

INFLATION TARGETING, DEVELOPING COUNTRIES AND PRELIMINARY CONSIDERATIONS FOR TURKEY

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The major objective of this paper is to analyze the applicability of an inflation targeting framework in Turkey. Moreover, the paper considers whether the prerequisites for an effective inflation targeting strategy are present in developing countries. After discussing the implications of inflation targeting framework for Turkey, this article concludes that it would not be feasible for Turkey to adopt such a framework for monetary policy. Turkey must eliminate the fiscal roots of the inflation process and solve its public debt problem before adopting explicit inflation targeting. In addition, we examined the predictive content of various economic variables for inflation in order to determine the statistical readiness of Turkey to meet the requirements of inflation targeting. The empirical evidence presented in this paper suggest that the main factor behind the inflationary process is fiscal imbalances and that money supply shocks are not the driving force of inflation in Turkey.

I. Introduction

Several advanced economies have adopted a framework for monetary policy that has become known as Inflation Targeting in the 1990s. This type of monetary policy has been successfully employed in many industrial countries where it enhanced policy transparency and accountability. In most cases, this framework was intro-

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duced after unsuccessful attempts to target the nominal exchange rate or some monetary aggregate. Furthermore, a growing number of developing countries have recently adopted inflation targeting as their monetary policy strategy, and many more are considering future adoption of this new framework.

After the implementation of pegged exchange rate regimes in Latin American and East Asian countries caused serious financial crises, inflation targeting has become an increasingly attractive alternative for several emerging market countries. However, some of the prerequisites for effective inflation targeting are largely absent in many developing countries. Although inflation targeting may not be appropriate for many developing countries, it can be viewed as a useful monetary policy framework for a number of them (Mishkin, 2000).

The number of emerging market countries explicitly practicing inflation targeting have increased rapidly in recent years, including Chile, Colombia, Brazil, The Czech Republic, Israel, Korea, Mexico, Peru, Poland, South Africa and Thailand. This paper reviews the literature for investigating the relevance of inflation targeting for developing countries. Furthermore, the main purpose of this paper is to analyze the applicability of inflation targeting framework to Turkey and present some empirical evidence on the leading indicators of inflation in the Turkish economy.

The remaining part of this paper is organized as follows. Section 2 presents main elements of inflation targeting. Section 3 examines the applicability of inflation targeting in developing countries. Section 4 investigates the relevance of inflation targeting framework in the Turkish economy. Section 5 explores the leading indicators of inflation in Turkey. Section 6 contains a summary and concluding remarks.

2. Conceptual Framework for Inflation Targeting

2.1. A General Perspective

Inflation targeting is based on the idea that the primary goal of monetary policy in any country should be attaining and preserving a low and stable rate of inflation. The main characteristic of this framework is that the central bank is given a clear mandate to concentrate on achieving an explicit inflation target as the fundamental goal of monetary policy. Given the strategy of inflation targeting, monetary policy is clearly derived from the central bank's established target.

Inflation targeting is a framework for monetary policy that contains five essential elements: (i) the public announcement of a medium-term target for future inflation at some low level or range; (ii) clear and unambiguous acknowledgements that the attainment of the inflation target constitutes the overriding objective of monetary

policy in the sense that it takes precedence over all other objectives; (iii) an information-inclusive strategy in which many macroeconomic variables are utilized for determining the setting of policy instruments; (iv) a relatively high degree of transparency of monetary policy through increased communication with the public about the objectives of monetary policy strategy, and increased accountability of the central bank; (v) periodic assessments of expected inflation over the relevant horizon on the basis of a set of variables.

An inflation targeting regime includes a forward looking operating procedure in which the setting of policy instruments depends on the assessment of inflationary pressures. Thus, it requires a model for producing inflation forecasts that employs a number of variables and indicators containing information on future inflation. In addition, monetary authorities of an inflation targeting country ought to possess the technical and institutional capacity to model and forecast domestic inflation, have some knowledge or estimate of the time it takes for the determinants of inflation to have their full effect on the inflation rate, and have a well-informed view of the way in which monetary shocks influence the fundamental macroeconomic variables as well as of relative importance of various policy instruments.

Since inflation targeting as actually implemented is very far from a rigid rule, the interpretation of inflation targeting as a rule is incorrect and results from a confusion that has been created by the rules-versus-discretion debate (Mishkin, 1999). Indeed, the central banks of inflation targeting countries maintain significant scope for applying discretion in the conduct of monetary policy and employ all available information to determine what are the appropriate policy actions to achieve a medium-term inflation target. Inflation targeting does not imply a specific operational rule for the monetary policy instruments used by the central bank, and never requires the monetary authorities to ignore information and focus solely on one key variable. In addition, central banks of inflation targeting countries have left themselves considerable scope to respond to economic growth and fluctuations through a number of instruments (Mishkin and Bernanke, 1997).

The prerequisites needed to adopt an inflation targeting framework for monetary policy include an absence of other nominal anchors, an institutional commitment to price stability, an absence of fiscal dominance, policy instrument independence, and policy transparency and accountability. The first requirement that must be satisfied by any country considering the adoption of this framework for monetary policy is to have a central bank capable of pursuing the inflation goal free of constraints on its use of monetary policy instruments. This does not necessarily mean that the central

bank must be fully independent but, more modestly, that it must be free to use the monetary policy instruments in the pursuit of the inflation goal (instrument independence)-i.e., it is not necessary that central bank is free to set its own goals (goal independence). While industrial countries generally comply with this requirement, the degree of compliance with this prerequisite of inflation targeting is low for the majority of developing countries.

