

## **CENTRAL BANKS AND PRICE STABILITY: IS A SINGLE OBJECTIVE ENOUGH?**

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### **I. Introduction**

It has been common practice, until relatively recent times, that by statute, central banks are required to pursue multiple macroeconomic (and sometime microeconomic) objectives. These included sustainable growth, high employment, efficient allocation and use of resources, security of the payments system, and many other elements that are supposed to guarantee “economic progress”. Central banks were also, to large extent, subordinated to government authority and had a very low level of administrative, target, and instrumental autonomy. In more recent years many countries have moved, steadily, towards granting independence to their central banks. Such movement has been prompted by the recognition that independence is a crucial factor supporting the credibility of the institution, which is a precondition for effectiveness and efficiency of monetary policy.

Together with the spreading of central bank independence, there has been a tendency to limit the number of objectives that the autonomous central bank should pursue. In fact, it has been widely claimed that, in order to boost credibility and to avoid the time inconsistency problem which frequently affects governments policy decisions, it is necessary to set a single objective

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for the central bank,<sup>2</sup> and that the single objective should be *to attain and to maintain price stability*. This is the corollary of the analytical conception that monetary policy is best suited to achieve medium-term control over inflation, while its output, employment, and allocative effects are not regarded as either predictable or sustainable and, therefore, it would not be feasible to make the achievement of growth or the lowering of unemployment a realistic monetary policy objectives. Moreover, it has been broadly accepted that if other macroeconomic objectives, beyond price stability, are placed within the explicit responsibility of the central bank, this would tend to wear away central bank credibility and to weaken its ability to attain its primary objective.

Within this framework, it has become accepted wisdom to curtail, or at least to minimize, the role that central banks should play in other macroeconomic policy areas.<sup>3</sup> However, current developments in monetary theory, coupled with the recent practical experience of many and diverse central banks, suggest that in order to discharge their responsibility, and achieve and preserve successful macroeconomic stabilization, central banks need to deal with a myriad of accompanying circumstances within which policies and institutions develop.

These circumstances, and the rapid evolution of financial markets in recent times, require that central banks focus, in addition to pursuing their primary objective, on some additional targets by addressing, with distinctive emphasis, a number of basic principles of monetary and central banking policies and analyze their significance for the achievement and the maintenance of macroeconomic stabilization.

The purpose of this paper is to review, in light of current experience, the

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<sup>2</sup> Of course, single objectives also facilitate accountability, which is the counterpart demanded from central banks in exchange for autonomy.

<sup>3</sup> In most legal statutes dealing with central bank autonomy there are, of course, qualifiers. But they tend to be vague and undefined and, in most cases, they ensure that in case of conflict, price stability takes precedence. For example, the primary objective of the European Central Bank "shall be to maintain price stability. Without prejudice to the objective of price stability, it shall support the general economic policies of the Community."

challenges for the central bank arising from some of these developments. Section II deals with the question of targeting monetary policy when inflation has been, indeed, conquered. Section III discusses the importance of ensuring a sound financial system and the role that central banks have to fulfill in this regard, relative to the role of the markets. Section IV, discusses the challenges for monetary policy that arise from the explosion of derivative markets. Section V summarizes some conclusions.

## **II. Is there a “Special Monetary Policy for a Low Inflation Environment?”**

In a large number of both industrial and emerging economies inflation is at an historical low and has averaged between 2–3 percent since the beginning of the 1990s. Several factors have played a role in achieving such performance. Some of these factors are related to the slack in world economic activity but the low level of inflation also reflects the generalized understanding on the part of both policy makers and the public at large, of the economic costs and distortions caused by run away inflation. This understanding has led to an unusual effort to attain fiscal consolidation and, to a large extent, to the unswerving commitment of central banks to the implementation of anti-inflation monetary policies, in line with the above mentioned widespread adoption of price stability as the paramount objective of the monetary authorities.

This situation has elicited a number of interesting issues: Is it desirable—and feasible—to continue the efforts to attain further disinflation to reach, preferable, full price stability? And what should be the objectives of monetary policy within the context of very low inflation?

