

MEASURING THE EFFECTS OF MONETARY POLICY FOR TURKEY

Hakan Berument and N. Nergiz Dincer¹

This paper proposes a specification to identify the monetary policy for a small open economy, Turkey. The monetary policy is measured by using the *spread* between the Central Bank's interbank interest rate and the depreciation rate of the domestic currency. A VAR type of model is used to identify monetary policy covering the period 1986:05-2000:10. The results suggest that tight monetary policy has a transitory effect on output but a permanent effect on prices. This specification is free of some puzzles such as the price puzzle and the liquidity puzzle that hampered some of the previous studies.

1. INTRODUCTION

Understanding what monetary policy can do to enhance economic performance (and, just as importantly, what it cannot do) is a continuing challenge for economic policymakers around the world (Mankiw, 2003). For good policy-making, it is necessary to measure how monetary policy is affected by different macroeconomic conditions and how it affects the macroeconomy. The literature contains many studies about monetary policy for both developed and developing countries but there are few empirical studies that identify a specific monetary policy and its effects (Cushman and Zha, 1997). In this paper, we use Vector Autoregressive (VAR) methodology to identify the monetary policy in Turkey --a small open economy with high and persistent inflation.

Large structural economic models were used to assess monetary policy in the studies such as Dornbusch and Giovannini (1990), Frankel (1987), and Edison and Tryon (1988). However, Sims (1980) and Cushman and Zha (1997) argued that many identifying restrictions employed in such

¹ The authors respectively are from Department of Economics, Bilkent University, Ankara, Turkey, e-mail: berument@bilkent.edu.tr and State Planning Organization, Economic Modeling Department, e-mail: ndincer@dpt.gov.tr
NB. The views presented here are those of the authors; they do not necessarily reflect the official position of the State Planning Organization, or its staff.

models were not credible; suggested using impulse responses from reduced-form vector autoregressions (VARs) for policy analyses with better predictive power. Studies using this methodology included Bernanke and Blinder (1992), Strongin (1995), and Christiano, Eichenbaum, and Evans (1994), among others.

Monetary aggregates such as the monetary base, M1 and M2 have traditionally been used to measure the stance of monetary policy; however, it is generally agreed that the growth rates of monetary aggregates vary according to a variety of non-policy influences. An alternative measurement of monetary policy is interest rates. But neither monetary aggregates nor interest rates were effective in identifying monetary policy. And most of the studies were focused on closed economies such as the US economy. For a developing economy like Turkey, which is a small open economy, there are other factors affecting the identification of monetary policy; exchange rate appears to be the first candidate.

In this study, spread is used as the measure of monetary stance; this is the extent to which interbank interest rates exceed the depreciation rate of the local currency. The central bank may cut the liquidity provided to the public by raising interest rates at a given level of depreciation or sell foreign currency at a given level of interest rate. If the central bank pegs the interest rate at or below the depreciation rate, the public may prefer to hold foreign currency rather than domestic currency. Thus, keeping the domestic interest rate above the perceived depreciation rate is the first requirement of tight monetary policy; the higher spread means tighter monetary policy. We do not suggest that the central bank control both of these instruments at the same time; but while controlling one, the CB could watch the other. The advantage of using spread to measure monetary policy is that it can still be a monetary policy measure regardless of whether the central bank uses exchange rate targeting or interest rate targeting.

This study uses monthly data for Turkey and covers the period 1986:05-2000:10. We end the study in 2000:10 because Turkey experienced a severe crisis beginning in November 2000 with resulting changes in structure. Turkey switched to an exchange rate regime that led to an increase in exchange rate volatility with its perceived risk. However the period we study has particular importance for Turkey. This is the period

after the mid 1980s when outward oriented policies were implemented, hence this period is the post liberalization era. Turkey is also a unique laboratory for analyzing the development of inflation; there was high and persistent inflation from the mid 1970s without becoming hyperinflation. Second, during this period, the central bank targeted both exchange rates and interest rates. Overall, these characteristics of the economy of Turkey will allow us to grasp the effects of monetary policy and the economic outcomes of such policy.

Most of the previous studies identifying monetary policy look at developed countries rather than developing economies, like Turkey. Moreover, most of the earlier studies proposed criteria to identify the monetary policy; however, for most of them, the price puzzle, the liquidity puzzle and the exchange rate puzzle could not be eliminated. Three abnormalities (puzzles) can be describe as follows: when a tight monetary policy is identified with positive interest rate innovations, it seems that prices increase rather than decrease – *price puzzle*; an innovation in monetary aggregates is associated with rising (rather than decreasing) interest rates – *liquidity puzzle*; a positive innovation in interest rates is associated with the impact of the depreciation of the local currency rather than its appreciation – *exchange rate puzzle*. Berument (2007) is an exception in that he proposes a specification free of puzzles to identify Turkey's monetary policy; he uses a VAR model composed of 6 variables: output, prices, commodity prices, exchange rate, spread and money. However his specification there has a couple of drawbacks. First, using 6 variables leads to over parameterized models. Second, the high correlation between prices and commodity prices, and spread and the exchange rate would lead to misleading results when used in the same specification. Third, Berument's results (2007) suggest that although prices decrease permanently when the output measure is industrial production, the decrease is temporary when other output definitions are used. The same type of differences in the response of commodity prices and exchange rates appear between the specification and different output measures. This calls into question the robustness of the specification. Our study identifies Turkey's monetary policy by proposing a specification which is free of puzzles, and which overcomes the problems of Berument's specification (2007).