A second requirement is that the conduct of monetary policy will not be dictated or severely constrained by fiscal developments (fiscal dominance). In an inflation targeting framework, this implies that the government will not rely systematically and significantly on the revenues from seignorage, that domestic capital markets are sufficiently developed to absorb placements of public debt instruments, and that growing public debt stock will not generate explosive dynamics (Masson, et al., 1997). If this prerequisite for inflation targeting are not satisfied, then inflationary pressures of a fiscal origin may arise, gradually undermining the effectiveness of monetary policy to attain an inflation target.

A third requirement for adopting inflation targeting is the absence of commitments to objectives that might conflict with low inflation. Therefore, monetary policy cannot be used to target the exchange rate or any other nominal variable. Indeed, monetary policy is subordinated to the exchange rate objective in a fixed exchange rate regime and in this case monetary authorities are unable to target any other nominal variable on a lasting basis. On the other hand, some variants of fixed exchange rate regime such as crawling pegs or target zones permit the authorities to gear monetary policy at an inflation target in addition to the exchange rate. Then, an inflation target could theoretically coexist with a nominal exchange rate target, provided that the inflation target has priority if the exchange rate target conflicts with the inflation target (Leiderman and Svensson, 1995).

2.2. Advantages and Disadvantages of Inflation Targeting Framework

The main advantage of adopting an inflation targeting strategy - compared with a framework based on exchange rate targeting - is to leave significant scope for the conduct of monetary policy, thus provides the central bank with flexibility to deal with aggregate demand and supply shocks. In contrast to a monetary framework based on targeting money growth, inflation targeting has the advantage that velocity shocks are largely irrelevant because monetary policy strategy does not depend on a stable relationship between money and inflation. In fact, the central bank will

employ all available information for appropriately setting monetary policy (Mishkin, 1999).

A second advantage of an inflation targeting regime is that it is easily understood by the public and is therefore highly transparent. The central banks of inflation targeting countries have intensified its efforts in communicating with the public and the markets about the objectives of monetary policy. Moreover, the enhanced transparency concerning inflation targeting implies that the central bank becomes more accountable about their actions in the public debate. Thus, inflation targeting is capable of reducing the likelihood that the monetary authority will attempt to expand output and employment by following overly expansionary monetary policy (the time-inconsistency trap).

An inflation targeting framework, however, is not without potential problems as indicated by critics of this monetary framework. Compared to a monetary policy strategy based on targeting money growth or the nominal exchange rate, it is difficult for the central bank to control inflation in an inflation targeting regime. This is a very serious problem for developing countries that are attempting to reduce inflation from relatively high levels. Thus, it is more likely to experience large inflation forecast errors in those circumstances. As a result, it is suggested that inflation targeting is more effective if it is phased in only after some disinflation has previously been achieved (Masson et al. 1997; Bernanke et al. 1999; Mishkin 1999). This kind of strategy was followed by Chile which phased in inflation targeting gradually after initial success in reducing inflation (Mishkin, 2000). Furthermore, the existence of government-controlled prices may increase the difficulty of controlling inflation in developing countries. Therefore, the implementation of inflation targeting regime may require a high degree of coordination between the central bank and fiscal authorities on the timing and magnitude of future changes in controlled prices.

Another potential problem with inflation targeting is that it may lead to low and unstable growth in output and employment in the short run. The introduction of inflation targeting framework involves the risk that an initial disinflation process could generate short-term output costs if the economic agents do not find the monetary policy strategy credible. However, once low inflation levels are achieved, output and employment will return to their previous levels. On the other hand, short-term output costs can be lowered if the central bank explains its goal more clearly or the government endorses the inflation targeting framework more explicitly.

Moreover, an inflation targeting regime provides no guarantee that the monetary authority will successfully use its discretion for appropriately setting the monetary

policy strategy. In contrast to exchange rate targeting and monetary targeting, inflation targeting is more complicated to implement. The forward-looking operating procedure of inflation targeting requires that the central bank must have a decent model for producing inflation forecasts and monetary policy instruments which influence the inflation with reasonable precision (Jonsson, 1999).

Finally, one of the shortcomings of inflation targeting for some developing countries is that a high degree of dollarization may generate a significant problem for an inflation targeting regime. Indeed, in most developing countries with debt contracts denominated in dollars, large depreciations of domestic currency may increase the burden of debt, leading to substantial deterioration in balance sheets. However, an inflation targeting framework necessitates a high degree of exchange rate flexibility. As a result, exchange rate fluctuations in an inflation targeting regime may increase the risks of a financial crisis especially in emerging market countries (Mishkin, 2000). Thus, developing countries cannot ignore the exchange rate fluctuations under an inflation targeting framework, but it is clear that inflation target takes precedence over the exchange rate objective. On the other hand, it is also argued that inflation targeting may not be feasible in partially dollarized economies unless the financial institutions are strictly supervised to ensure that the domestic financial system is able to withstand exchange rate shocks.

3. The Feasibility of Inflation Targeting in Developing Countries

This section considers the relevance of a monetary policy regime based on inflation targeting for developing countries. It is generally accepted that developing countries constitute a very heterogeneous group due to the diversities of monetary experiences and differences in the degree of financial development. For some of the developing countries where the rate of inflation has stayed in the chronic to high range (i.e., above 30-40 percent per annum) for a number of years, it can easily be argued that the basic requirements for adopting inflation targeting are not satisfied (Masson, et al., 1997). In situations like this, the foremost priority of economic policy should be achieving a lasting reduction in inflation through the implementation of a comprehensive stabilization program. Inflation targeting framework can only be an option once the fiscal sources of inflation are eliminated and the rate of inflation is reduced to moderate levels.