With respect to the first question, it is evident that it is a matter of cost and benefits. While the literature on the relative costs of inflation and disinflation is very rich and well known, it is interesting to dwell on the further specific costs that may arise from a policy of going from very low to zero inflation. There are two arguments that have been advanced to assert that it would be

distinctively costly to move to full price stability. The first category of arguments deal with the obvious impossibility to set negative nominal interest rates. The second, with the prevalence of downward nominal wage rigidity.

The interest rate argument relates to the degrees of freedom that a central bank has when inflation rates are non-zero. The claim is that in these circumstances, the central bank could compensate for negative exogenous demand shocks by moving nominal short-term rates below the rate of inflation in order to stimulate demand. Of course, the margin for these operations (i.e., the ability to bring real rates to zero or negative values) is curtailed when inflation is nil,<sup>4</sup> and therefore the central bank is seriously constrained in its capability to offset negative demand developments.

The wage rigidity proposition claims that in situations of full price stability there is a strong probability that prices—and particularly some individual prices—could move into negative territory. A price decline, in the presence of nominal wage inflexibility would result in higher real wages and they could, therefore, cause higher unemployment. In fact, it has been claimed that the natural rate of unemployment will tend to rise at zero inflation since firms could be hesitant to hire in conditions of uncertainty regarding the behavior of real wages.<sup>5</sup> The relevance of the nominal wage argument fully rests, of course, on the validity of the wage rigidity assumption. In emerging countries, with large informal labor markets, wages are probably quite flexible and, as a whole, it is not unreasonable to assume that even where nominal downward wage rigidity has been prevalent, labor market may become much more flexible as inflation falls to zero, and remains at this level for prolonged periods. Moreover, what is indeed important in terms of employment is the behavior of

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<sup>4</sup> Notice that the need for some active monetary policy may actually increase when negative shocks hit at zero inflation. This is so because if the original fall in demand results in deflationary expectations, real interest rates go up even if nominal rates remain unchanged. This, of course, strengthens the recessionary impact of the negative shock.

<sup>5</sup> See Akerlof, G., W.T. Dickens, and G. L. Perry, “The Macroeconomics of Low Inflation”, *Brookings Papers on Economic Activity*, Volume 1, 1996.

unit labor costs which, of course, are affected by productivity gains. Even with rigid wages and price declines, unit labor costs may fall when the rate of productivity growth is high enough.

The nominal wage argument is, therefore, not very strong. But the constraints arising from the non-negativity of interest rates pose some dilemma for central bank policies. In particular, the question is how much is this constrain actually impairing monetary policy? The answer depends, to a large extent, on the type of transmission mechanisms assumed to be at play. For example, if inflation and interest rates are close to zero, interest rates mechanisms may not be available to affect the decisions of economic agents. However, monetary policy can still be effective through wealth and exchange rate effects. An increase in liquidity may affect asset prices, stimulating demand. Moreover, even without price effects, credit in the economy could become more easily available if the value of collaterals increase. All this may have clear expansionary effects. Similarly, monetary policy could result in expansionary effects by inducing a depreciation of the currency. This, of course, may not be a feasible policy in the longer run (and could result in a number of undesirable outcomes) but illustrate the point that, even without recourse to negative real interest rates, central bank could preserve a degree of operational freedom in the presence of negligible inflation.

An additional matter is related to the informational content of interest rates. It is clear that interest rates have been largely regarded as indicators of market expectations, and central banks tend to observe the behavior of overnight rates as good indicators of policy stance.<sup>6</sup> It is claimed that when interest rates approach zero levels this mechanism largely vanishes, and the informational value of interest rates (and of the term structure) is seriously cut down. While there is a degree of truth in this claim, it is also correct to postulate that, under these conditions, there are other indicators, such as asset prices, that can be

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<sup>6</sup> It has been long believed that the shape and slope of the term structure curve contains valuable information regarding the market's expectations about inflation and income changes.

utilized to gauge expectations and overall monetary conditions.

From the above considerations, it is possible to assert that the operational capabilities of the central bank are not severely handicapped by full price stability and, that even at low levels of inflation, it is worthwhile for central banks to strive towards the achievement of zero price changes.

