

*Global Economic Studies Series*

# CENTRAL BANKING AND GLOBALIZATION

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EDITORS



NOVA

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## PREFACE

A central bank, reserve bank, or monetary authority is the entity responsible for the monetary policy of a country or of a group of member states. It is a bank that can lend money to other banks in times of need. Throughout the world, the everyday life of individuals is increasingly influenced by phenomena of social and economic change such as globalization, computerization, or the pluralization of life-courses. Globalization is often used to refer to economic globalization: the integration of national economies into the international economy through trade, foreign direct investment, capital flows, migration, and the spread of technology. This new book takes a look at the central banking industry and globalization, highlighting topics such as the central bank's use of foreign exchange reserves to recapitalize banks, a new metrics measurement that is based on the concept of economic value, and that is embedded in the rational choice theory, the roles of central banking in the period of deflationary depression both empirically and theoretically, and an explanation of the argument that the effect on aggregate demand and output of a fiscal stimulus financed by public debt is markedly different from the effect of a stimulus financed by the Central Bank. This book also examines laws known as trade remedies that mitigate the adverse impact of various trade practices on domestic industries and workers.

As discussed in Chapter 1, the inflation-targeting literature makes the strong assumption that the central bank can exactly target the interest rate that affects investment and consumption decisions, and hence the money supply plays no role in the monetary policy strategy. This assumption is equivalent to admitting the perfect credibility of inflation target announced by the central bank, the perfect functioning of money and financial markets and that the central bank is willing to inject as much liquidity as the economic agents demand. None of these assumptions corresponds to reality. In effect, the inflation expectations can not be easily anchored by the cheap talk of central bankers. On the other hand, the central bank may have many difficulties to target, in a context of financial instability, the interest rates which affect the real and financial decisions of private agents. The authors suggest that under an inflation-targeting regime, money and credit markets carry the inflation expectations that can be anchored with a well-specified feedback money-growth rule. The latter, in contrast to the Friedman's  $k$ -percent money growth rule, can help manage the inflation expectations in a manner to guarantee the dynamic stability of the economy. Furthermore, the model can be easily used to discuss the implications of the zero interest rate policy and the quantitative easing policy.

The United States and many of its trading partners use laws known as trade remedies to mitigate the adverse impact of various trade practices on domestic industries and workers.

U.S. antidumping (AD) laws (19 U.S.C. § 1673 *et seq.*) authorize the imposition of duties if (1) the International Trade Administration (ITA) of the Department of Commerce determines that foreign merchandise is being, or likely to be sold in the United States at less than fair value, and (2) the U.S. International Trade Commission (ITC) determines that an industry in the United States is materially injured or threatened with material injury, or that the establishment of an industry is materially retarded, due to imports of that merchandise. A similar statute (19 U.S.C. § 1671 *et seq.*) authorizes the imposition of countervailing duties (CVD) if the ITA finds that the government of a country or any public entity has provided a subsidy on the manufacture, production, or export of the merchandise, and the ITC determines injury. U.S. safeguard laws (19 U.S.C. § 2251 *et seq.*) authorize the President to provide import relief from injurious surges of imports resulting from fairly competitive trade from all countries. Other safeguard laws authorize relief for import surges from communist countries (19 U.S.C. § 2436) and from China (19 U.S.C. § 2451). In each case, the ITC conducts an investigation, forwards recommendations to the President, and the President may act on the recommendation, modify it, or do nothing.

In the 110<sup>th</sup> Congress, several bills seek to amend trade remedy laws. First, H.R. 708 (English, introduced January 29, 2007) and S. 364 (Rockefeller, introduced January 29, 2007) seek, in slightly different ways, to strengthen U.S. antidumping, countervailing, and safeguard statutes. Second, H.R. 1127 (Knollenberg, introduced February 16, 2007) seeks to give manufacturers that use of goods subject to AD or CVD proceedings standing as interested parties in those proceedings. Third, several bills, including H.R. 782 (Ryan/Hunter, introduced January 31, 2007), its companion bill S. 796 (Bunning, Stabenow, introduced March 7, 2007), S. 974 (Collins, introduced March 22, 2007), and H.R. 1229 (Davis/English, introduced February 28, 2007), seek to amend the trade remedy laws, in part, to address issues regarding the applicability of these laws to China or other nonmarket economy countries. Fourth, S. 122 (Baucus, introduced January 4, 2007) seeks to expand Trade Adjustment Assistance to apply to workers adversely affected by trade that results in the imposition of AD, CVD, or safeguard measures.