On the other hand, inflation targeting is not an option for some countries that belong to a monetary (currency) union or that prefer to fix their nominal exchange rate to the currency of the anchor country (Masson, et al., 1997). In these countries

where the monetary policy is subordinated to the exchange rate objective, the central banks are committed to giving priority to preserving the parity if a conflict arises between objectives.

One of the main prerequisites for the adoption of an inflation targeting regime is the absence of a fiscal dominance in any country. The most common manifestation of fiscal dominance is perhaps the reliance on seigniorage. In developing countries the reliance on seigniorage is considerably higher than in industrial countries because of some structural reasons (Easterly, et al., 1994). The strong tendency of these countries to abuse this source of revenue stems mainly from a concentrated and unstable sources of tax revenue, poor tax collection procedures, a highly unequal income distribution, inefficient bureaucracy and corruption.

Moreover, another manifestation of fiscal dominance is a fragile financial system with a poorly supervised, weak banking structure. The financial liberalization hypothesis, first advanced by McKinnon (1973) and Shaw (1973), claims that government restrictions on financial intermediaries (such as interest rate ceilings, high reserve requirements and sectoral credit policies) have discouraged financial intermediation and, consequently hindered the development of domestic capital markets. On the other hand, in the aftermath of financial sector reforms, the conflicts between the objectives of controlling inflation and preserving banking sector profitability may occur in some emerging market countries. Indeed, recent empirical evidence indicate that banking crises have been more severe in emerging market countries than advanced economies. In fact, fiscal dominance and a poor financial market infrastructure constrain effective instrument independence by the central bank and the scope for an independent monetary policy in some developing countries. Therefore, in such developing countries, a comprehensive public sector reform is needed to broaden the tax base, diminish the reliance on seigniorage, reduce inflation to low double-digit levels, and give strength to the financial system (Fry, et al., 1996).

Even if emerging market countries satisfy the certain prerequisites of an inflation targeting such as moderate to low levels of inflation, developed financial markets, and absence of fiscal dominance, the scope for monetary policy will be dependent on the exchange rate regime chosen and on the extent of international capital mobility (Masson, et al., 1997). The standard Mundell-Fleming model predicts that the scope for independent monetary policy in a small open economy is inversely related to the degree of fixity of the nominal exchange rate and to the degree of international capital mobility. In practice, most of the developing countries have

adopted a variety of flexible, though still managed, exchange rate regimes. On the other hand, there has been a substantial rise in capital flows to these economies over the past decade. Since these two trends have opposite effects on the scope for independent monetary policy, it is not easy to determine a priori the net effect.

On the other hand, there are some other developments which make the tasks of conducting and evaluating monetary policy in developing countries more difficult. First, the exchange rate objective has not lost its importance for these countries despite flexible exchange rate arrangements. Second, most of the emerging market countries have continued to use the exchange rate to guide monetary policy. Furthermore, it has been claimed that the process of economic stabilization and financial reform implemented by these countries since 1980s have increased money demand instability, therefore diminishing the informational content of monetary aggregates (Arrau, et al., 1995).

Although an effective inflation targeting framework requires that the inflation target takes priority over all other objectives, this condition is difficult to satisfy in the context where exchange rate stability is also a stated or implicit objective of monetary policy (as in the case of Israel). The Bank of Israel has employed both inflation and exchange rate targets in the formulation of its monetary policy since 1991. It has been observed that the consistency between the inflation and exchange rate targets has been under severe strains on many occasions during this period because of large capital inflows (Masson, et al. 1997). In general, the monetary policy dilemma has eventually been resolved in favor of the inflation target and the monetary authorities have widened the band for the exchange rate gradually. However, these monetary policy operations have sometimes required a heavy intervention in the market. As long as an inflation target coexists with an exchange rate objective, the benefits from adopting an inflation targeting regime will be necessarily lower and the potential for conflict will remain unsolved in the context of emerging market economies (Masson, et al. 1997).

Another factor creating difficulty for developing countries to implement an inflation targeting regime has been the absence of a coherent analytical framework for evaluating empirically the effects of monetary policy and obtaining inflation forecasts. This may constrain both the monetary authorities' capacity to formulate monetary policy and the external observers' ability to evaluate monetary developments. Empirical studies attempting to model the monetary transmission mechanism are very rare in developing countries. On the other hand, empirical research on the process of inflation determination for these countries generally does not rely on nat-

ural rate models (NAIRU). However, the applicability of this type of models to developing economies is still under dispute (Coe and McDermott, 1997).

Furthermore, the implementation of an inflation targeting regime in many developing countries will require more complicated assessments about the specification of the inflation target. First, in most developing countries, a consensus about the optimal inflation rate does not exist. Thus, any choice of an inflation target for these economies may be arbitrary. However, it is argued that developing countries should adopt a higher inflation target than that of developed countries (i.e., in the range of 4 to 8 percent per annum). Secondly, there is no agreement on the appropriate speed of convergence to the inflation target in emerging market countries. While Dornbusch et al. (1995) offer a cautious and gradual approach to disinflation, others disagree. Thirdly, the choice of price index is more problematic in emerging market countries than in advanced countries. Since these countries are subject to a variety of supply shocks, it is sometimes argued that some volatile items should be removed from the core inflation. However, some argue that the inflation target should be defined in terms of the index that is most widely used by the public. Lastly, administered or controlled prices are a significant component of price indices in the majority of developing countries. In such circumstances, a proper model for producing inflation forecasts is needed to include explicit assumptions about the timing and magnitude of changes in those prices. As a result, this situation requires a high degree of coordination between the central bank and fiscal authorities.

