at the moment when banks and firms evaluate the future profitability of investment in drawing up lending agreements. […] If the Fed were to return to creating reserves by discounting against bank's commercial lending, it would be 'cofinancing business' and be 'participating in and encouraging hedge financing.' […] Indeed, such a policy would find the Central Bank situating itself at the interface between firms' anticipations of future profits and bank's anticipations of ability to pay interest; the point at which the price of capital assets is determined. […] It is clear that […] [an] increased use of discount policy would involve making a wider range of assets eligible for discount. Indeed, Minsky suggests that asset eligibility be part of policy discretion. (Kregel 1992a)

By providing an anchor *via* the discount rate, the central bank can guide the expectations of the private sector and so, their liquidity preference (Kregel 1984). Second, by having the discretion to select and to change the securities acceptable at the Discount Window, the central bank can influence the method of (re)financing of the private sector.

3. FINANCIAL STABILITY AND CENTRAL BANKING

We have seen that the New Consensus concludes that financial matters, either through asset prices or financial fragility, do not matter as long as they do not help to improve price stability. In the Post Keynesian approach, the role of financial matters is put forward, even though many authors still focus only on real analysis. Minsky was a leading proponent of concentrating on the financial side of the economy, leaving the productive side for other institutions. However, some Post Keynesians are still convinced that interest rates are a good operating tool for a central bank. We have already provided a criticism of the interest-rate rule followed by the New Consensus (Tymoigne 2005, 2006). In this last part, we criticize the use of interest rates from the Post Keynesian point of view and sketch the implications of taking financial stability as main goal for the central bank.

3.1. Using Interest Rates to Manage the Economy

The use of interest rates by the central bank to manage the economy comes in different forms in the Post Keynesian analysis. Some authors, by relying on Kaldor (1982) and Moore (1988), like Dalziel (1999, 2002) or Fontana and Palacio-Vera (2005), have proposed to use interest rates (either real or nominal) as an effective tool of monetary management:

> The central bank might seek to encourage growth (expansionism) by reducing its base interest rate, while at the same time announcing a strict commitment to raising interest rates again if inflationary pressure should emerge […]. (Dalziel 2001)

By decreasing interest rates, a central bank should be able to promote economic activity because lower interest rates means higher demand for loans. On the other side, by increasing its interest rates, a central bank should be able to give some incentives to borrowers to reduce their demand for loans. Other authors, looking at the distributive consequences of interest-rate policy, have proposed to have a policy rule based on the "fair" rate (Pasinetti 1981; Lavoie 1996a, 1997; Lavoie and Seccareccia 1989, 2000) or on a given small, positive, real rate of interest (Smithin 2003, 2004). Recently, Moore proposed to fix policy rates at a stable low level to counteract the speculative forces in financial markets. The following critically examines each position by looking at the relationship between loan demand and interest rates and by reviewing the importance of distributive effects.

3.1.1. Interest Rates and Demand for Loans

The Horizontalist approach, initiated by Kaldor (1982) and Moore (1988), is a dominant theoretical framework in the Post Keynesian school of thought. Its main contribution is to show that the central bank does not have any quantitative control over the supply of reserves and to take into account seriously the fact that loans create deposits, which create a need for reserves (Lavoie 1992). However, the Horizontalist approach also assumes that the demand for loans is downward sloped, meaning that decreasing (increasing) interest rates will *automatically* lead to

an increase (decrease) in the demand for loans. Depending on the elasticity of demand for loans,[4] the absolute effect is more or less high but, even if the elasticity is low, a large decrease in interest rates should be able to promote economic activity.

This automatic downward relationship is, however, problematic from three points of view. First, as Figure 8 shows, the recent Japanese experience runs counter to this idea. Since 1991, nominal and real interest rates have been mainly decreasing below 3%. However, despite very low interest rates, the central bank failed to promote durable economic expansion and the rate of growth of loans has been negative since 1998. Unemployment continuously grew after 1991 from 2.1% to 5.4% in 2003, and the GDP oscillated between positive and negative growth. Today, banks are filled with excess reserves[5] and government bonds, but bank loans are low because there is no demand for loans. The problem is not one of demand elasticity; there are no bank loans because there are no profitable activities to implement.