### **III. Market Mechanisms and Banking Soundness: Disclosure or Central Bank Regulation?**

Although banking crises are by no means a new phenomenon, the recent increase in the incidence of financial instability and their close relationship with overall macroeconomic developments have made the objective of *protecting the soundness of the banking system* a central goal of government policy, and therefore a subject of particular attention in the discussions surrounding the assignment of functions and responsibilities to a central bank concerned with the preservation of macroeconomic stability.

The concept usually utilized to gauge the potential *instability* of a banking system is the degree of its *soundness*. A sound banking system is deemed to be stable because it can withstand well unexpected shocks and radical policy changes. Soundness, in turn, is specified as a situation in which the majority of banks are *solvent* and, unless very extreme adverse events take place, are likely to stay so. Since solvency is defined as a positive difference between assets and liabilities, i.e., a positive net worth, unsoundness, and therefore, instability, arises when there is high likelihood that negative occurrences could affect banks' assets and liabilities in a manner that erodes, or even erases, their net worth, rendering the banks insolvent. In other words, instability arises from the risk of insolvency and, in order to trace the sources of instability, it is necessary to investigate the sources of insolvency.

In general, it is possible to say that the likelihood of a banking system to be solvent, and to remain so, depends largely of banks being *profitable* and adequately *capitalized*. Unprofitable banks would not be able to maintain liquidity, would lose their ability to attract deposits, net flow of funds would

turn negative, and, since they cannot conduct normal business, they would become insolvent. Undercapitalized banks, i.e., banks with low net worth, would be unstable because they would be more susceptible to fail in the presence of even moderate negative shocks (such as unexpected asset price adjustments) or policy changes (including financial sector liberalization).

From the above, one can conclude that, assessing the sources of insolvency and instability, amounts to assessing the factors that affect profitability and that reduce the capital of banking institutions. A very long list could, indeed, be composed if a comprehensive attempt is made to identify all these factors. However, in very general terms, one could state that unsoundness of a financial system depends largely on macroeconomic conditions (that affect, directly or indirectly, bank profitability and impinge on the value of bank's capital),<sup>7</sup> but also depends, to a large extent, on the specific manner in which the financial sector is organized and on the arrangements that systematize and regulates its proper functioning. While the role of macroeconomic factors in promoting and preserving financial stability is well known and has received copious attention,<sup>8</sup> the second aspect, i.e., the institutional arrangements, has received less attention despite the fact that it is of no less importance.

These organizational aspects are the focus of this section, that concentrates, in particular, on the debate about the merits of the two possible available arrangements that have been suggested in order to advance and to ensure the prudent behavior of the banking sector. The first type of arrangement is based in pure market mechanisms trusting that they would guarantee the proper

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<sup>7</sup>As a whole, it is correct to say that banks are "mirror" institutions since the strength of a bank's balance sheet reflects the strengths of bank's clients, which in turn reflects the health of the economy as a whole. It is therefore feasible to postulate methodical connections between variables that affect the strength of the aggregate economy, and in particular macroeconomic variables, and indicators of bank solvency and vulnerability. Thus, the performance of macroeconomic factors could be seen as an indicator that may contribute to the appraisal of the stability of a banking sector and to predict its degree of vulnerability.

<sup>8</sup> See, for example, Lindgren, Carl, Gillian Garcia, and Mathew Saal (1996), *Bank Soundness and Macroeconomic Policy*, International Monetary Fund, Washington, D.C.

conduct of banking business. The alternative approach relies heavily on public regulation and on central bank intervention. The view that emanates clearly from the discussion here is that the two alternatives are not substitutes but rather complements. Moreover, there are reasons for suggesting that, beyond direct central bank intervention, there is the need for the official setting of an appropriate framework for the market mechanism to fulfill its disciplinary potential.

#### **A. Trusting Market Mechanisms**

The school of thought that maintain that no intervention is necessary to assure financial stability, claims that market forces can be expected to exercise discipline on financial intermediaries and would tend to recompense capable financial administration, compensate prudent risk management, and castigate those that do not perform their tasks in a careful and judicious manner. However, for this to be true, market mechanisms should operate efficiently, and this necessitates an appropriate institutional and organizational framework. In this sense, it is clear that there are preconditions for reliance on market forces. These preconditions include the availability of appropriate *information systems*, the existence and enforcement of a suitable *legal framework*, and the development of a mature financial environment that guarantees the evolvement of proper *governance* of private-sector institutions (banks and enterprises).