3. The Scope for Inflation Targeting in Turkey

In December 1999, the Turkish government started to implement an exchange rate-based disinflation program with the supervision and technical support of the IMF. The program entailed exchange rate based disinflation and monetary control by setting the liquidity generation mechanism to the net foreign asset position of the Central Bank. Since the Central Bank practiced a policy of no sterilization, it acted as a semi-currency board (Yeldan, 2001). In addition, the disinflation program set specific targets for non-interest fiscal surpluses. However, the first post-stabilization crisis came quickly in November 2000. The banks with highly-leveraged positions started to sell government securities, creating a severe liquidity shortage in the domestic economy. International speculative capital fled the country and interest rates reached to very high levels. Only after IMF granted additional support in December 2000 and the technical limits of the monetary program were revised, the continued implementation of the disinflation program have been secured. However,

shortly after this rearrangement with the IMF, the exchange rate-based disinflation program ended in February 2001 as a result of serious financial crisis. It is now well known that there is a strong association between pegged exchange rates and financial crises. Fischer (2001) has admitted that 'each of the major international financial market related crises since 1994 - Mexico in 1994, Thailand, Indonesia and South Korea in 1997, Russia and Brazil in 1998, and Argentina and Turkey in 2000 - has in some way involved in a fixed or pegged exchange rate regime'.

Following the collapse of the exchange rate based disinflation program in February 2001, the Turkish government let the exchange rates to free float. The Central Bank of Turkey has announced that it is planning to adopt direct inflation targeting framework by the end of 2002. The preceding section has made a number of references to a group of developing countries where some serious obstacles to the adoption of an inflation targeting regime exist. Some of the prerequisites needed to adopt an inflation targeting framework for monetary policy are satisfied in the case of Turkey. As far as inflation targeting concerned, one of the basic requirements is the announcement of independence of Central Bank by law. In Turkey, the Central Bank has a high degree of instrument independence. One serious problem with respect to inflation targeting is chronic high inflation in Turkey. Hence, a substantial disinflation should be achieved before implementing an inflation targeting strategy in Turkey. After reducing inflation to moderate levels, official inflation targets for inflation can be announced by the government or monetary authorities.

There is not any strong commitment by the Central Bank of Turkey to target other nominal variables that might conflict with the inflation objective. However, movements of the exchange rate are clearly a major concern of monetary authorities in Turkey and in other emerging market countries. Changes in the exchange rate have a significant influence on the inflationary process in Turkey. Furthermore, the public and the markets pay attention to the exchange rate, putting pressure on the monetary authorities to change monetary policy. A depreciation of the domestic currency is generally perceived as a signal of failure of the monetary authorities even if this view is incorrect (Mishkin, 2001). Thus, the fact that exchange rate movements are a serious concern in Turkey increases the risk that the Central Bank may put too much focus on restraining exchange rate fluctuations. The major problem from a focus on limiting exchange movements is that it increases the possibility of transforming the exchange rate into a nominal anchor. Another problem is that the effect of changes in exchange rates on inflation and economic activity can differ significantly depending on the nature of the shock. A depreciation of the domestic curren-

cy due to portfolio shocks requires a contractionary monetary policy in order to control inflation. On the other hand, a depreciation from a real shock requires a different monetary policy response (Mishkin, 2001).

The major obstacle to the implementation of an inflation targeting regime is the existence of fiscal dominance in Turkey. One of the requirements for an inflation targeting regime is that the conduct of monetary policy will not be dictated or severely constrained by developments of a fiscal nature. On the other hand, it has been widely accepted that the main factor behind the inflationary process in Turkey is fiscal imbalances. The empirical evidence portrayed by Metin (1998) reveal a strong relationship between budget deficits and inflation during the 1948-1985 period. While some empirical studies find a weakened link from fiscal deficits and monetary growth to inflation in the post 1985 period, they have stressed that inflation is a inertial process in Turkey (Akçay, et al., 1996).

It has been observed that seigniorage revenues have tended to fall in the face of increasing budget deficits during the past decade. However, even when monetary authority does not monetize the fiscal deficit, higher deficit policies may very well generate inflation. In their "unpleasant monetarist arithmetic", Sargent and Wallace (1981) showed how debt financing of a permanent deficit today may necessitate faster money growth in the future, yielding higher inflation not only eventually but starting today. If permanent fiscal deficits are financed only by increased borrowing, then the fiscal burden of the government will have to increase, finally requiring the creation of additional money. On the other hand, if future deficits are desired to be avoided, then the monetary authority will have to monetize the deficits, thereby generating the expectation of higher future inflation. As a result, the high rates of inflation anticipated in the future tend to increase the current inflation. Thus, Sargent and Wallace indicate that a contractionary monetary policy may not produce even a temporarily lower inflation in certain circumstances.

On the other hand, another transmission mechanism leading to higher inflation is based on crowding out effects of public deficits. The debt financing of deficits will crowd out private investment due to higher interest rates, lowering the rate of economic growth. If money supply is held constant and the level of output declines, inflation will tend to increase. In addition, high interest rates encourage the new financial instruments such as interest-bearing assets that are almost as liquid as money in high inflation countries. Thus, therefore monetization can be realized by the financial sector (Miller, 1983).