Chapter 2 explains, first, U.S. antidumping and countervailing duty statutes and investigations. Second, it describes safeguard statutes and investigative procedures. Third, it briefly presents trade-remedy related legislation in the 109<sup>th</sup> Congress. The appendix provides a chart outlining U.S. trade remedy statutes, major actors, and the effects of these laws. This report will be updated as events warrant.

The purpose of Chapter 3 is to provide a measurement metrics for competitiveness. The concept of competitiveness is elusive and the conventional measurement metrics currently used are not suitable for small island destinations. The study suggests a new metrics measurement that is based on the concept of economic value, and that is embedded in the rational choice theory. It compares the conventional metrics with the proposed measurement metrics, and aims at providing these more suitable metrics for small island destinations with characteristics such as market and natural vulnerabilities. The study uses ordinary least squares to estimate the coefficients of both the conventional and measurement metrics for comparison purposes. The measurement is applied to several island destinations in the Caribbean, a region highly dependent on tourism development and keenly affected by globalization. The results of the study indicate that the new metrics measurement is more

robust and profound in the information and implications that are necessary for policymakers and business managers to measure competitiveness. It suggests a new incentive structure for practitioners in the region that communicates that more is not necessarily better; especially in the context of facing the challenges of improving tourism performance and adjusting to new and often adverse, circumstances.

In Chapter 4, the authors investigate the roles of central banking in the period of deflationary depression both empirically and theoretically, especially in reference to the Japanese economy in the 1990s and the 2000s. In the first part of the paper, the authors summarize the empirical facts on the inferior macroeconomic performance of the Japanese economy and problematical monetary policy of BOJ (Bank of Japan) in the period of the so-called 'lost decade'(the 1990s) and the continued deflationary depression period( the 2000s). In the latter part of the paper, the authors consider some theoretical models which are useful for the interpretation of the above mentioned phenomena.

Political independence of the central bank is considered to bring financial stability to a nation and therefore to foster economic growth by providing safe investment environments. However, granting a central bank autonomy is politically contentious because of the implications such independence will entail for politicians in terms of their ability to influence monetary policy. Chapter 5 analyzes central bank independence in words and in deeds. The first part discusses the existing literature on central bank independence and problems associated with its measurement. The implications of this debate are analyzed with two Latin American countries, Brazil and Chile. In Brazil, the difficulty in reaching a political consensus on granting the central bank formal independence has led the government to confer "operational" independence since the mid-1990s. Despite the improvement in the financial stability of the country, the Brazilian central bank remains politically vulnerable because its independence is not guaranteed by the constitution, and the credibility of prudent monetary policy is not strong enough to deter speculative attacks in critical moments. The Brazilian experience is then contrasted with the Chilean case in which the central bank's independence is constitutionally guaranteed.

A fundamental contradiction emerged in human history during the last few centuries. On the one hand, technological tools and the total production of the world economy rose to a hitherto unimaginably high level. On the other hand, human activities deteriorated the life support services of our planet at an unprecedented rate; if continued unchanged we would soon reach the limits of sustainability. Coping with the risks generated by this contradiction requires a shift in environmental and water management policies. Departments of water resources administration are facing a fundamental dilemma when fulfilling their role within the local, national and regional governance. These departments are held responsible for the protection and the rational utilization of water resources, but the crucial activities affecting the quality and availability of these resources are planned and decided upon by departments of agriculture, industry, transportation and many others. Chapter 6 analyses conceptual approaches towards overcoming these difficulties and presents results and experiences of a master plan and policy analysis elaborated recently for water resources management and administration in Hungary. These elaborations are based on the concept of "socially significant (valued) properties" of the water availabilities within a given region. The coordination of all the water related activities by the respective governments is facilitated by a comprehensive informational infrastructure formulated and presented according to the specific viewpoints of the major departmental branches and institutions.

In 2003, the central bank of China used part of its huge stock of foreign exchange reserves to recapitalize two of its largest banks. Chapter 7 considers when a central bank can successfully execute such a policy without compromising a currency peg.