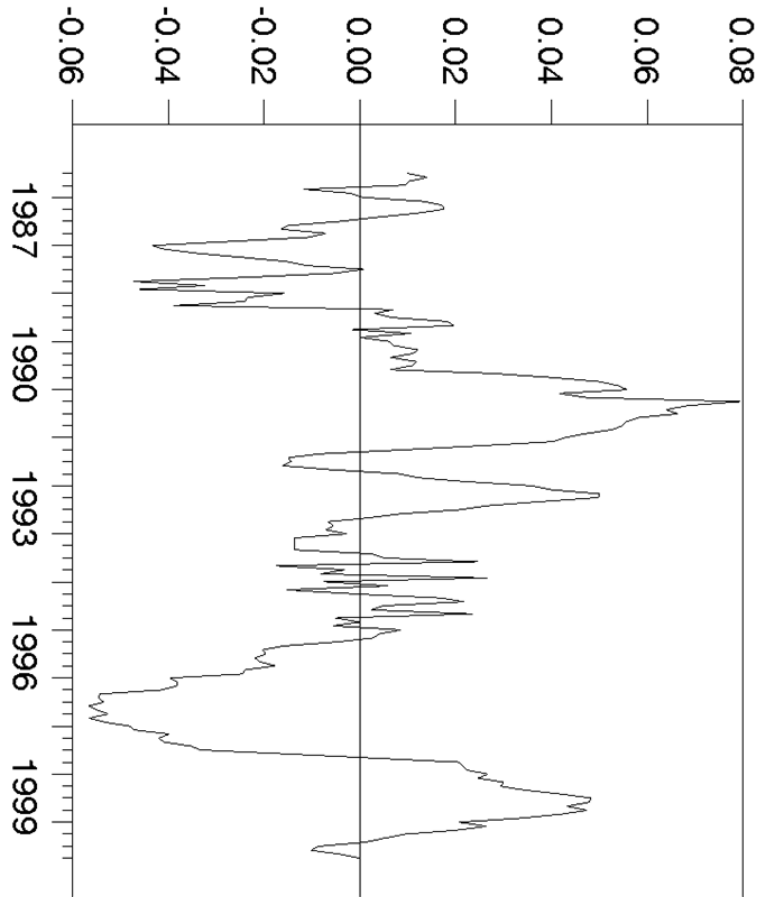
The outline of the paper is as follows: Section 2 presents the developments in monetary policy in Turkey. Section 3 discusses the model. Section 4 explains the data set. Results are discussed in Section 5. Finally, Section 6 contains conclusions.

2. DEVELOPMENTS IN MONETARY POLICY IN TURKEY

The 1980s in Turkey were years of liberalization and an economic strategy that was oriented outward. There were several stages of economic policy leading up to the capital account liberalization of 1989: determining exchange rates by the Central Bank, setting interest rates free, permitting residents to hold foreign exchange deposits, establishing the interbank money market and Istanbul Stock Exchange and starting to use indirect monetary policy instruments in policy implementation. Finally, in 1990 Turkey adopted convertibility of the Turkish lira.

Since the Central Bank was not independent during the 1980s and 1990s, the political cycles were a dominant force in determining the stance of monetary policy (see the discussions in Sayan and Berument, 1997; Ergun, 2000; Berument and Neyapti, 1999 and Berument, 2007). The 1986-1990 period was characterized by unstable political structure and frequent elections--mid-term elections in September 1986, municipal elections in June 1987, a referendum in September 1987, elections in November 1987 and another referendum in September 1988. Figure 1, which reports the cumulative sum of spread innovations shows that the stance of monetary policy followed a volatile path between tight and loose monetary policy during this period; this path parallels our identification scheme. In particular, Figure 1 reports the cumulative sum of spread innovations using a 4 variable VAR model, where the ordering is output, prices, spread and money and the lag order is 1. The model is identified using the Choleski Decomposition; therefore, the third equation of the VAR, which models the spread, is explained by the lags of the four variables and the current levels of output and price. The increases and decreases represent monetary tightening and easing.

Figure 1: Implied Stance of Monetary Policy: Accumulated Summation of Spread Innovations



1990 was the year that the central bank first announced a monetary program with a medium term horizon. The monetary program aimed at controlling the credit extended to the public sector, thus the domestic assets. This resulted in tight monetary policy for the year and the balance sheet targets of the monetary program were almost realized. Because of the uncertainties of the Gulf War, a monetary program was not announced in 1991. The increased need for public sector borrowing resulted in higher inflation despite a contraction in the economy. Monetary easing was seen within the year, because of both the Gulf War and the elections in November 1991.

The period before the elections in June 1992 was characterized by monetary easing. Following this until April 1993, tight monetary policy was observed. For 1992-1993 the Central Bank of the Republic of Turkey (CBRT) announced a new monetary program based on tight monetary policy, despite the lack of fiscal discipline. The monetary program ended with an announcement by the Prime minister that she would decrease interest rates to boost the economy. Loose monetary policy has persisted since the crisis in 1994.

The financial crisis forced the government to sign a Stand-by Agreement with the IMF. The Agreement heavily influenced the monetary policy of CBRT as the IMF urged a ceiling on net domestic assets and a floor on net international reserves. Following these policy measures, the economy recovered during 1995. Inflation declined to 65.6 per cent in 1995 from 149.6 per cent in 1994. However, the election atmosphere forced CBRT to follow an expansionary monetary policy.

During 1996-1997, the CBRT publicly announced that monetary policy implementation would be based on achieving stability in financial markets rather than decreasing the inflation rate. This period was characterized by the loose monetary policy. Following the Asian crisis in mid-1997 and a decrease in Turkey's ratings by international agencies, CBRT tightened its monetary policy. The Central Bank maintained this monetary stance until the third quarter of 1999, when the earthquake hit. The CBRT had to follow a supportive monetary policy to help economic recovery.

At the end of 1999, a new stand-by agreement with IMF based on a fixed exchange-rate regime was signed. The CBRT kept its loose monetary policy during this program, as outlined in the literature. Agenor and Montiel (1999) suggest that monetary policy is looser in an exchange rate-based stabilization program compared to a monetary-based stabilization program.

We provide a set of plots to demonstrate the relationship between the monetary policy measure proposed here and the money aggregates. Figure 2 plots the M1 plus repo (M1R) growth variables and Figure 3 plots the M2 plus repo (M2R) growth variables along with the accumulated spread innovations. Figure 2 shows that the relationship between M1R and the spread innovation is quite strong during the

sample period except for 1992 and the period between 1996 and 1999. Figure 3 suggests that the relationship is weaker for M2R growth compared to M1R growth. This relationship is also weak for 1988. These two figures suggest that even if there is a relationship between money growth measures and spread measure, these relationships are not stable.