Unstable debt dynamics have important implications for economic and fiscal policies. If fiscal policy are perceived to be unsustainable by the public, then this situation will negatively affect market sentiment towards economic outlook, leading to an increase in risk premium. Employing annual data for 1970-2000 period, Akçay et al. (2002) examined empirically the sustainability of fiscal policies in Turkey. The empirical findings of the authors reveal nonstationarity in the discounted debt to GNP ratio process, indicating an unsustainable fiscal outlook. On the other hand, the link between explosive debt dynamics and economic growth performance has been analyzed by some recent empirical studies (Easterly, 2001). According to these recent findings, the growth slowdown in the world is a major factor explaining the debt burden problems of developing countries. Thus, the best kind of fiscal policy to solve the debt problems of developing countries is to take growth-enhancing measures.

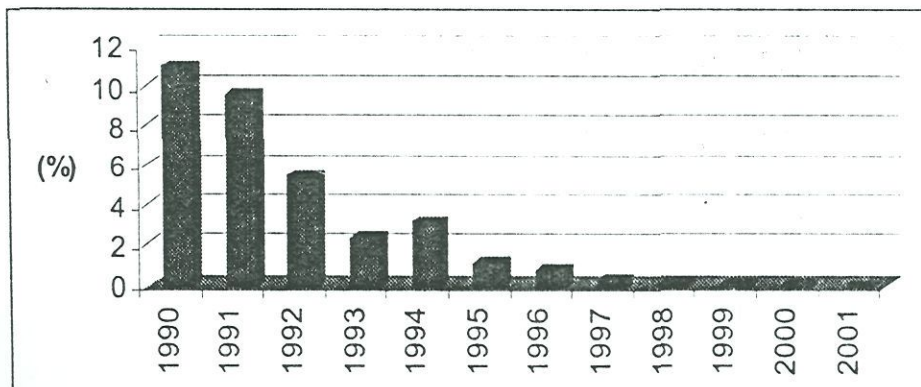
The economic policy-makers in Turkey must recognize that macroeconomic stability and sustainable economic growth necessitate sound fiscal policies. With the new policy regime of post-1980, several measures were taken to reduce the role of the Central Bank as the basic source of the deficit finance. Since the government's access to the Central Bank resources has been heavily restricted during the post-1980 period, the debt finance has become the major source for financing fiscal deficits. The main motivation behind the shift from monetization to internal debt finance may be explained by the government's desire to avoid the acceleration of inflation through the monetary growth. However, an increasing reliance on domestic debt finance has generated an interest payments explosion due to a large internal debt stock and very short debt maturities (Özmen and Koğar, 1998). Especially after 1986-87 period, both the deficit dynamics and deficit financing policies in Turkey changed drastically. Following 1986, the public sector borrowing requirement (PSBR) started to increase gradually, reaching over 17 percent in the year 2001. The share of foreign borrowing in PSBR decreased significantly while the share of domestic borrowing continued to increase. It can be argued that the public debt dynamics of Turkey have been on an unstable path since 1990 (Ertuğrul and Selçuk, 2001).

In the past decade, political economy literature emphasized significant relations between social conflicts, inequality in distribution of income, and fiscal deficits (Roubini, 1991). A large part of this theoretical and empirical work shows that conflicts between different social classes and a highly unequal distribution of income cause a greater fiscal imbalance. The fundamental conflict in these models is about

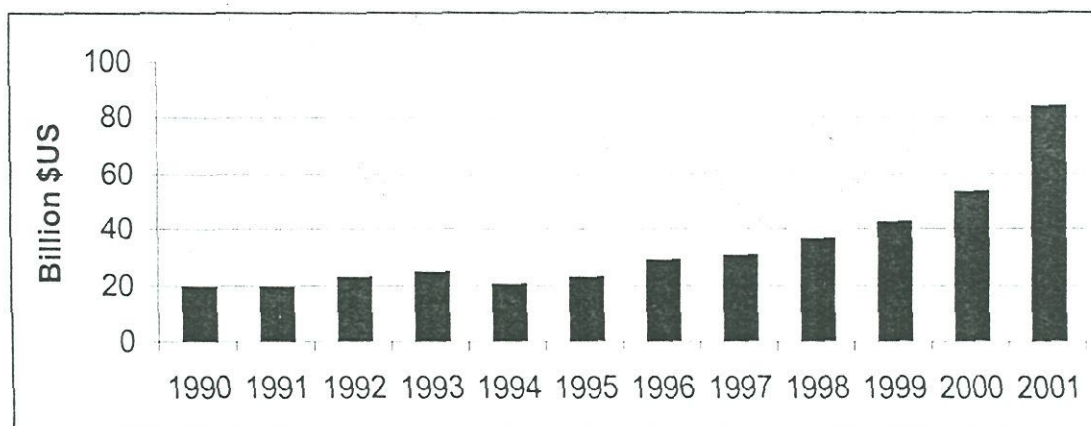
which social class in the society will bear the tax burden. In addition, a number of studies from Latin American populism argue that an uneven income distribution is a significant source of social and political conflict and, therefore the consequent political instability will generate public deficits in developing countries (Roubini, 1991). According to this analysis, an unfair distribution of income increases the social pressures for 'overly expansionary redistributive budgetary policies and enhances the power of economic elites to resist taxation needed to balance the budget'.