Globalization fosters a cosmopolitan identity. In such case, the multidimensional identity comes from a plurality of countries and cultures, and the relationship between identity and place vanishes. Obviously intangible forms of heritage, as folklore or traditions, are involved, because costumes fixed in time become the predominant part of identities. At the same time, existential authenticity is predominant in developing countries, as developed ones follow a homogenization process due to globalization. As a result, there is an increasing experience intangible heritage tourism from developed countries to developing ones. Accordingly, developed countries press developing ones to protect intangible heritage as they do with wild nature. Chapter 8 also studies the trade off between protecting intangible heritage and modernity within a place. Finally, it makes a prospecting approach about this phenomenon in the future, taking in consideration an agoraphobic tendency to defensive identities in developed countries, an increasing dual cosmopolitan identity and a tension between intangible heritage and development in developing countries.

Chapter 9 has two main sections. Section 2 summarizes the conventional view that the effect on aggregate demand and output of a fiscal stimulus financed by public debt is markedly different from the effect of a stimulus financed by the Central Bank. In section 3 the authors present our argument about the equivalence between the two types of fiscal expansion financing. Section 4 concludes.

As discussed in Chapter 10, inflation has surged in many parts of the world in the last few months, On account of high food and fuel prices. The exogenous shock has, once again, drawn attention to the appropriate monetary policy to weather external shocks and manage domestic liquidity.

Many industrial countries, under a flexible exchange rate system have aligned monetary policy to stem inflationary pressures. Some would argue that tight monetary policy may have pulled the trigger on the latest episode of credit tightening, forcing global financial meltdown and posing the risk of global recession.

Chapter 11 analyses the implications, in terms of determinacy and E-stability of equilibrium, of a policy rule that responds to private sector expectations in forward looking models. In the literature, this type of policy has been both recommended and criticized. The authors try to understand the reasons for such different conclusions and shed some light on the desirability of this type of policy rules.

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*Chapter 1*

## ON THE ROLE OF MONEY-GROWTH TARGETING UNDER AN INFLATION-TARGETING REGIME

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### **Abstract**

The inflation-targeting literature makes the strong assumption that the central bank can exactly target the interest rate that affects investment and consumption decisions, and hence the money supply plays no role in the monetary policy strategy. This assumption is equivalent to admitting the perfect credibility of inflation target announced by the central bank, the perfect functioning of money and financial markets and that the central bank is willing to inject as much liquidity as the economic agents demand. None of these assumptions corresponds to reality. In effect, the inflation expectations can not be easily anchored by the cheap talk of central bankers. On the other hand, the central bank may have many difficulties to target, in a context of financial instability, the interest rates which affect the real and financial decisions of private agents. We suggest that under an inflation-targeting regime, money and credit markets carry the inflation expectations that can be anchored with a well-specified feedback money-growth rule. The latter, in contrast to the Friedman's  $k$ -percent money growth rule, can help manage the inflation expectations in a manner to guarantee the dynamic stability of the economy. Furthermore, the model can be easily used to discuss the implications of the zero interest rate policy and the quantitative easing policy.

**Keywords:** Interest rate rule, imperfect money and credit markets, inflation targeting, monetary targeting, inflation expectations, Friedman's  $k$ -percent money growth rule, feedback money growth rule, macroeconomic stability, zero-interest-rate policy, quantitative-easing policy.

**JEL Classification:** E43, E44, E51, E52, E58.

## 1. Introduction

Over the last eighteen years, inflation targeting has increasingly become a popular monetary-policy regime among the central banks in the world, since its initial adoption by the central bank of New Zealand in 1990. It has gained more and more popularity among academic economists and central bankers in a context of rapid financial liberalization and innovations, which causes the reported unstable relationship in the short run between monetary aggregates and inflation and hence the failure of monetary targeting. That leads Mishkin (1999) to present the inflation targeting, which can be implemented via an (optimal) interest-rate rule, as being more effective in the control of inflation than the monetary targeting and thus the natural successor of the latter.