Information systems are indeed crucial. Economic agents have the potential to enforce market discipline just to the extent that they do have the necessary information to their disposal, and discipline would lead to efficiency only if the information is accurate, relevant, and timely. This is particularly true in the financial area. Therefore, without appropriate information, it cannot be expected that the market mechanisms would be able to enforce proper financial-sector management and induce the development of a sound financial sector. It could be claimed, however, that the market itself, if left undisturbed, is bound to provide the required incentives to force market participants to make available and to divulge to interested parties the pertinent information

needed for adequate risk assessment. Nevertheless, it has been observed, and has been abundantly documented, that the system of incentives that should work to motivate market participants to provide, and to use properly, the necessary data has been curtailed by a number of factors. These factors include competitive pressures, the perception of high costs imposed by unilateral voluntary disclosure, and the pervasiveness of public guarantees.

For these reasons, there is today a wide agreement that there are substantial arguments to support a *mandatory process of enhanced public disclosure* and dissemination of information by financial intermediaries. There is not, however, consensus regarding the actual implementation of such compulsory process. There are questions regarding the type of information required, the standards of reporting, and the mechanism of enforcement. The generalized view is that central banks cannot elude their responsibility in putting in place and in coordinating the implementation of a mechanism of this sort they should, however, leave to the market much of the determination of the adequacy and the periodicity of the information to be provided. The authorities, however, should activate a system that secures accuracy of information. Financial institutions should vouch for the correctness of the data that is made available and, it is conceivable, that banks could be legally accountable for client's damages arising from deceiving information.<sup>9</sup>

It should be realized, however, that mandatory disclosure is not a costless process. In addition to the reporting expenses (and the possibility that too much information could confuse the markets) there are trade-offs between the amount and quality of the information provided and the preservation of acquired competitiveness edges of particular institutions. Moreover, the ultimate usefulness of this mechanism depends on the sophistication of the agents operating in the market<sup>10</sup> and on the paucity of the data provided.

In addition to information, the disciplinary role of the market also depends,

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<sup>9</sup> This type of liability applies in New Zealand to members of the bank's board of directors.

<sup>10</sup> For most small investors the costs of collecting and processing disclosed information would probably exceed the benefit.

largely, on the degree of competition. Elimination of barriers to entry (both for financial intermediaries and for wholesale counterparties such as institutional investors) are a crucial factor in enhancing the disciplinary functions of the market, which are certainly to be numbed by cartelization at either end of the spectrum. Of equal importance are the integrity of internal governance mechanisms. The presence of conglomerates and of far-reaching and intricate connections between financial institution and of upstream and downstream linkages between banks and enterprises result in non-transparent structures that include cross subsidization and other practices that hamper the ability of the market to appraise the quality of portfolios.

For these reasons,<sup>11</sup> and despite the appealing of market-generated discipline, such mechanism could not be enough by itself (even if enhanced by mandatory disclosure requirements) to guarantee the preservation of the financial system soundness. It seems necessary that some type of non-intrusive official intervention should be put in place to complement, rather than to replace, the financial order that should be primarily induced by the market.

## **B. The Roles of Regulation and Direct Intervention**

The two traditional mechanisms of government regulation of financial markets are those directed to diminish the effect of systemic turbulence (safety nets, including lender of last resort facilities and deposit guarantees) and those directed to prevent the excessive risk taking of financial institutions (prudential policies and bank supervision). While the first of these mechanisms, the safety net, could be useful to avoid the spreading of financial disruptions and the eruptions of banking crises, it can also, by protecting institutions and investors from adverse outcomes, provide perverse incentives regarding risk assessment and risk taking. By inducing this type of moral hazard it can, therefore, increase

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<sup>11</sup> In addition, it is well known that economic agents tend, in financial markets, to react in extreme fashions. While they may tend to downplay risks (particularly if herd behavior is indeed a characteristic of these markets), and to over-react when signs of stress emerge in the market. This type of behavior heighten the costs of potential financial crises.

the risk of unsoundness. For this reason, safety nets cannot be put in place without appropriate safeguards. The most important of these potential safeguards is the implementation of prudential regulation and of effective banking supervision.