A second problem with the downward sloping curve is that it does not take into account the implications of the financing and refinancing process:

> Thus when an investment boom takes place in the context of an enlarged need to refinance maturing debt, the demand 'curve' for short-term debt increases (shifts to the right) and becomes steeper (less elastic). (Minsky 1982)

Firms have to face some financial commitments, whatever the level of interest rates, in order to avoid default and its consequences (higher risk category, loss of reputation, and ultimately bankruptcy). Therefore, the slope of the curve, assuming there is a curve in the first place, may be positive depending on the degree of indebtedness of firms. Indeed, higher interest rates mean higher financial commitments and so the need to borrow more money to face commitments.

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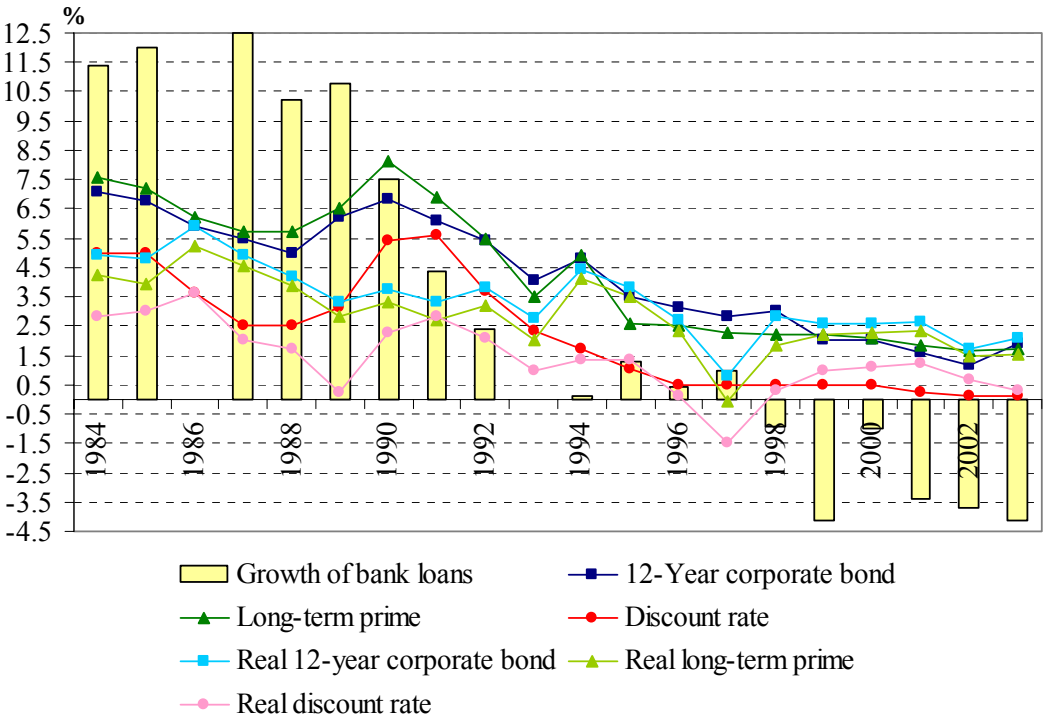
[4] Arestis and Howells (1992) have shown that the emergence of substitutes to bank loans has decreased this elasticity.

[5] In 1994, the average amount of excess reserves was 2.7 billions of yens and this amount grew dramatically in 1998 to reach 699.2 billions of yens. In 2004, the average amount of excess reserves reached 22.8 trillions of yens according to the Bank of Japan.

Figure 1: Real and Nominal Rates of Interest and Growth of Bank Loans in Japan:1984-2003



Source: Bank of Japan.
Notes: Real rates of interest are calculated by subtracting by the CPI inflation. Data for bank loans by domestically licensed banks are not available for 1986 and 1993.