The emergence of inflation targeting in practice and in theory is clearly related to research on the interest-rate rules since the 1990s to reflect best the fact that the central bank of the United States conducts the monetary policy by choosing the federal funds rate (Goodfriend, 1991), a very short-term nominal interest rate, and that central banks of other industrialized countries have a similar behavior, including Bundesbank. The latter was considered for a long time as the classical example of a central bank which targets the monetary aggregates.

This research was stimulated in particular by the discovery of Taylor (1993) which shows that simple interest-rate rules seem to coincide quantitatively with the behavior of the Federal Reserve over various periods. Conceptual questions, concerning the determination of macroeconomic variables for a given interest-rate rule, were tackled within various theoretical frameworks (Clarida, Gali and Gertler, 1999; King, 2000).

All that research shares the same consensus, namely that the money and hence the credit do not have any crucial and constructive role to play in the monetary policy. In other words, the money market is only useful for determining the supply of money which responds endogenously to the demand of money, and hence can be largely ignored in making monetary policy decisions (Woodford, 1998; Rudebusch and Svensson, 1999).

This consensus forged for ten years has substituted to the one forged by Milton Friedman, according to which inflation is “always and everywhere a monetary phenomenon”. However, the new consensus is confronted by timid but incessant empirical and theoretical contests as well as the new challenges revealed by the present financial and economic crises.

The experience of the 1970s showed that the inflation expectations of the public can lose their anchor in a context of high oil prices and depreciating U.S. dollars. Monetary targeting such as Milton Friedman’s  $k$ -percent money growth rule was progressively abandoned by central banks in favor of implicit interest rate rules like that discovered by Taylor (1993).<sup>\*</sup> To stabilize the inflation expectations, monetary authorities proactively increase (reduce) the nominal interest rate when the evidence suggests that inflation will rise above (respectively fall below) some numerical objective.

By recommending the adoption of an interest rate rule by the central bank, economists advocate that the supply of money is automatically determined by the demand. In other words, the monetary authority implicitly confer to the private sector the following message: any quantity of money that you wish at given nominal interest rate will be provided. Under

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<sup>\*</sup> In an interview, Milton Friedman admits that the use of the quantity of money as target was not a success (London, 2003).

these conditions, a badly specified interest rate rule could lead to the existence of multiple equilibriums or Wicksellian-type dynamic instability. An important lesson of this literature is that, to avoid the existence of multiple equilibriums as well as Wicksellian-type dynamic instability, it is necessary that the interest rate rule reacts in a sufficiently strong manner to the current or expected rate of inflation.

Recently, by considering some of the leading arguments for assigning an important role to tracking the growth of monetary aggregates when making decisions about monetary policy, Woodford (2008) concludes that none of them provides an indisputable reason to assign a big role to monetary aggregates in the conduct of monetary policy. For him, ignoring money does not mean returning to a conceptual framework that allows the high inflation of the 1970s.

Woodford also rejects the view according to which the models of inflation determination with no role for money are incomplete, or inconsistent with elementary economic principles. However, he stresses the importance of avoiding the traps which are the bad estimate of output gap and the ignorance of the endogenous nature of inflation expectations. Consequently, it is necessary for the central bank to use all the sources of information to judge if the interest rate policy is consistent with the expected future trend of the economy (Svensson and Woodford, 2005).

Within the framework of the IS-LM model (neo-classical synthesis or New Keynesian), there exist two conventional strategies to use equation LM as a not so indispensable accessory in the literature relating to the interest rate rules (King, 2000). The first uses LM to specify money supply rules and to compare them with interest rate rules. The second describes the monetary policy strategy using the interest rate rule and LM is used to determine the endogenous money supply. Within a static framework where the central bank adopts an interest rate rule, LM does not interact with other equations and has thus no importance in the absence of real balance effect. Moreover, the last effect is more hypothetical than real.

However, as argued by Romer (2000), one area in which both the IS-LM and IS-MP (where MP stands for monetary policy, i.e., interest rate rule) may have simplified too far is in their treatment of financial markets. In both approaches, the only feature of financial markets that matters for the demand for goods is 'the' real interest rate that monetary policy can powerfully and directly influence as the central bank desires.

In practice, the demand for goods depends on interest rates that the central bank may not be able to control directly and tenuously as well as the level of credit that is available at those rates. An analysis, which takes more careful account of the impacts of various developments in financial markets on the demand for goods as well as the mechanism through which the monetary policy affects these interest rates and the level of credit, would highlight many of the difficulties and uncertainties of actual policy-making.