Safety nets without a competent prudential framework is not just counterproductive but also risky and therefore their roles cannot be decoupled. However, prudential rules should be carefully crafted. Unless aptly conceived they can result in abusive and excessively intrusive regulations that may impair efficiency and impede proper competitive practices. These considerations imply that a safety net is important but it should be limited to a minimum and should be accompanied by a prudential framework that, while strict, should be market friendly and complementary with the disciplinary forces of the market.

How to design a market friendly regulatory framework is indeed an important challenge. The framework should avoid suppressing competitive forces but, at the same time, should dampen the incentive of unsound participants to try their fitness in the market. This is indeed the role of licensing requirement. The central bank could certainly supplement the market by monitoring ownership structures and demanding that they are as transparent as feasible. Another area where there is room for complementarities is in the measurement of risk. Significantly, there is increasing convergence between market participants and regulators regarding the use of internal models for assessing market risk. The widespread adoption, and the acceptance by the regulatory authority, of methodologies such as Value-at-Risk, is a good example of the shift from minutious and strict regulations toward cooperative arrangements that place more emphasis on the adequacy of the internal banking procedures.

#### **IV. Implications of Derivatives Markets for Monetary Policy Decision**

Derivatives developed in the mid-70's as a response to the increased volatility of financial markets due to the breakdown of the Bretton Woods

system and to the high and variable inflation that followed the first oil shock. Higher volatility of interest rates and of exchange rates, coupled with financial deregulation, generated a demand for financial innovation that was met by advances in computers and communications technologies. Derivatives contracts are today an important piece of risk management technology since they provide an effective way to control for different forms of market risk (currency risk, interest rate risk, commodity risk and equity risk) and, to a large extent, also for credit risk. The existence of derivatives markets, however, has implications for the design and implementation of monetary policies and confront central banks with new challenges. With few exceptions,<sup>12</sup> these implications have not been discussed in the literature. The goal of this section is to discuss briefly how derivatives contracts affect financial markets, and how their existence changes the financial environment in a manner that should concern monetary policy makers.

The first point to notice is that the size of derivatives markets is very large, particularly in industrial countries, and they are expanding rapidly in emerging countries. The outstanding notional amounts of exchanged traded contracts is over 50 trillion dollars (more than 10 times the size of all assets in the US banking sector) as recorded by the Bank of International Settlements. Around 80 percent of all derivatives transactions are carried out in the Over the Counter (OTC) markets (i.e., by banks) while the rest is undertaken in organized exchanges. Interest rates and foreign exchange contracts represent more than 90 percent of all derivatives transactions. Foreign exchange derivatives take place predominantly in OTC markets. The maturity breakdown of contracts is also relevant: 56 percent of all contracts are up to one year, 34 percent have matured between one and up to 5 years. Only a remaining 10 percent has a term longer than 5 years. However, the bias towards short-term contracts is higher

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<sup>12</sup> See, for example, Hentschel, Ludger and Clifford W. Smith, Jr., "Derivatives Regulation: Implications for Central Banks," *Journal of Monetary Economics*, Vol. 40, 1997, pp. 305–346; and Bank for International Settlements, *Macroeconomic and Monetary Policy Issues Raised by the Growth of Derivative Markets*, Basle, 1994.

in foreign exchange derivatives, since 80 percent of the total is undertaken for less than one year.

### **A. Derivatives Contracts and Financial Markets**

There is broad consensus that derivatives contracts improve the long-run efficiency of financial markets. This is due to their ability to control for risk and adjust it to individual risk-preferences, their role in completing markets and reducing transactions costs, their provision of forward-looking information to market participants, including central banks, and their role in improving asset substitutability. Derivatives allow for the separation of different types of risks, their independent pricing, and the transfer of risks to those agents that are more capable of bearing them. Some agents may be more capable of bearing risk than others because of their preferences, availability of technology, easiness to hedge, and size of their capital.