Third, if one is interested in capital-market inflation, Galbraith (1961) and, more recently, Rousseas (1994) or Toporowski (2000), have shown that a central bank may be ineffective in managing this type of inflation because it must compensate for expectations of capital gains. Therefore, unless the central bank increases its interest rates to levels that are harmful for economic activity, this tool is not effective in controlling speculation. Moore recently proposed to set a central bank rate at a low (but positive) interest rate in order to minimize the effect on the real economy and to constrain speculation:

$$i_{cb} = b > 0$$

Two remarks can be made. First, in itself, low interest rates are not a source of financial speculation (Japan, again, is the most recent counter-example) (Galbraith 1961). Second, even if the central bank rate is low, other rates are higher and already provide a break to the emergence of speculation.

3.1.2. Interest Rate, Inflation, and Distribution

Interest-rate changes also have some inflationary and redistributive effects that are usually ignored in the New Neoclassical Synthesis literature, but have been well-developed by economists like Brockway (2001), Graziani (1990, 2003a), Arestis and Howells (1992, 1994), Niggle (1989), Moore (1989), Lavoie (1996a), Sawyer (2002), and Fontana and Palacio-Vera (2002), Smithin (2003), Lavoie and Seccareccia (1989).

Indeed, interest payments are a cost for firms that need to borrow to maintain their activities, therefore, they may just pass their financial cost to their prices, depending on "the magnitude and the expected permanence of interest rate changes" (Moore 1989). In the end, higher interest rates may promote inflation, especially when firms are heavily indebted. Actually, Minsky (1975a) already stated that a fragile financial system tends to be inflationary. The 1979-1980 period provides an example of this phenomenon (Tymoigne 2006).

The other direct effect of monetary policy is distributive effects. The effect of higher interest rates is, then, not so much to decrease bank loans, but to increase the income received by the financial sector at the expense of the indebted sector. This "raise[s] moral questions of equity as well as technical questions about the effectiveness of monetary policy in influencing aggregate demand" (Arestis and Howells 1994). In order to answer these questions, Smithin, Pasinetti, Lavoie and Seccareccia have put forward the need to fix the central-bank rate at a level that is neutral. This neutrality is different depending on these authors. For Smithin, the central bank rate should be fixed at level that is consistent with inflation expectations so that a small positive expected real rate of interest is set (and optimally this expected rate should be zero) (Smithin 2004):

$$i_{cb} \approx E(\pi) \quad \text{with} \quad i_{cb} \geq E(\pi)$$

By following this rule, a central bank would preserve the purchasing power of interest-income earners while limiting the compounding effects of interest rates on debts and so, economic growth. Lavoie and Seccareccia, however, prefer to follow Pasinetti and have an interest-rate rule that is more related to the fair rate. Following Pasinetti (1981), Lavoie (1996a, 1997) states that the central bank rate should be fixed so that:

$$i_{cb} = g_{AP} + E(\pi)$$

with g_{AP} the rate of growth of average multifactor productivity. There are, however, several problems with each of those rules. The most obvious is that interest rates and inflation are not independent variables as stated earlier, so a positive feedback effect may emerge from these types of policy rules. Second, these types of policy have to determine the relevant time frame that should be used for inflation expectations. This may lead central bankers to become paranoid about the possible emergence of inflation and to try to justify an increase in interest rate when there is actually no sign of any potential increase in price in the future. Greenspan's policy of preemptively raising the policy rates is a perfect example of this, and a perfect example of how this promotes low growth and instable financial markets (Papadimitriou and Wray 1994; Wray 1997b; Tymoigne 2006). Third, the preceding rules assume a relatively stable rate of inflation and rate of growth of productivity overtime. If this is not the case, a central bank may have to move its interest rates widely, promoting financial instability in financial markets and the indebted economic sectors.

3.2. Financial Stability as a Goal: Implications

Central banks have been created to deal with the financial side of the economic system and should concentrate on this exclusively. There are already several devices that exist to promote, check, and solve the liquidity of the economy — lender of last resort policy and supervision. However, these devices have been used or framed inadequately because they do not take into account the broad picture of aggregate financial fragility. Thus, by not taking into account systemic risk, the lender of last resort leads to moral hazard, and supervision has been practiced by assuming that failure was due to the bad behavior of financial institutions (Shull 1993;

Guttentag and Herring 1988). Taking into account financial fragility would improve these devices, but other things can be developed. Besides, the central bank can also intervene via other means.