With an inefficient public sector by the standards of other middle-income countries, Turkey used public expenditure cuts rather than tax increases to balance the budget (Eichengreen 2001). Turkey's May 2001 program, "Transition to the Strong Economy", relied on reductions in non-interest public spending for more than two-thirds of the improvement in the primary budget balance of the government. However, the problem with this approach is that the substantial cuts in public expenditures reduce aggregate demand and that less demand leads to lower rate of economic growth. The slowdown in economic growth in turn decreases the tax base relative to interest costs. Although the Turkish government has changed its primary balance from a 2.5 per cent of GDP deficit in 2000 to a projected 6.5 per cent of GDP surplus in 2002, the central government consolidated budget deficit has continued to increase during the same period (Eichengreen, 2001). Some fiscal indicators of Turkey and the declining trend of seigniorage revenues are presented visually in Figures 1 through 4.

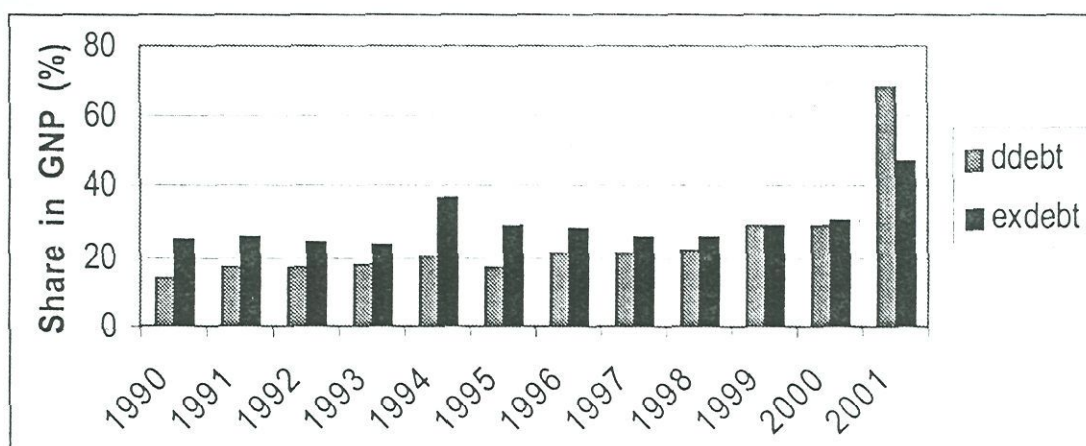
Figure 1. *Seigniorage Revenues in Turkey (%)*



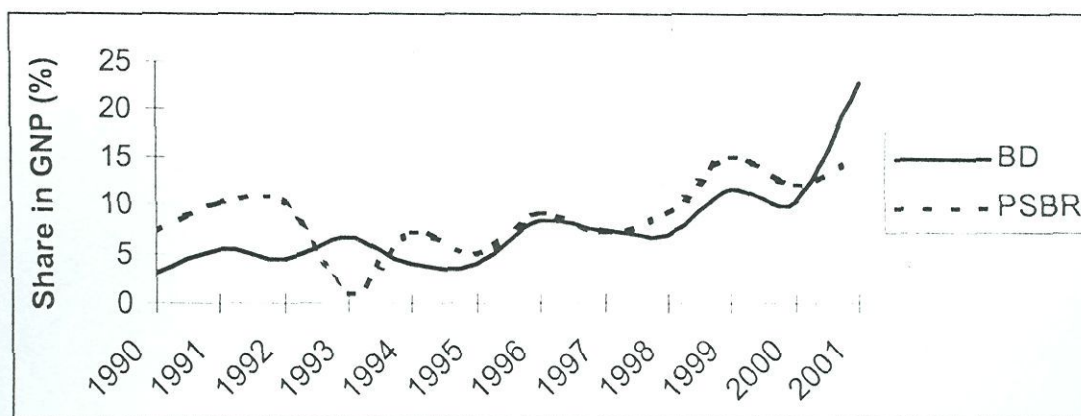
Source: *The Central Bank of Turkey. Note: Seigniorage is defined as a ratio of annual percentage change in broad money (M2) to nominal GNP.*

Figure 2. *The Explosive Dynamics of Domestic Debts in Turkey*

Source: The Undersecretariat of Treasury, Turkey.

Figure 3. *The Shares of Domestic and External Debts in GNP (%)*

Source: The Undersecretariat of Treasury, Turkey.

Figure 4. *Budget Deficit and Public Sector Borrowing Requirement in Turkey (Shares in GNP (%))*

Sources: The Undersecretariat of Treasury and The Central Bank of Turkey.

4. Leading Indicators of Inflation in Turkey

In this section, the statistical linkages between various leading indicators of inflation and inflation are investigated. Our approach is pragmatic in that the choice of variables is guided by previous work. All data used in this empirical analysis are taken from the electronic data delivery system of the Turkish Central Bank (www.tcmb.gov.tr). To examine the relationships between inflation itself and leading indicators of inflation, quarterly data for the period 1989:2-1999:4 are used. The set of indicator variables are the Turkish Lira-U.S. dollar exchange rate (EX), the one-month deposit rate (IR0), the three-month deposit rate (IR1), the six-month deposit rate (IR2), base money (MB), narrow money (M1), broad money (M2), broader money (M2Y), the output gap (OG)1, budget deficit (BS), and the Public Sector Borrowing Requirement (PBR). The inflation rate (INF) is measured by the consumer price index (CPI, 1987=100).

All of these variables are measured as twelve-month growth rates except PBR that is expressed as a share of GNP. Using conventional augmented Dickey-Fuller (ADF) and Phillips-Perron tests, the time series properties of the series were examined (results available upon request). The results of these tests, not reported here, indicate that most of the indicators are integrated of the first order $I(1)$ (INF, EX, MB, M1, M2, M2Y, BS, and PBR). On the other hand, some of the variables are level stationary (IR0, IR1, IR2, and OG). Having established the order of integration of individual time series, we then proceed to investigate the causality relationships by implementing Granger (1969) noncausality tests.