Figure 2: Stance of Monetary Policy and M1R Growth

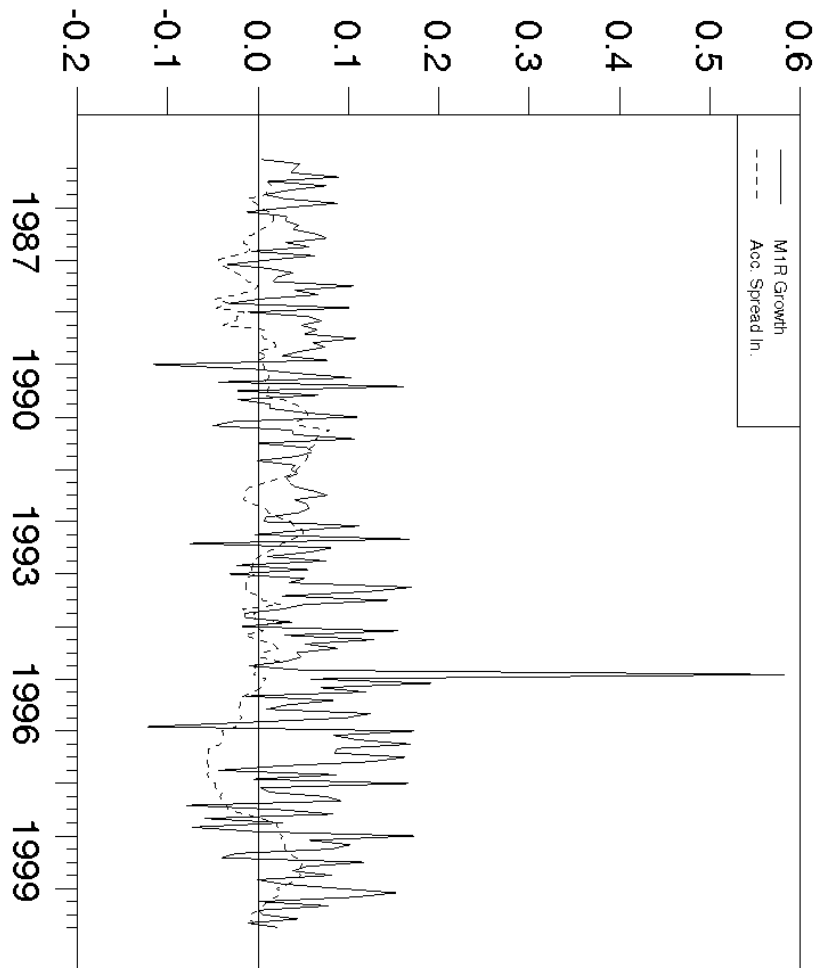
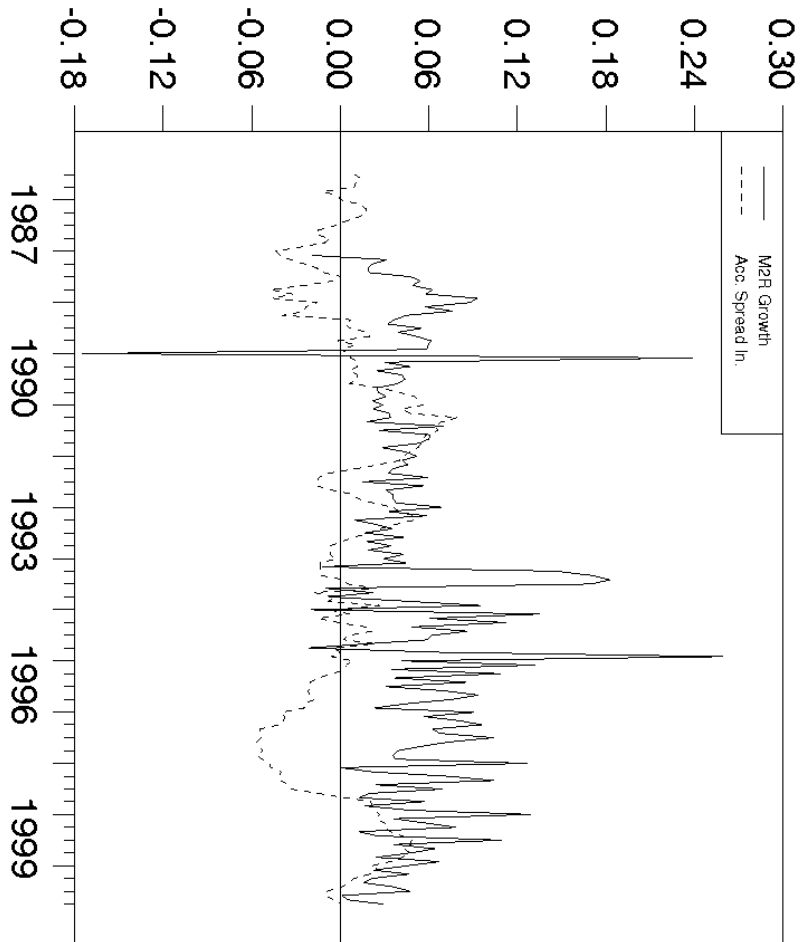


Figure 3: Stance of Monetary Policy and M2R Growth

3. DATA AND DESCRIPTIVE STATISTICS

Our paper uses monthly data covering the period 1986:05 to 2000:10. We use the following data terms: the basket is the combined TL value of 1 US Dollar plus 1.5 Deutsche Mark². Spread, is the spread between the interbank interest rate and the depreciation of the basket; p_t is the

² The choice of foreign currencies and their weights in the basket is determined by the CBRT. This is the official basket the CBRT used during the period studied.

wholesale price index is the price measure; m_t is M1+repo the money measure. The major reason for using repo transactions as our money measure is their wide use as a saving instrument during the period of this study. Repo transactions were preferred because of their liquidity; they were mainly overnight and offered a high rate of return. There were three income measures, y_t , is used at different times: industrial production, the private sector capacity utilization rate and the number of housing permits issued by local authorities³.

Our data are taken from the data delivery system of the CBRT (<http://tcmbf40.tcmb.gov.tr/cbt.html>). All data were used in their logarithmic forms except the capacity utilization rates and the spread (following Sims, Stock and Watson, 1990)⁴.

The variables used in the model are not seasonally adjusted, but the equations include seasonal dummies to account for seasonal changes. The 1994 crisis period is corrected with dummies --1 for March 1994, April 1994, and May 1994 and 0 at other times. Repo figures that are included in the money measure were not available before November, 1995; we used a dummy variable of 1 for that period.

4. MODEL SPECIFICATION

The aim of this paper is to identify the effect of the monetary policy. We used a Vector Autoregressive (VAR) model; this specification allowed us to separate the unaffected components of the central bank's policy from the state of the economy, assuming that the central bank sets its policy considering both its goals and the state of the economy. Following Christiano, Eichenbaum and Evans (1999) and Berument (2007), we followed a VAR type of specification to achieve our goal.

The VAR specification that we use in this paper includes income, y_t ; the logarithm of prices index, p_t ; the spread between the interbank interest rate and the depreciation rate, *spread*; and the logarithm of money, m_t . To identify the monetary policy of the central bank, we wanted to isolate

³ When the income measure is taken as the capacity utilization rate, the data set starts from 1991:02 and when the income measure is taken as the number of housing permits given by local authorities, then the data set starts from 1991:01.