3.2.1. The Role of Guidance of the Central Bank

While concentrating their attention on the financial side of the economic system, central bankers should then understand that the rationality of economic agents is different from the economic rationality that is traditionally assumed — individual rationality is social, not individualistic. This idea is reinforced by the competitive pressure existing in the financial system. As Wojnilower notes about bankers:

> In the 1960s, commercial bank clients frequently inquired how far they could prudently go in breaching traditional standards of liquidity and capitalization that were clearly obsolescent. My advice was always the same—to stick with the majority. Anyone out front risked drawing the lightning of the Federal Reserve or other regulatory retribution. Anyone who lagged behind would lose their market share. But those in the middle had safety in numbers; they could not all be punished, for fear of the repercussion of the economy as a whole. […] And if the problem grew too big for the Federal Reserve and the banking system were swamped, well then the world would be at an end anyhow and even the most cautious of banks would likely be dragged down with the rest. (Wojnilower 1977)

This implies that the role of convention becomes central for economic decisions, which has several implications for the conduct of central banking.

First, a central bank should be a central anchor for *financial* decisions by trying to influence the existing financial convention about the appropriate way to leverage expectations of cash flows (Minsky 1975a). The central bank should be at the center of a financial policy that guides the practices of financial institutions — portfolio strategy and methods of granting loans.

Second, this role of guidance is essential because private economic agents are driven by a profit-motive that prevents them from recognizing, or acknowledging, the potential social disruptions and inefficiencies induced by the combination of *individual* search for accumulation and *social* base of justification. Without this guiding role, a central bank is condemned to be a follower in the game of letting gains be privatized and losses socially sustained *via* economic

disruptions leading to inflation, unemployment, and a prolonged recession. As lender of last resort, the central bank should be the one that writes the rule of this game.

Third, because a convention is arbitrary in nature, even if the justification process that sustains them is well grounded and may lead to economic decisions that realize of the future envisioned by the convention, the level of asset prices is not what matters. There is no *a priori* fundamental value and the notion of a bubble is not a relevant practical concept for a central bank. Indeed, by claiming that financial-market participants are irrational, the central bank will create both social discontent and point at the wrong problem. It will create social discontent and disbelief because it is always possible to justify, *ex post,* any level of asset price. This sense of rationalization and denial is especially strong for those who are heavily involved in the segments of the financial market where the path of growth seems unsustainable for the central bank. The latter will point at the wrong problem and provide wrong guidance because even if prices are believed by everybody, including the central bank and the most conservative financial analysts, to be at their appropriate level, financial disruptions can still occur. This goes *via* the sensitivity of balance-sheet positions, cash-flow positions, and sources of position-making activities, to a change in asset prices. Very small changes in asset prices may lead to large problems if the economic system is financially fragile; asset prices matter for monetary policy, but not through their level.

A central bank is not the "dumb" or "ignorant" guy in the valuation of what lies ahead. On the contrary, a central bank should be viewed as holding a key position because of its capacity to look far into the past, because of its experience in dealing with macroeconomic problems, and because of its role as lender of last resort. The central bank knows something because it knows more than the CEOs or any other financial analysts about what happened in the past and that human nature pushes toward ignoring lessons from the past. What is needed is a productive cooperation between financial institutions and central banks, each providing their own experience for a better financial policy. This cooperation, however, may be difficult because of the profit motive that drives the private financial institutions. As Wojnilower noted recently:

> The Fed wants a smoothly growing economy, but the securities industry thrives on volatility that generates trading volume and profits. The Fed and financial markets are adversaries, not allies. (Wojnilower 2005)

In this case, central bankers should have the nerve to use the vast regulatory and supervisory power given to them. They will only have the strength to do so if they have the right tool to argue their point of view and if they have the will to go against the strong social and political pressures that promote short-term wealth accumulation against long-term financial stability.

3.2.2. How to Do It

The problem, then, becomes to figure out the way central banks can implement a financial policy that promotes financial stability by guiding the financial system toward behaviors that are more socially responsible. Central banks can do this in several ways. One has to recognize that part of this guiding principle already exists. For example, pension funds cannot place their funds in more than a certain proportion in different types of securities and clearer information has been made available to individual agents about the risk of placing in the stock market. However, cases like Enron and the new economy bubble show that this is not enough and individuals are ready to bet their future savings on arbitrary convention without checking for the implications of their choices.