Recent experiences of monetary policy in the context of unprecedented financial and economic crises have shown that monetary policy defined in terms of interest rate rule may lose its effectiveness in stabilizing the financial markets and the economy. The zero-interest-rate policy coupled with the quantitative easing policy previously practiced by the central bank of Japan and now by the Fed implies that monetary aggregates have an important role to play.

The question is why the central bank, paying special attention to monetary aggregates during financial crisis, must neglect them when the economy is booming. In this respect, the European central bank (ECB), with its two-pillar monetary policy strategy, may be better inspired.

In this chapter, by adopting a more complicated view of financial markets, we will supply some new arguments in favor of the use of monetary aggregates under an inflation targeting regime and show how to do it. The approach that we adopt in this chapter is narrowly related to some previous works (Dai, 2007; Dai and Sidiropoulos, 2009) which also consider the use of money growth rules under the inflation-targeting regime and where the money market is considered as a link between different economic agents and a coordination device for their inflation expectations.

One important point of the present chapter is that the target of interest rate does not automatically become the interest rate practiced by lenders on the credit market. The transmission mechanism from the repo interest rate, to money market interest rate and then to the lending interest rate can break down due to macroeconomic and financial instability. When the monetary and financial markets are imperfect, the central bank can lose its control over the inflation expectations due to the fact that it controls with imperfect precision the liquidity that private banking and financial sectors can also expand or reduce depending on expectations about future inflation and output.

In the next section, we discuss why the role of money is important in the monetary policy strategy and why the inflation-targeting literature cannot neglect the money and discard the monetary targeting without adopting some very strong assumptions about the functioning of money and financial markets. In the section after, we examine some lessons from the monetary targeting experiences and argue that inflation targeting can be submitted to similar problems. In section 4, we incorporate money and credit markets in a simple New Keynesian model and specify a monetary policy strategy which consists of adding a feedback money growth rule to the inflation targeting regime. In section 5, we discuss why the feedback money growth rule can be useful, in comparison with Friedman's  $k$ -percent rule, in dynamically stabilizing the inflation expectations, under a backward-looking or forward-looking solution. In section 6, we discuss how the framework can be easily used to discuss the zero-interest-rate and quantitative easing policies. We conclude in the last section.

## **2. Why the Money May Be Useful and Important**

Even though the proponents of inflation targeting do not deny the long-run relationship (correlation) between monetary aggregates and inflation, they tend to neglect or deny the causality relationship which runs from monetary aggregates to inflation and hence the role of money as efficient instrument of controlling inflation. Under an inflation targeting regime, the causality of the relationship can be inverted since the supply of money is endogenous and automatically adapts to the evolutions of output and inflation. The inversion of causality cannot be achieved without making some implicit and explicit strong assumptions.

Notably, in the inflation-targeting literature, it is assumed that an independent and transparent central bank without inflation bias can credibly anchor the inflation expectations of private sector by fixing nominal interest rate. This assumption is equivalent to assume that the money market and financial markets are perfectly functioning and hence can be put into a black box without loss of information. From many points of view, these assumptions are very questionable.

Although a typical interest rate rule (Taylor rule or optimal interest rate rule) can be effective in anchoring the inflation expectations in certain models, the result is not robust with

the modifications, weak but empirically plausible, of model specifications. In effect, there is considerable uncertainty about the correct model specifications (Benhabib, Schmitt-Grohe and Uribe, 2001, 2002a, b; Christiano and Rostagno, 2001; Carlstrom and Fuerst, 2002, 2005).

Sharing this concern, Christiano, Motto and Rostagno (2007) describe two examples which illustrate in different manners how the money and the credit can be useful in the conduct of monetary policy. Their first example presents a channel for monetary policy on the supply side and creates the possibility that the inflation expectations lose their anchoring. Illustrated with the help of an IS-LM model augmented of a supply curve, this example shows how the monitoring of money and credit can help anchor the inflation expectations of private agents. Their second example, which recapitulates the analysis of Christiano, Ilut, Motto and Rostagno (2007), shows that a monetary policy which narrowly concentrates on inflation can, in an unintended way, contribute to reduce the welfare via cycles of expansion and depression in the real and financial variables.