⁴ One could argue for including the level variables in their first difference or in Vector Error Correction form. Johansen λ - trace and λ - max tests reject its null of no cointegration for the system. Thus using differenced series would lead to over differencing.

those components of the central bank that are not affected by other variables. Therefore, the ordering of the VAR specification in this study is as follows: $(y_t, p_t, spread_t, m_t)$; thus although income and prices do affect the Central Bank's policy reaction, the monetary policy setup does not have any concurrent effect on income and prices. The lag length of the VAR specification is set as two following the Hannan-Quinn and the Schwarz information criteria.

We also considered lag orders of the VAR system of 3, 6, 9 and 12. The results are robust when industrial production and housing are taken as the income measures. The only abnormality observed was the *price puzzle* – positive innovation in *spread* increased prices rather than decreasing them. This puzzle held for the VAR specifications with 6 and 9 lags and when capacity utilization was the income measure.

5. EMPIRICAL RESULTS

The VAR models supported our argument, using Turkey as a case study.

5.1. IMPULSE RESPONSE FUNCTIONS

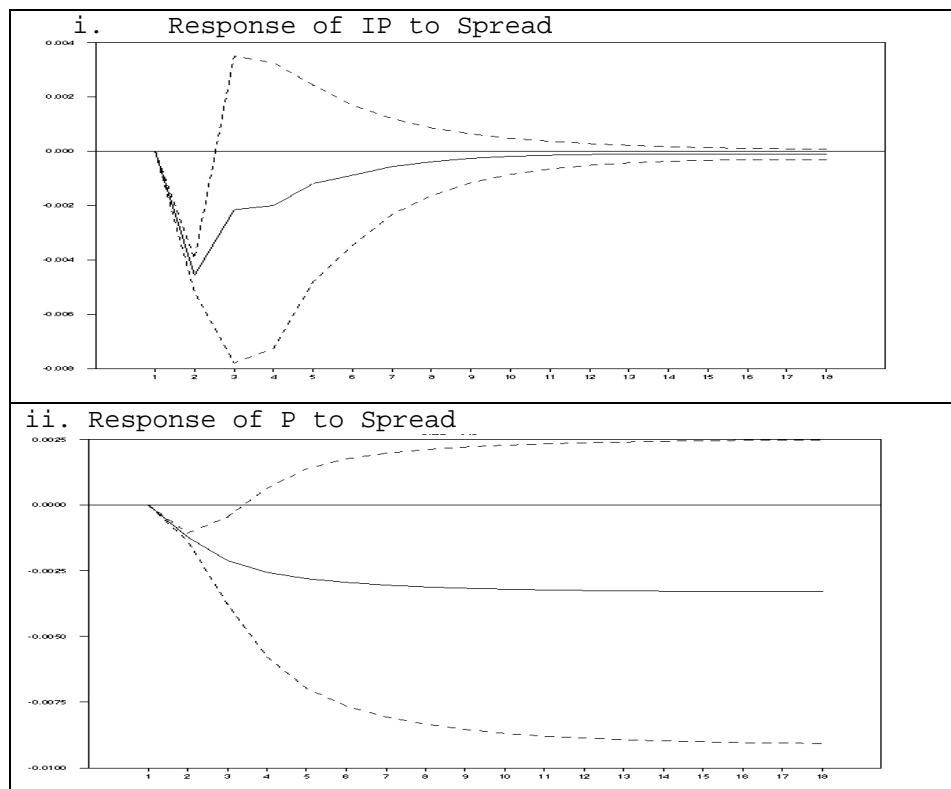
The effects of tight monetary policy - positive innovation in spread - are assessed by using impulse response function analyses; these are calculated by the Monte Carlo method of 500 draws from the estimated asymptotic distribution of the VAR specification and its covariance matrix (Masconi, 1998; Doan, 2000) using the routine called MALCOLM. The specification is in the order of industrial production, prices, spread and money. Figure 4 shows the results for 18 periods. The middle line shows the point estimates and the other two lines indicate the 95% confidence intervals.

In the first diagram, the effect on output of a positive innovation in *spread* is transient; it decreases for two months in a statistically significant fashion and then regains its initial level. In other words, tight monetary policy is associated with a drop in industrial production and follows a hump-shaped pattern, which is consistent with Berument (2007) and the Fuhrer and Moore model (Fuhrer and Moore, 1995a; and Fuhrer and Moore, 1995b) as presented in Walsh (1998: 472-4). The intuition behind this is that when monetary policy is exogenous, inflationary pressure, excess liquidity demand and shocks from the rest

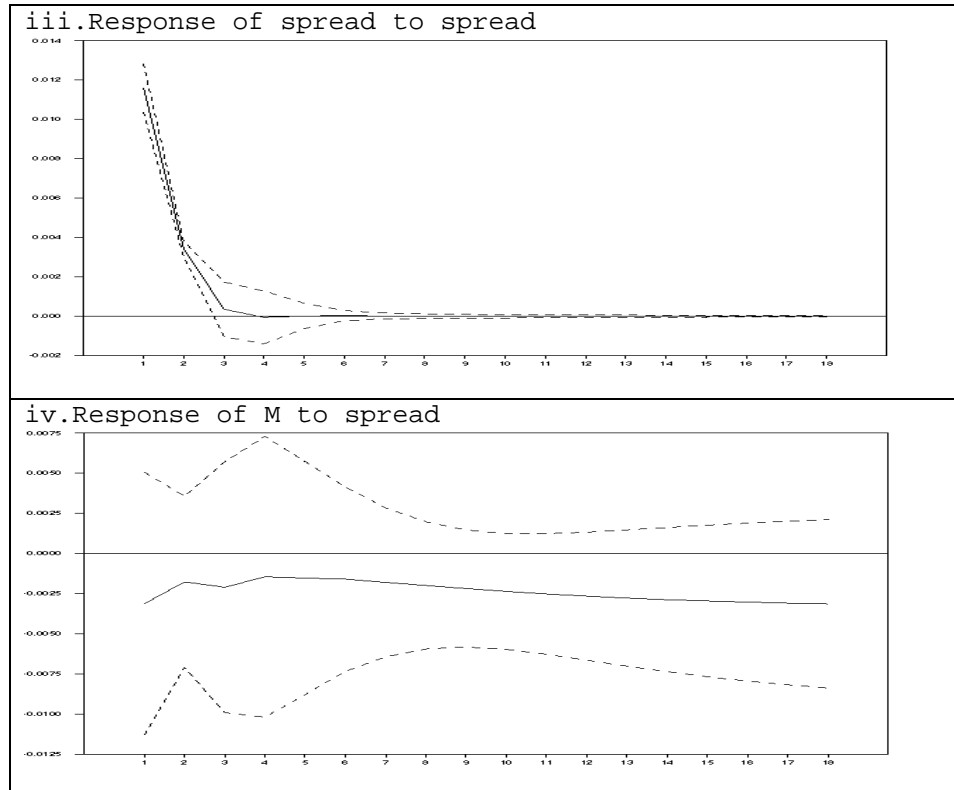
of the world do not affect it. Therefore, output level and prices do not increase, as our specification suggests.