Derivatives also enhance liquidity by expanding the possibilities for trading, hedging and investing in financial markets. They do not offer anything new (i.e.: any pay-off that can be achieved by a derivative can also be achieved by replicating a portfolio in the cash markets). But derivative markets contribute to the reduction of transaction costs, e.g., in the case of payoffs that are nonlinear functions of an underlying asset, options provide a lower cost of achieving the same pay-off, i.e.: they are responsible for market completion.

Derivatives also make a contribution to reduce information costs. Prices in forward-type markets summarize market views on the expected values of interest rates, exchange rates, equities and commodities at various time horizons; implied volatility in options prices (the volatility “smile”) can be used to gauge the dispersion of market participants expectations and to predict possible size of future prices movements associated with a particular confidence interval. Call/put volume ratios are also used to extract information, since there is some evidence that when the turnover ratio of call/put options rises, prices of underlying assets normally start to rise too. The fact that derivative markets deliver improved and cheaper information can affect

monetary policy makers in two ways: on the one hand it can be effectively used by central banks to gauge market sentiment but, on the other hand, it makes it more difficult for a central bank to implement policy measures that work better by surprising the public.

Derivatives also increase asset substitutability in domestic and international markets: traditional derivatives allow to hedge against changes in exchange rates and interest rates while credit derivatives allow to hedge against changes in the creditworthiness of the counterparty (including default). Once those risks are stripped out, assets with the same financial characteristics (maturity, coupon, frequency of payment of principal) will have a higher degree of substitutability. Of course, substitutability can never be perfect since hedging is costly. But at least, it is possible to unbundle the different sources of risk (foreign exchange, interest rate, default) and to transfer them to another party.

## **B. Derivatives Contracts and Monetary Policies**

The impact of derivative markets on the conduct of monetary policies could be analyzed by assessing the importance of these markets during normal periods and on periods of macroeconomic stress. In normal times, monetary policy is generally conducted by affecting short-term interest rates; these variations get transmitted along the complete government term structure and to other asset prices. The new level of interest rates across the spectrum will then have an impact on lenders and borrowers decisions regarding consumption, saving, and investment. The speed by which changes in short-term interest rates are transmitted to other assets is usually very fast. But the higher asset substitutability and lower transaction costs implied by the existence of derivatives markets are expected to *increase even more the speed of monetary transmission* while, as discussed above, reduce or eliminate any surprise effect of interest rates changes.

While the speed of the transmission increases, there are reasons to assert that the effectiveness of the interest rate channel could be hampered by

derivatives, beyond the negation of the surprise effect. This is so because derivatives provide cost effective ways of hedging variations of short-term interest rates and exchange rates and this may allow planning horizons to be extended with a larger proportion of plans to be temporarily protected from short-term variation in interest rates and from exchange rate changes. Clearly, not all agents can globally escape the consequences of those changes; anyone seeking to shed risk must find a counterparty willing to bear it. That is to say, risk can be redistributed but cannot disappear. But it is probably true that contracts are signed among heterogeneous agents, i.e., agents with different degrees of risk aversion, different liquidity constraints and different propensities to spend. If that is the case, the economy response to variations in short-term interest rates and to changes in exchange rates will be different depending on the presence and size of derivatives markets that allow to redistribute risk according to individual preferences.

The above considerations relate to the impact of derivatives in normal circumstances. During periods of macroeconomic stress, however, derivatives may exacerbate instability by magnifying short-run price volatility in financial markets. A classic example is the possibility of dynamic hedging during a currency crisis, for example, derivatives markets become very illiquid and it is likely that intermediaries will hedge forwards and options in the underlying cash markets. The implication is that this type of hedging activity will have an immediate impact on cash markets that is certain to put additional stress on the price of the weak currency. This pressure is higher for forward contracts than for options at the beginning of the life of the contract, but will tend to be similar as it becomes obvious that the options will end in-the-money. Dynamic hedging also implies that traders have to buy the underlying asset when prices are high and sell when prices are low. This behavior can make particularly difficult to defend a fixed exchange rate with high interest rates since the underlying asset is the weak currency.