Being aware of the importance of money and credit markets, Benjamin Friedman (2003) also worries about abandoning the role of money and the analytical tool which is curve LM. He argues that such an abandonment makes more difficult to take into account how the functioning of banking system (and with it credit markets more generally) can affect the monetary policy and also leaves open the fundamental question in the way in which the central bank manages to fix the interest rate in the first place. Similarly, for Goodhart (2007), the central banks must still give attention to the monetary aggregates, in particular the growth rate of the bank credit allocated to the private sector.

Government and central bank might have incentive to care about the stability of monetary aggregates since there is an empirically proved strong long term relationship between inflation and money growth. Söderström (2005) demonstrates how a target for money growth can be beneficial for an inflation-targeting central bank acting under discretion. As the growth rate of money is closely related to the change in the interest rate and the growth of output, delegating a money growth target to the central bank makes discretionary policy more inertial, leading to better social outcomes. In comparing this delegation scheme with other schemes suggested in the literature, he finds that stabilizing money growth around a target can be a sensible strategy for monetary policy, although other delegation schemes are often more efficient.

In a dynamic context, central bank can lose the capacity of controlling inflation expectations with only the instrument of interest rate at its disposition. Independent central bank may verbally persuade the public that it has the firm intention of attaining its inflation target by building its credibility and by making its objective, preferences and operational procedures, data and economic model transparent to the public. But due to economic uncertainty, model uncertainty or operational errors, the central bank cannot always attain its objective. This result may induce some doubts of the public about the future realization of inflation target. Outside of equilibrium, the central bank has the risk of losing its persuasion power and all the verbal persuasion efforts may not be sufficient to convince the public to adhere entirely to its monetary policy strategy (Dai, 2007).

Furthermore, temporary but persistent shocks could make difficult the conduct of monetary policy only based on the control of interest rate.\* Workers, who have a finite horizon, could claim a compensation of fall in their purchasing power as soon as they observe a rise in the rate of inflation without awaiting the cancellation of current inflationary shocks by future shocks.

If these behaviors are dominant, rational expectations based on information restrained to the goods market and the Philips curve, as it is generally admitted in the research on inflation targeting, could irrelevantly reflect the expectation behavior of private agents. It is contrary to the essential idea of the rational expectations hypothesis, which stipulates that the private agents use any information available to form their expectations.

Consequently, one can reasonably suppose that information concerning the money and credit markets is used by the private sector. Considering the money market as device of coordination of private inflation expectations, Dai and Sidiropoulos (2003, 2005, 2009), Dai (2006, 2007), and Dai, Sidiropoulos and Spyromitros (2007) provide theoretical justifications of the utility of this market other than only determining in an endogenous way the money supply within a typical framework of inflation targeting.

These theoretical concerns also found some empirical echoes which show that money is not superfluous. Milton Friedman (2005), using data covering three periods of expansion in the USA and Japan, proves that the quantity of money exerts a determining effect on national revenue and stock prices. Hafer, Haslag and Jones (2007) discover that there is a significant statistical relationship between the delayed values of the money and the output, even when delayed values of real interest rate and output are taken into account. Adding the money into a dynamic IS model, Hafer and Jones (2008) find that money growth usually helps predicting the GDP and that the predictive power of short-term real interest rate is much lower than previous works have suggested. Their results imply that the omission of the money seems to come at a high cost for dynamic IS models like that employed by Rudebusch and Svensson (1999).

To understand the lacunae in the mainstream literature studying inflation targeting or interest rate rules, consider the traditional IS-LM diagram. By assuming that money is endogenous, the inflation targeting literature assumes that IS, LM and MP curves cross by divine coincidence at the same equilibrium point (Figure 1). The MP curve represents monetary policy stipulated in terms of interest rate rule and can be represented by a horizontal line if the interest rate rule does not depend on output.

In effect, by assuming that money supply automatically adjusts to demand, whatever is the interest rate chosen by the central bank, LM moves to cut the two other curves (IS and MP) at their point of intersection.