Likewise, the second diagram suggests that price level decreases for three months in a statistically significant fashion. There may be more than one theoretical reason for this outcome, such as lack of persistence of the monetary policy of CBRT, and the validity of uncovered interest rate parity for a given level of foreign interest rate. The third diagram in the figure shows the movement of *spread* when there is one standard deviation innovation in the *spread*. The innovation in *spread* persists only for three months and then disappears. Finally, the fourth diagram shows that money decreases with a positive innovation in *spread*. However, the effect of monetary tightening on money is not statistically significant.

Figure 4. Effects of Spread when industrial production is used as the definition of output

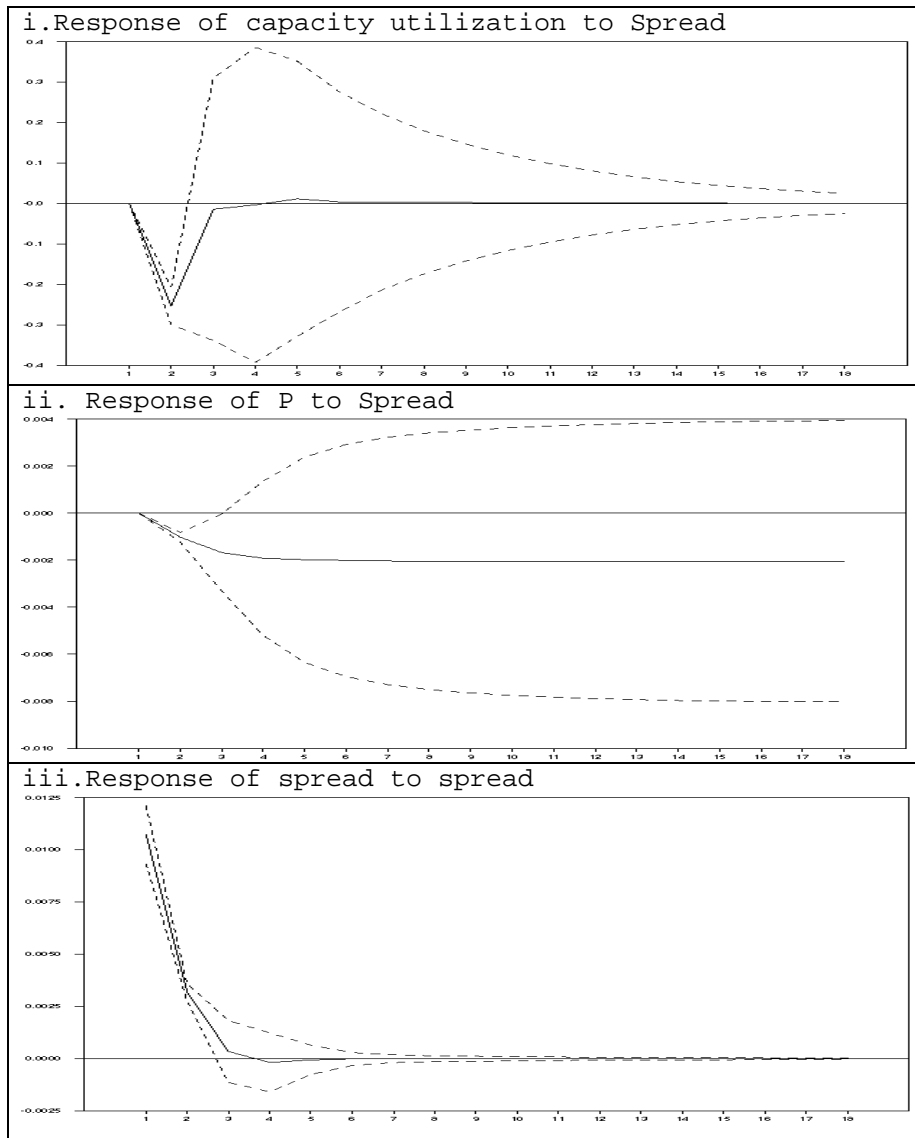


Cont.



For robustness, we used alternative definitions of the variables in our specification. In Figure 5 the capacity utilization rate of the private sector is used for income and the results obtained from the impulse response analysis are consistent. Finally, in Figure 6 the output definition is housing permits as a measure of income. The results are similar to the results for the other two definitions. Therefore, our specification is considered robust for various definitions of output.

Figure 5. Effects of Spread when capacity utilization is used as the definition of output



Cont.