Margin and collaterals volatility also increases because, in particular for exchange-traded derivatives, increase in time of high volatility and this may

give rise to liquidity problems for some market participants, that could end up causing large losses with systemic consequences.

While most of the effects discussed above seem to impair the operational ability of the central bank to conduct effectively monetary policies, there is some casual evidence that the existence of derivative markets may also have effects working in the opposite direction by reducing the volatility of the money demand (although it makes it more difficult to define the relevant monetary aggregate). This is so because derivatives transform non-money financial assets, which bear market and credit risk, into closer substitutes for traditional (risk-free) money. For example, a long position in a stock plus a short forward replicates the pay-off of a term deposit (a component of M2). If households and firms maintain precautionary money balances to deal with unexpected events, access to derivatives markets would tend to reduce the volatility of these precautionary balances and the overall volatility of money demand should decline as well. Reducing the volatility of velocity could, make projections more accurate and in addition would also increase central bank control over the money supply.<sup>13</sup>

### **C. The Use of Derivatives by Central Banks**

Derivatives enable a central bank to extend support of the domestic currency beyond the current level of gross reserves. Because interventions in derivatives markets have no material impact on the central bank's balance sheet, this prevents potential problems of sterilization associated with more traditional forms of intervention. But since the levels of reserves pose no constraint on derivative markets (unless counterparties do), the potential losses for the central bank can be heavier than they would otherwise be.

Central bank intervention may have some additional problems: if viewed as a signaling device, the use of derivatives may be perceived as a way of

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<sup>13</sup> Notice that this effect can also work to reduce the overall level of the money demand, requiring an equivalent reduction in the outstanding stock to preserve equilibrium.

postponing difficult decisions. In addition, central bank intervention through derivatives may lead to a reduction in the ability of derivatives contracts to reflect market sentiment and provide accurate information.

It has to be recognized that, in certain circumstances, central bank engagement in forward exchange rate operations (as well as in other derivatives' operations) could probably fulfill a positive function in completing markets and reducing perceptions of risk. But as the central bank enters in a forward contract, it gets exposed to losses should the domestic interest rate rises. Moreover, the risk of high losses increases with the volatility of the foreign interest rate and of the sovereign risk (if interest parity holds in some manner). Thus, forward transactions should only be undertaken, if at all, in conditions of stable international environment and if they can indeed convince speculators about the central bank commitment to defend the exchange rate (or the price of the underlying asset that is being defended). But if agents still bet against the fixed exchange rate and certainty is not restored, this would lead to higher and more variable domestic interest rates. In such cases the forward transaction impacts on the solvency of the central bank and raises the probability of currency crisis.

## V. Concluding Remarks

It has been widely accepted that central banks should be independent and focussed on achieving price stability. However, their functions could not be effectively discharged if attention is not permanently directed to the evolution and development of the surrounding environment. Even if inflation has been defeated, it is incumbent to central banks to strive for price stability. There is even merit in pursuing a *price level*-rather than inflationary-objective. Of course, in this case policy would have to offset past deviations of prices from the established path but this tends to reduce uncertainty about prices over the long run.<sup>14</sup>

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<sup>14</sup> The price level path does not have to be a constant price level. The equivalent of a low inflation target is a path implying a mild price level increases over time.

To achieve its price stability objective the central bank must ensure a sound financial system, a necessary condition for an efficient monetary transmission mechanism. The objective of safeguarding the soundness of the financial system is mutually consistent with the goal of price stability but the central bank should contain its role to those aspects that the market cannot effectively address. Avoiding systemic risks without giving rise to moral hazard is probably the most difficult balancing act that confronts the monetary authority.

The pursue of stabilizing monetary policy has been rendered more complicated by financial engineering. The growth of derivative markets and its implications for macroeconomic policies in general--and for monetary policies in particular--is still in uncharted territory. At the minimum, it has become more difficult to predict with full certainty the consequences of specific monetary policy actions. In the extreme, monetary policy strategies could be totally altered by the rapid market developments. The extreme, however, may not be an unlikely scenario.

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