To explore the bivariate relationships between inflation and the quarterly economic indicators, the probability (P)-values from bivariate Granger noncausality tests are reported in Table 1. Each row of the table corresponds to an economic indicator. Table 1 contains eight columns corresponding to 1 through 9 lags in the bivariate regressions. Each entry in the table gives the P-values for the null hypothesis that the economic indicator does not Granger-cause the inflation for the Turkish data.

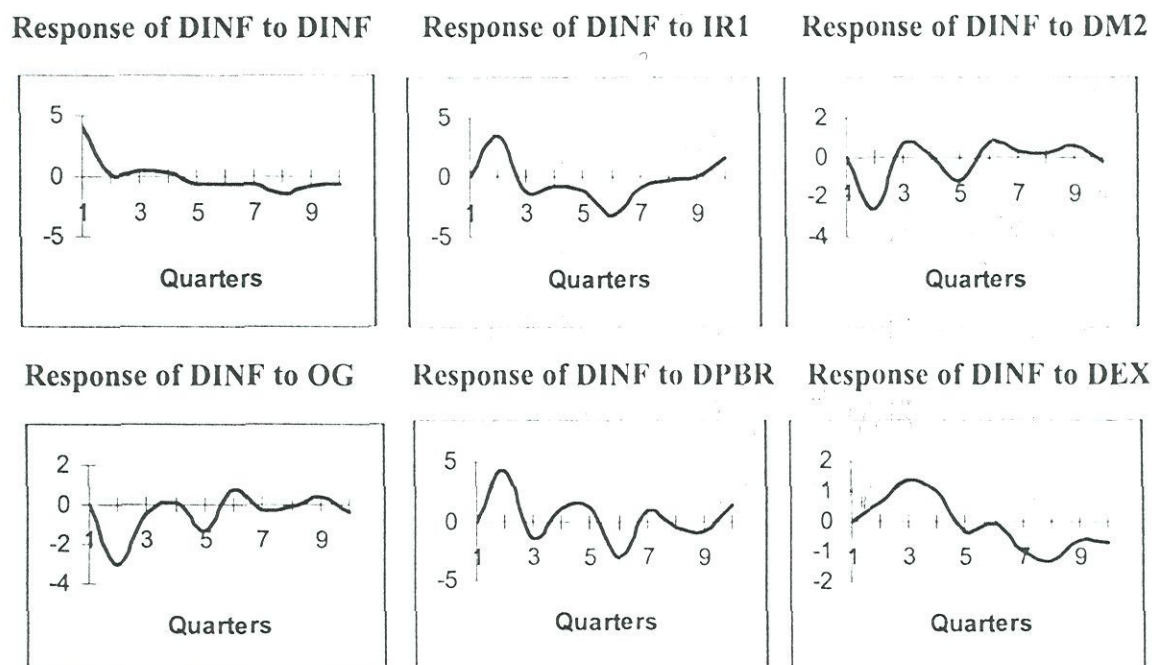
Table 1. *Leading Indicators: P-Values from Bivariate Granger Causality Tests*

Lags:	1	2	3	4	5	6	7	8	9
DEX	0.030	0.050	0.004	0.091	0.052	0.056	0.033	0.238	0.343
IR0	0.665	0.934	0.983	0.095	0.181	0.086	0.142	0.318	0.250
IR1	0.028	0.032	0.066	0.036	0.029	0.060	0.106	0.213	0.131
IR2	0.921	0.750	0.835	0.037	0.071	0.044	0.085	0.223	0.148
DMB	0.290	0.518	0.727	0.971	0.987	0.993	0.740	0.991	0.770
DM1	0.220	0.112	0.312	0.596	0.752	0.722	0.758	0.806	0.905
DM2	0.462	0.114	0.009	0.527	0.730	0.854	0.607	0.695	0.731
DM2Y	0.277	0.435	0.109	0.610	0.802	0.899	0.936	0.921	0.919
OG	0.000	0.001	0.000	0.004	0.003	0.009	0.023	0.227	0.388
DBS	0.945	0.992	0.945	0.966	0.532	0.707	0.585	0.832	0.416
DPBR	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Note: *D* denotes first differences.

The test results of Granger noncausality in Table 1 demonstrate that the public sector borrowing requirement (PBR) is significant across all lag orders. Other variables that are significant at the conventional levels for some lags include the exchange rate (DEX), the interest rate variables (IR0, IR1, and IR2), broad money (M2), and output gap (OG). On the other hand, among the monetary base (DMB), narrow money (M1), broader money (DM2Y), and the budget deficit (DBS), none appear significant at any lag order. While the empirical evidence reject Granger-causality from consolidated budget deficit to inflation at conventional levels, the PBR Granger-cause inflation rate across all lag orders. This result implies that the PBR is a much better indicator of fiscal deficits compared to the consolidated budget deficit.

A significant drawback of crude Granger noncausality testing is that bivariate analysis gives a rough indication of the statistical relationships between inflation itself and leading indicators of inflation (Christoffersen and Wescott, 1999). The omitted variable bias may distort the estimation results significantly. Hence, the insights gained in the bivariate analysis above will be utilized to specify and estimate a multivariate model for inflation. The model specified is vector autoregression (VAR) which allows for an analysis of the dynamic relationship between inflation and economic indicators using impulse response functions. (see Hamilton (1994) for a detailed and technical discussion of VAR methodology). The responses of inflation to leading economic indicators are presented visually in Figure 5.