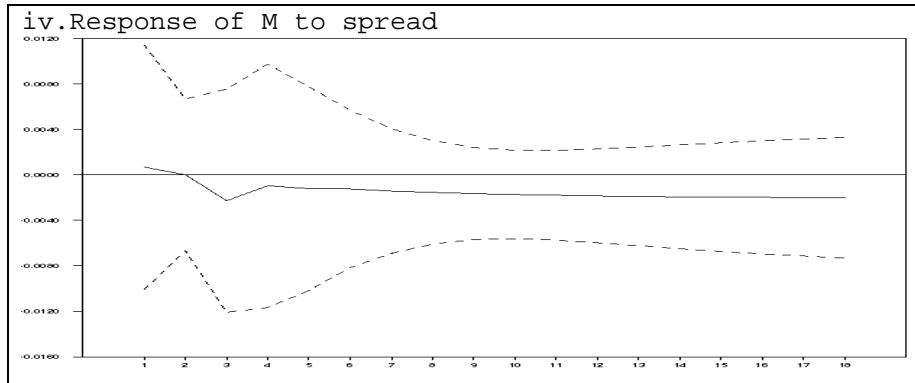
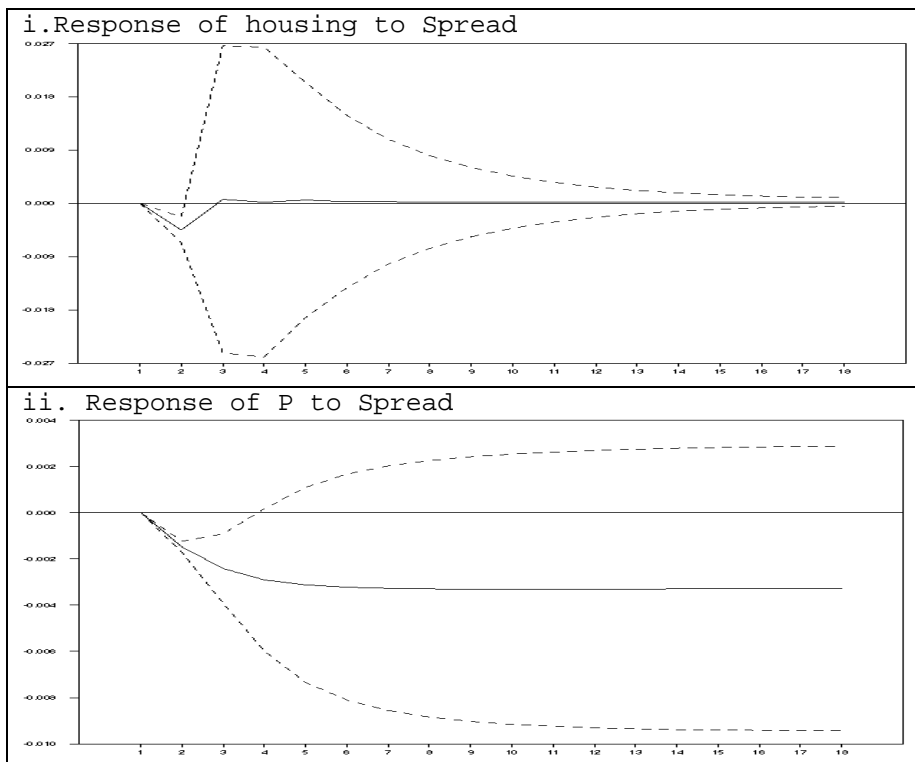
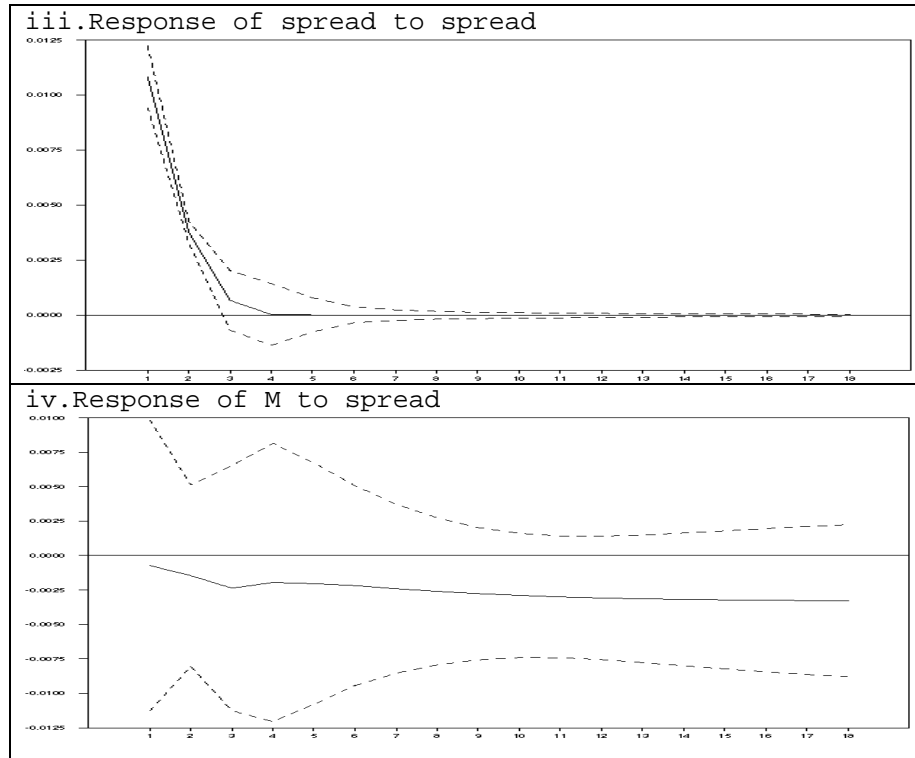


Figure 6. Effects of Spread when housing is used as the definition of output



Cont.



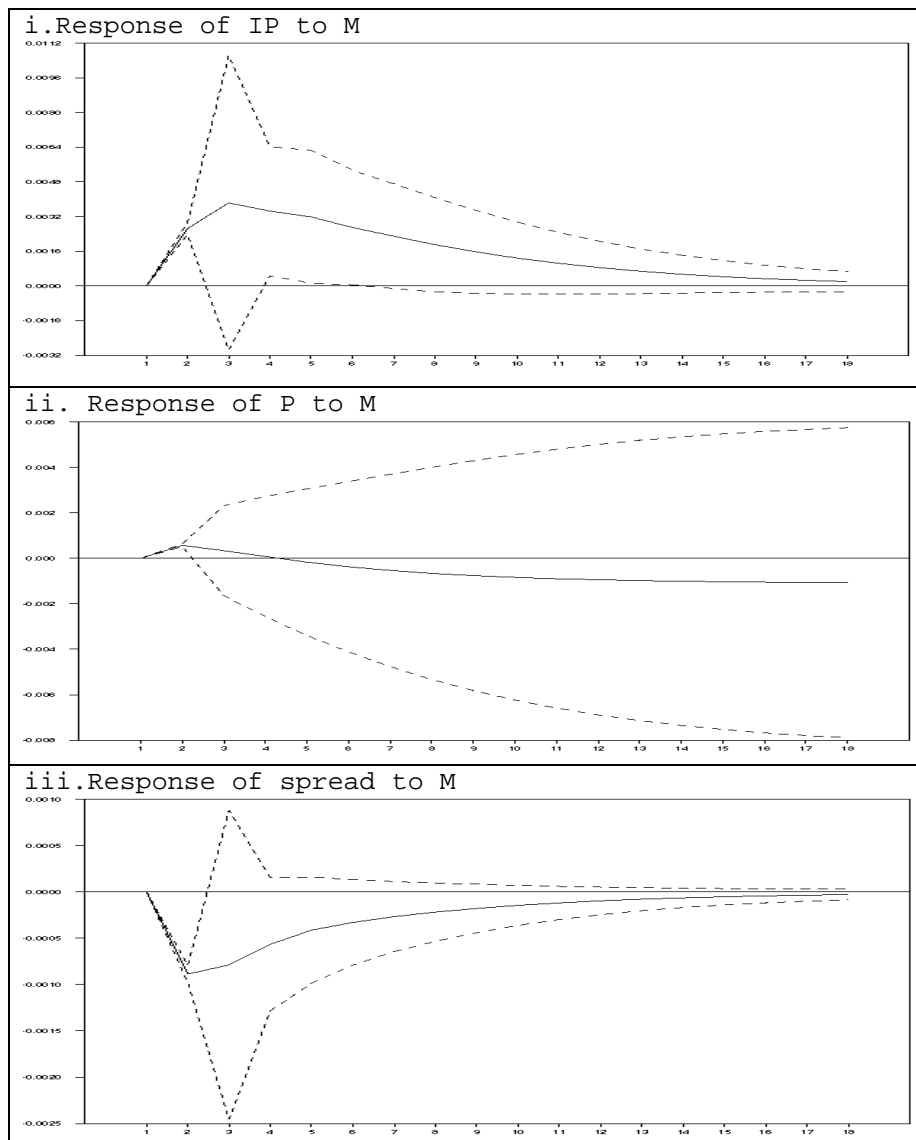
Next, we used M2 plus Repo (M2R); this is a broader measure of money than M1 plus Repo. The results are consistent. To be precise, a positive innovation in *spread* increases M2R rather than decreases it. Moreover, an increase in M2R decreases prices rather than increasing them⁵.