By assuming that money supply adjusts imperfectly to demand, given the inflation expectations, it is possible that these three curves do not cross at the same point as illustrated in Figure 2 after that some shocks have disturbed the initial equilibrium and dislocated these three curves. The resulting disequilibrium could lead private agents to modify their inflation expectations, allowing IS, LM and MP curves to shift so that, after some dynamic adjustment, these three curves cross again at the same equilibrium point.

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\* Random shocks can also take the appearance of persistent shock when the same shock repeats itself consecutively.

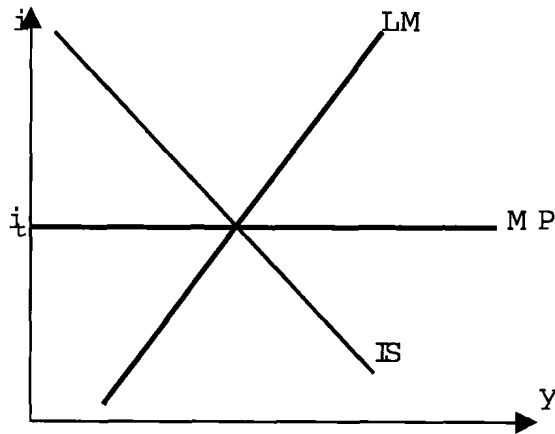


Figure 1. Money supply is perfectly elastic.

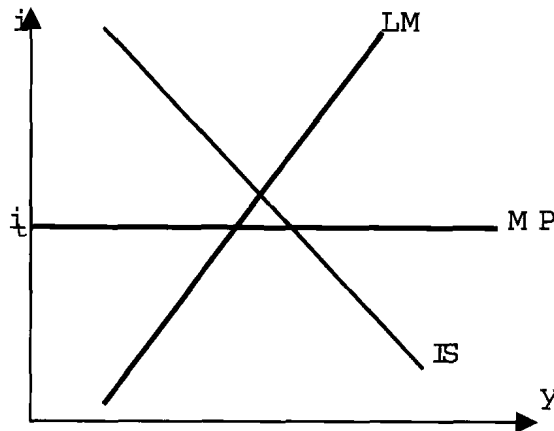


Figure 2. Money supply is imperfectly elastic.

As we have seen in the recent developments in financial markets, the central bank cannot easily control the interest rates (which correspond to the intersection point between IS and LM curves in Figure 2) at which the interbank loans and other lending are made. It can neither easily control the inflation expectations, since fear of deflation and fear of hyperinflation simultaneously appear in the actual financial turmoil.

Actually, many central banks (some of them are explicit inflation targeter) have massively injected the central liquidity to stabilize the financial markets. However, they do not do a symmetrical work during the boom period, i.e. reducing the liquidity when the economy is expanding too quickly. This reveals why the neglect of money in the inflation-targeting framework is one of the lacunae in its theoretical foundations.

The mainstream theories of inflation targeting assume that money and financial markets are perfect, and the central bank is perfectly credible and transparent. In the absence of inflationary bias and persistent shocks, these assumptions lead to the equality between the inflation target and the expected rate of inflation as well as the equality between the repo interest rate fixed by the central bank and the interest rate determined on financial markets.

We contest the view popular in the inflation-targeting literature according to which the central bank can be assumed to be completely credible in the sense that its inflation target automatically becomes the nominal anchor for current and future periods, thus evacuating the possibility that central bank could lack credibility and means to control inflation expectations.

In effect, this credibility cannot be always ensured due to the existence of financial and economic uncertainty. For example, when there are major and persistent supply shocks inducing an inflationary pressure, the central bank might have difficulty to explain why it cannot fight inflation without provoking either a fall of employment or a fall in real wages during an extending period.

The inflation-targeting literature focuses on the imperfections on the supply-side of goods and services and is completely unaware of those on money and financial markets. In order to ignore the later, it is implicitly assumed that these markets, in particular the money market, are perfectly functioning.

As all financial assets are implicitly assumed to be perfectly substitutable, controlling only the repo interest rate is equivalent to controlling all other lending interest rates. Consequently, the curve of money supply coincides with that of money demand and one can completely ignore the existence of money and financial markets in the theoretical construction of inflation targeting.