The first thing that a central bank should do is to devote most of its research to the understanding of the aggregate financial frame and the financial interactions that exist between different sectors of the economy. This requires a change of economic paradigm and so, a change in the methodological tools used to analyze economic activity; a monetary economy is fundamentally different from a barter economy with money. What we want are models with more realistic hypotheses and detailed institutional frame, and models that grasp the complexity of economic mechanisms. Stock and flow tables, combined with System Dynamics, provide methodological tools that seem potentially useful in the search for a comprehensive understanding of the interactions and dynamics of an economic system (Tymoigne 2006).

Once this research has been developed, a better understanding of how and where systemic risk could emerge would be available. This could allow the central bank to develop an aggregate stress test to study the sensitivity of balance-sheets, cash-flow positions, and position-making sources, to changes in asset prices, output prices, income, interest rates, foreign exchange rates, criteria of creditworthiness, and other types of crucial factors for the cash inflows and cash outflows of economic units. This would also give the central bank a better understanding of the

refinancing sources that are used, and potentially useable, by the private sectors. In the end, a central bank would have a comprehensive understanding of the risk of illiquidity and insolvency for the economy or a particular sector of the economy.

The next step would then be to use this tool — to establish rules in the game of private gain/social loss. The central bank could do this in several ways. First, moral suasion, if thought appropriate, would be based on a stronger argument than just "there is bubble" or "irrational exuberance." Second, the supervision process should be forward looking and include the importance of aggregate financial fragility. Individual supervision should, then, have the goal of putting forward to individual agents the social consequences of their choices and the potential negative impacts of their own activities on the rest of the world. This type of supervision should replace the "bad bank" approach to supervision, which assumes there is necessarily something wrong with the managers of financial institutions. In a world in which competition is a driving force, conformism, even toward dangerous behaviors, is inherent. Third, the lender of last resort policy of the central bank would be greatly improved because it would be easier to understand the state of financial fragility of an economic system and so to improve the timing of a lender of last resort intervention. The central bank could let asset prices go down more easily if the fragility is not too high. Private agents would then understand that a bailing out would not be immediate and that they could face substantial losses before the central bank intervenes. This should promote more prudent financial behavior by all economic agents. At the same time, once a central bank has decided to lend, it should also help the simplification process by having a broad lender of last resort policy. Fourth, the central bank would also be involved in the resolution of financial problems by guiding the restructuring toward more financially responsible economic behaviors. Finally, a comprehensive model of financial interlinkages would help a central bank in promoting financial reforms that make the financial system more stable. One part of this financial reform would be to orient research toward financial instruments that allow a smooth financing and funding of economic activities without promoting financial fragility. Instruments that have income and capital components that are indexed to the main cash inflows of borrowers would help to achieve that goal. Thus, financial instruments with a maturity adapted to that of main cash-flow generating activities and an income component that may or may not be *due,* depending on the cash inflows of the borrowers, would greatly improve the stability of the system by limiting refinancing needs.

In total, a central bank has to work at both the expectation level and the actual level of the financial side of the economy. At the expectation level, it should take part in the formation and guidance of financial conventions, guiding financial decisions by reminding actors about the past, showing how sensitive positions are to changes or non-realizations of expectations, and by not having a premature lender of last resort policy if it knows that the system can sustain some financial loss. At the actual level, it should check and manage the fragility of the financial frame of the economy, both at the aggregate and individual levels. The central bank can also have an impact on the actual level by promoting smooth financial instrument for borrowers, by guiding the refinancing practices through the acceptance of certain types of assets at the Discount Window, and by making the simplification process smoother once it has decided to intervene as lender of last resort. Finally, in order to promote stability, the central bank should take part in the restructuring process that takes place following a general or local financial instability if the intervention of a central bank is required.