Figure 5. Impulse-Response Functions

Furthermore, variance decompositions measure the relative contribution of forecast error variance of each shock as a function of forecast horizon. The variance decomposition is a convenient measure of the relative importance of such shocks to the system. The forecast error variance decomposition describes the proportion of the movements in a sequence due to its own shock versus shocks to the other variable. To establish the importance of each shock on inflation as a determinant of the movements in the rate of inflation, the variance composition is presented in Table 2.

Table 2. Variance Decomposition of Inflation (CPI)

Quarters	DINF*	IR1*	DM2*	OG*	DPBR*	DEX*
1	100.0	0.000	0.000	0.000	0.000	0.000
2	26.64	18.25	11.61	14.99	27.92	0.585
3	24.27	18.86	11.08	13.83	28.68	3.290
4	23.42	18.90	10.67	13.32	29.20	4.479
5	22.31	18.98	11.58	14.41	28.47	4.249
6	18.08	25.28	9.635	11.95	31.70	3.351
7	18.04	25.37	9.379	11.65	31.33	4.219
8	19.26	24.52	9.026	11.21	30.39	5.591
9	19.51	23.97	9.058	11.07	30.53	5.856
10	18.93	24.99	8.665	10.63	30.78	6.001

Notes:* relative contributions (in %). *D* denotes first differences. The lag length of the VAR model was set to 2.

Table 2 reports the results of variance decompositions in inflation owing to shocks in five economic indicators (IR1, DM2, OG, DPBR, and DEX). Variance decompositions measure the relative contribution of forecast error variance of each shock as a function of forecast horizon. The contribution of the public sector borrowing requirement (PBR) disturbances to inflation is about 31 percent at ten quarters. Table 2 indicates that the forecast error variance in inflation are largely explained by changes in the public sector borrowing requirement (PBR), the interest rate (IR1), and the own shocks of inflation. Money supply shocks are not the driving force of the inflationary process in Turkey. It can be argued that money has accommodated inflationary shocks coming from other sources. Consequently, the empirical evidence presented in this paper support the view that the inflationary process in Turkey is driven mainly by fiscal deficits and debt-financing of deficits. On the other hand, the exchange rate can explain only six percent of the variations in inflation at 10 quarters.

5. Summary and Conclusion

Inflation targeting serves as a monetary policy strategy in a number of developing countries as well as in several industrial economies. The prerequisites for an effective inflation targeting strategy are not present in many developing countries. A heavy reliance on seigniorage, underdeveloped financial markets, and fragile banking systems tend to limit the scope for implementing inflation targeting in most of the developing countries. A large number of emerging market economies exhibit significant symptoms of fiscal dominance. Furthermore, the requirements for adopting this framework such as low inflation (less than 10 percent), considerable exchange rate flexibility, and independence of the central bank are rarely found in these countries.

This paper has attempted to analyze the applicability of an inflation targeting framework in Turkey. It can be argued that Turkey satisfies some of the prerequisites for adopting an inflation targeting regime, including a flexible exchange rate regime, an independent central bank, and relatively developed financial markets. Turkey has experienced chronic high inflation in the past three decades. Therefore, a lasting reduction in inflation should be achieved through a comprehensive stabilization program before adopting an inflation targeting framework in Turkey. However, the major obstacle for an inflation targeting framework is the existence of fiscal dominance in Turkey. Conducting a monetary policy framework based on inflation targeting will only be feasible once fiscal roots of the inflation process are eradicated.

The fiscally-driven inflation in Turkey will make the country vulnerable to inflationary process of a fiscal origin, gradually undermining the effectiveness of monetary policy to attain an inflation target. As a consequence, the central bank will follow an increasingly accommodative monetary policy. Some recent empirical studies reveal that the debt dynamics and the fiscal outlook of the Turkish economy have been on an unstable path. As Sargent and Wallace (1981) indicate, higher fiscal deficits may create inflation even without the monetization of the deficits.

One of the prerequisites of the inflation targeting is that the central bank must have a sufficient ability to forecast inflation and to assess the effects of changes in monetary instruments on inflation. Thus, the monetary authority must rely at least in part upon leading indicators of inflation of the type investigated in this article. The present paper examined the predictive content of various economic variables for inflation. Thus, using econometric procedures, this paper has attempted to determine whether Turkey are ready to meet the requirements of inflation targeting. The empirical evidence portrayed by this article support the view that the fundamental factors behind the inflationary process in Turkey are fiscal imbalances and debt-financing of deficits. Variance decompositions based on the VAR methodology suggest that changes in public sector borrowing requirement, the interest rate, and the own shocks of inflation are major factors explaining variations in inflation. Furthermore, the empirical evidence in this paper show that monetary policy is essentially accommodative in Turkey.

In conclusion, Turkey must eliminate the fiscal roots of the inflation problem before adopting a framework akin to inflation targeting. It should be emphasized that the debt problem of Turkey can be solved mainly by relying on growth-enhancing measures. Furthermore, the governments in Turkey must recognize that social conflicts and inequality in distribution of income increase fiscal imbalances as suggested by the Political Economy literature.

NOTES

¹The output gap (OG) measures the deviation of potential output from actual output, where potential output is derived from the Hodrick-Prescott filter. The NAIRU models generally contain an equation for output gap. The NAIRU is defined as that rate of unemployment at which inflation is non-accelerating.

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