The assumption of imperfect money and financial markets allows understanding better the functioning of the economy and how a monetary policy is implemented. In effect, the central liquidity is not accessible at unlimited quantity because the central banks limit the quantity, the quality and the types of assets accepted as collateral as well as the types of financial institutions which have direct access to the central liquidity. That implies that there could be a potential imbalance (excess of liquidity or crisis of illiquidity) on the money market. Central bank's interventions defined in terms of injection or withdrawal of liquidity become essential.

These interventions have the advantage of being more flexible than the instrument of interest rate because the latter must generally follow a well defined trend and is only modifiable (except in the event of financial crisis) with much longer intervals separating two interest rate decisions.

The failure of transmission mechanism running from the repo interest rate to other interest rates as well as the zero bound for nominal interest rate could greatly limit the possibility of actions through fixing the nominal interest rate for central banks adopting inflation targeting. A central bank too aggressive in reducing the repo interest rate can quickly find itself without interest rate instrument and hence the means of sufficiently reducing the lending interest rates and anchoring the inflation expectations.

The imperfect money and financial markets hypothesis also gives a better account of the dynamic of inflation expectations. The evolutions of the expected rate of inflation deduced from the difference of return between the indexed and un-indexed obligations show that the inflation expectations are not as static as predicts the mainstream inflation targeting literature. Some introductory teachings treat the expected rate of inflation even as fixed in the presence of stochastic shocks (Romer, 2000; Walsh, 2002). Using information from money market and financial markets generally allows improving the inflation expectations of private sector compared to the case where private sector uses only information extracted from the interest rate rule, the Philips curve and the goods market equilibrium condition as it is admitted in the literature of interest rate rules and inflation targeting.



By assuming imperfect financial markets, we admit that the target of lending interest rate, decided by the central bank and expressed as optimal interest rate rule and function of other variables in the inflation-targeting regime, cannot be directly fixed and is not always realized due to malfunctioning of money and financial markets or shocks affecting these markets.

In effect, the central bank fixes the repo interest rate, which is determined by taking account of inflation and output targets and economic model (including money and financial markets). A modification of repo interest rate allows inducing a change in the interbank money market interest rate, affecting hence the lending interest rate determined on the credit or debt market at which firms and consumers can borrow.

If this transmission mechanism is perturbed by exogenous shocks or endogenous instability, adopting monetary targeting under inflation-targeting regime may have some advantages in terms of monitoring the inflation expectations and controlling the money market interest rate and the lending interest rate.

There is then some good reasons for the inflation-targeting central bank, by designing an appropriate money growth rule, to flexibly monitor the level of liquidity in the monetary market and hence in the economy (i.e., to target other interest rates) and to control the inflation expectations in order to ensure the dynamic stability for the economy.

The design of appropriate money growth rule is determinant for the success of monetary targeting since the renowned *k*-percent money growth rule of Milton Friedman is not successful. In effect, in an experiment of overlapping generations economies, Marimon and Sunder (1995) found no evidence that a 'simple' rule such as a constant growth of the money supply, can help coordinate agents' beliefs and help stabilize the economy.

### 3. Monetary Targeting versus Inflation Targeting

The strategy of monetary targeting (or targeting of monetary aggregates) comprises three elements: reliance on information conveyed by a monetary aggregate to conduct monetary policy, announcement of targets for monetary aggregates, and some accountability mechanism to preclude large and systematic deviations from the monetary targets (Mishkin, 2002).

Monetary targeting is generally associated with the monetarism. Even though the monetarism represents an important advance over prior conventional wisdom and the lessons learned from the monetarist controversy are not to forget, it has lost its steam in modern development of monetary theory and policy. Woodford (2008) argues that the most important of these lessons, and the ones that are of continuing relevance to the conduct of policy today, are not dependent on the thesis of the importance of monetary aggregates.\* In other words, the ECB's continuing emphasis on the prominent role of money in its deliberations is not theoretically well justified. It is explained by the concern not to ignore the lessons of the monetarist controversies of the 1960s and 1970s.

The monetary targeting experiences in major industrial countries are mitigated (Bernanke and Mishkin, 1992; Mishkin and Posen, 1997; Mishkin, 2002). It is found that while

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\* The most important lessons from the monetarism, according to Woodford (2008), are that monetary policy can do something about inflation, the central bank can reasonably be held accountable for controlling inflation and a verifiable commitment by the central bank to a non-inflationary policy is important.