3.2.3. Limits

There are, however, limits on what a central bank can do. Indeed, putting a floor policy will be effective only as long as the crisis occurs in markets in which the central bank is willing to intervene and as long as the crisis is a liquidity crisis. First, if the crisis concerns assets with a low degree of liquidity, like houses and land, the central bank intervention to put a floor will not be effective unless the central bank is ready to buy those assets. This seems improbable. Central bankers are not ready to encumber themselves with assets that they know are hard to sell and that are not useful to them. Even if the central bank does not intervene directly, but through market makers or private banks, the latter will be very reluctant to buy, unless their liquidity preference is really low, which is doubtful during a period of crisis. Second, if the crisis is not a liquidity crisis but a solvency crisis in which expectations of all private market participants (included market makers) are shifted downward, the floor policy of the central bank will work only if the central bank intervenes directly (and not through intermediaries by providing advance at the Window) in the market to buy the assets. However, central banks are usually not fit to deal with a massive solvency crisis (they will not buy non-performing assets).

If central bankers do not feel that they should do this directly, they could create an institution specialized in the smoothing of the simplification process and work closely with this institution. The point is that there is an institution that is able to deal with liquidity crisis (the central bank), but no institution exists to deal with solvency crisis. A complementary institution, like a government investment bank (like the Reconstruction Finance Corporation of the 1930s), would be necessary. Another solution would be for the central bank to extend its responsibilities toward this area — canceling debts in a constructive manner (by also being involved in the restructuring process) is the best way to promote recovery. The Hunt crisis is the perfect example of what a central bank should not do and the hole left by the inexistence of an institution to deal with solvency problems — no participation in the discussion of private bail out, no strict imposition of conditions, or restriction on the future behavior of banks and Hunt (Greider 1987)

4. CONCLUSION

In the end, therefore, we have reached a central bank that has a central role in the management of the economic system, but it is not the role that is attributed to it today. The central bank should be more involved in financial matters, both as a guide (to influence the conventions and so expectations of private agents) and as a reformer (to promote the emergence of institutions that promote financial stability). Central banks should change their current way of operating by changing their goal and their instruments of intervention. Its main objective should not be price stability but financial stability; and its main tool should not be interest rates but an analysis of systemic risk. Policy interest rates should be set at zero for an undetermined period. Interest rates, as an operating tool, are grossly ineffective for managing the economic system and may promote economic fragility, inflation, misdistribution of income, and recession. Financial policy should replace a monetary policy and should be included in a broader goal of permanent stable full employment.

The central bank has a role of contrarian, but this should not be done by fine tuning the economy by using interest — a rather ineffective tool because of its passivity, cumulative effects, and *ex post* response to the problem — but by intervening dynamically in the credit and financial

policies of the financial system. The interest rate is passive because the main factors affecting decisions are expectations as Greenspan himself recognized:

> Prolonged periods of expansion promote a greater *rational* willingness to take risks, a pattern very difficult to avert by a modest tightening of monetary policy. (Greenspan, Speech, August, 30 2002)

The interest rate is an *ex post* tool because once decisions have been implemented and affect the economic system (*via* inflation, employment, speculation, or any other ways), those decisions are irreversible and have to be financed and funded. It is cumulative because higher interest rates lead to more borrowing when agents are already indebted. The central bank would then go from a passive to a dynamic approach to central banking and avoid using interest rate, a poor instrument of management. The dynamic approach would consist in checking, avoiding, and managing liquidity problems, as well as taking part in the resolution process of insolvency cases.

This vision of the role of a central bank is completely opposed to the New Neoclassical Synthesis conclusion for several reasons. First, we do not assume that inflation has only, or even principally, a monetary origin. Second, interest rates are mainly guided by monetary forces and there is no real anchor. Third, we live in a monetary production economy in which agents care only about nominal values and compare only nominal values. Fourth, the world is uncertain and the future is not written but created by current economic decisions. Fifth, there are other public institutions that are better suited for the goal of price stability and to affect the productive side of the economic system.

Finally, financial policy should be included in a broader policy that promotes full employment and price stability. Socialization of investment, employer of last resort policy, and income policy should all complement the financial policy of the central bank by providing productive guidance and distributive guidance. The central bank would be also part of the socialization of investment via its credit control policy. All in all, the central bank would have a more active and effective role in the management of the economy.

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