In addition, we tried an alternative variable for measuring monetary policy; we will discuss the effects of a positive innovation in the monetary aggregate. It is common to identify the monetary policy by using money aggregate (see for example Barro, 1977 and Mishkin, 1983). The effect of a one standard deviation in m is presented in Figure 7 when industrial production is used as the output definition. Monetary tightening introduces a statistically significant increase in output for 2 months as shown in the first diagram of Figure 7. Price increases and spread decreases can be followed from diagrams 2 and 3. Figure 8 and 9 show the responses of the variables to a positive innovation in m , with different definitions of output similar to our base case. The results are

⁵ The results are not reported here, but available from the authors upon request.

similar to what we obtained when spread was used to identify monetary policy.

Figure 7. Effects of Money when industrial Production is used as the definition of output



Cont.

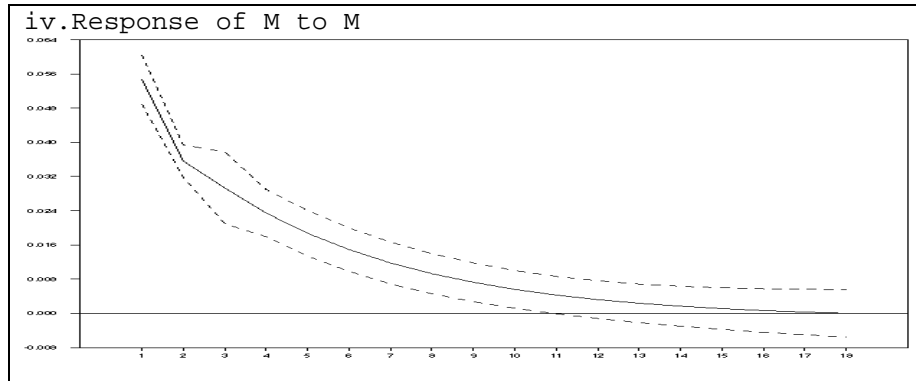
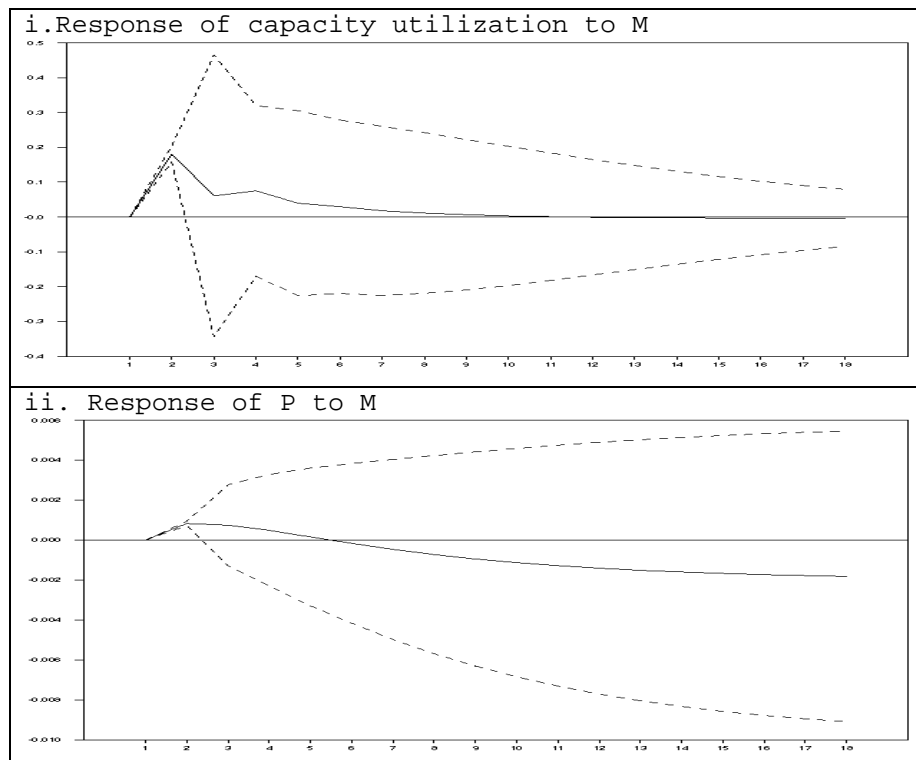


Figure 8. Effects of Money when capacity utilization is used as the definition of output



Cont.

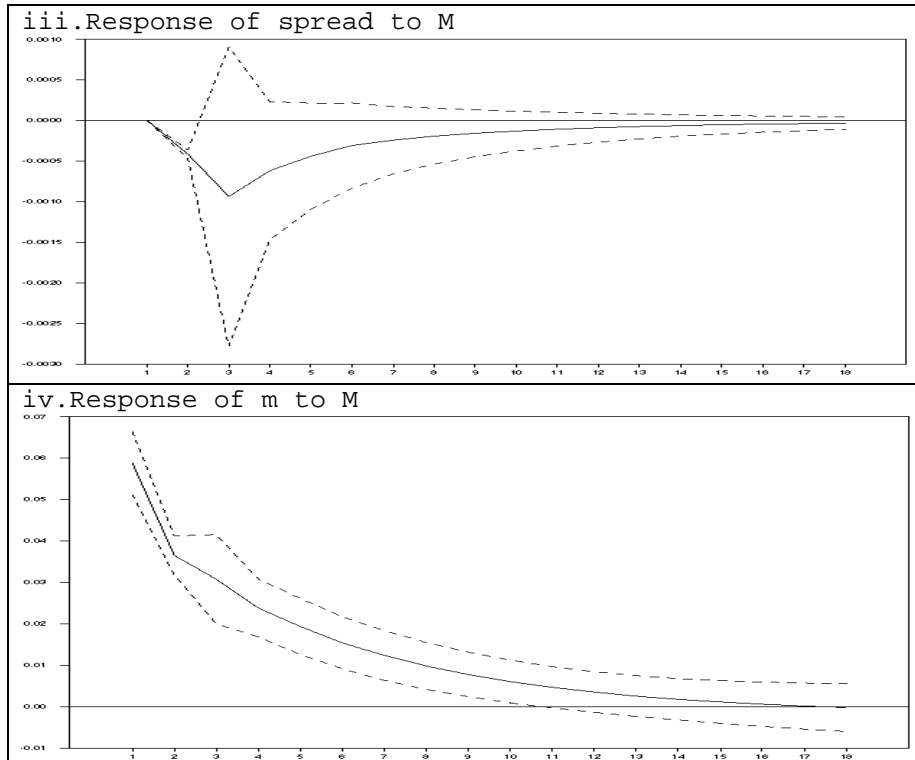
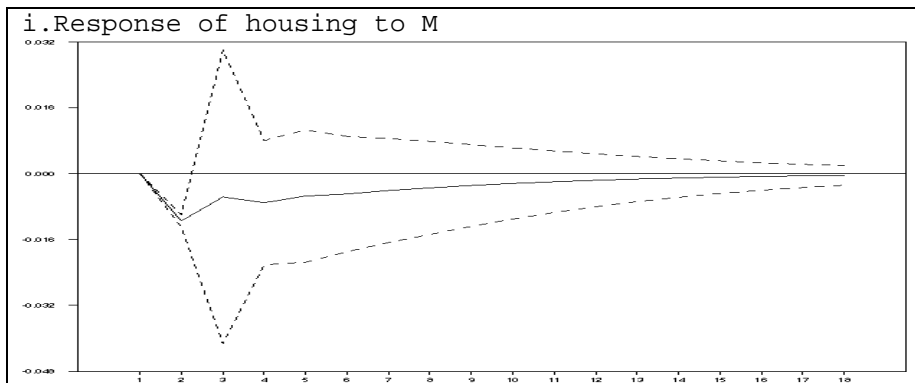
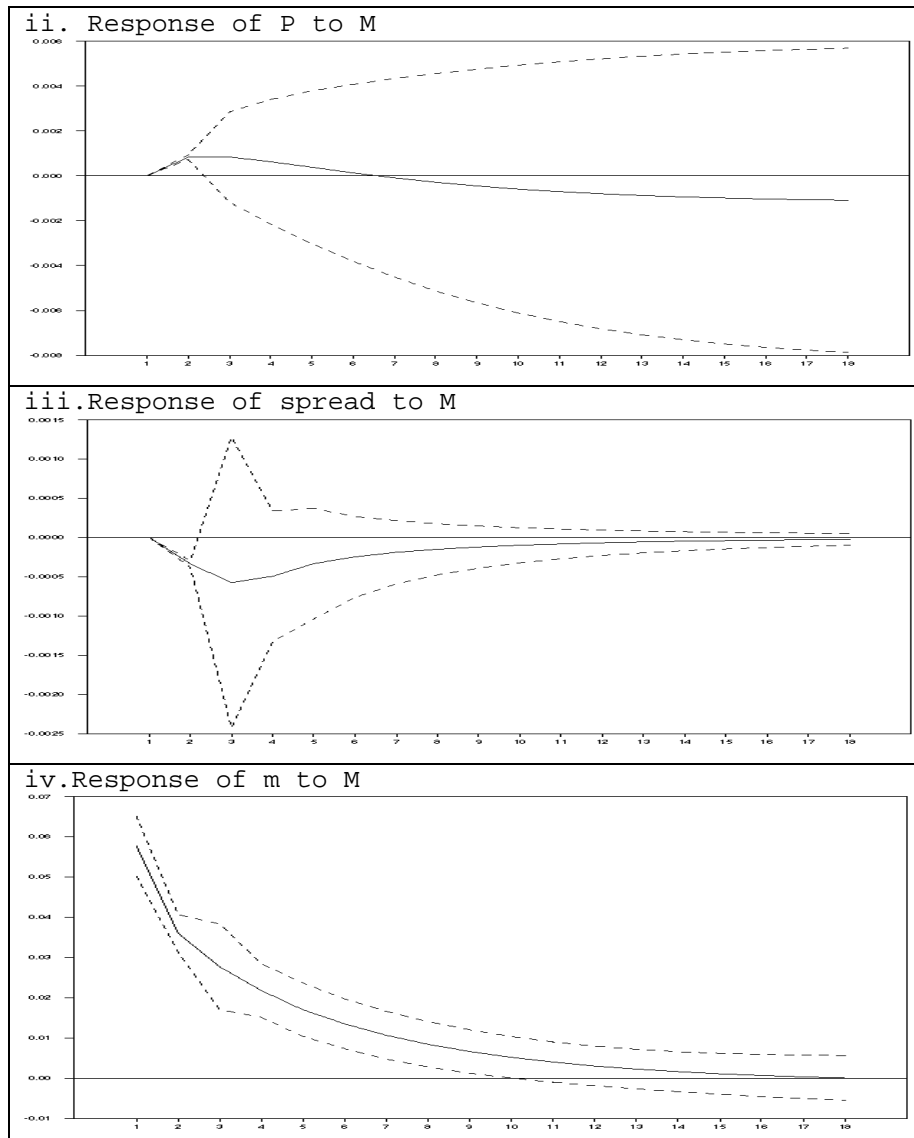


Figure 9. Effects of Money when Housing is used as the definition of output



Cont.



To further analyze robustness, we performed the analysis in a restricted period, 1994:08 to 2000:10. We did this because some studies suggest (Ozatay, 2000; Alper and Onis, 2001; and Ertugrul and Selcuk, 2002) that the 1994 financial crisis in Turkey changed the structure and behavior of financial markets. Our results suggest that when monetary policy is identified by *spread*, output decreases with monetary tightening. Conversely, prices decrease with a positive innovation in *spread*, but the decrease is not statistically significant. The sub-period

estimations are repeated with different output definitions. Although the results are robust for two definitions of output, the outcome of the housing variable is not robust. In other words, output increases in a statistically significant fashion in the sub periods when the housing variable used to define output. In conclusion, the sub-period impulse-response function analysis is robust for two definitions of output--industrial production and capacity utilization rate--but monetary tightening results in an increase in output when it is measured by the housing variable.

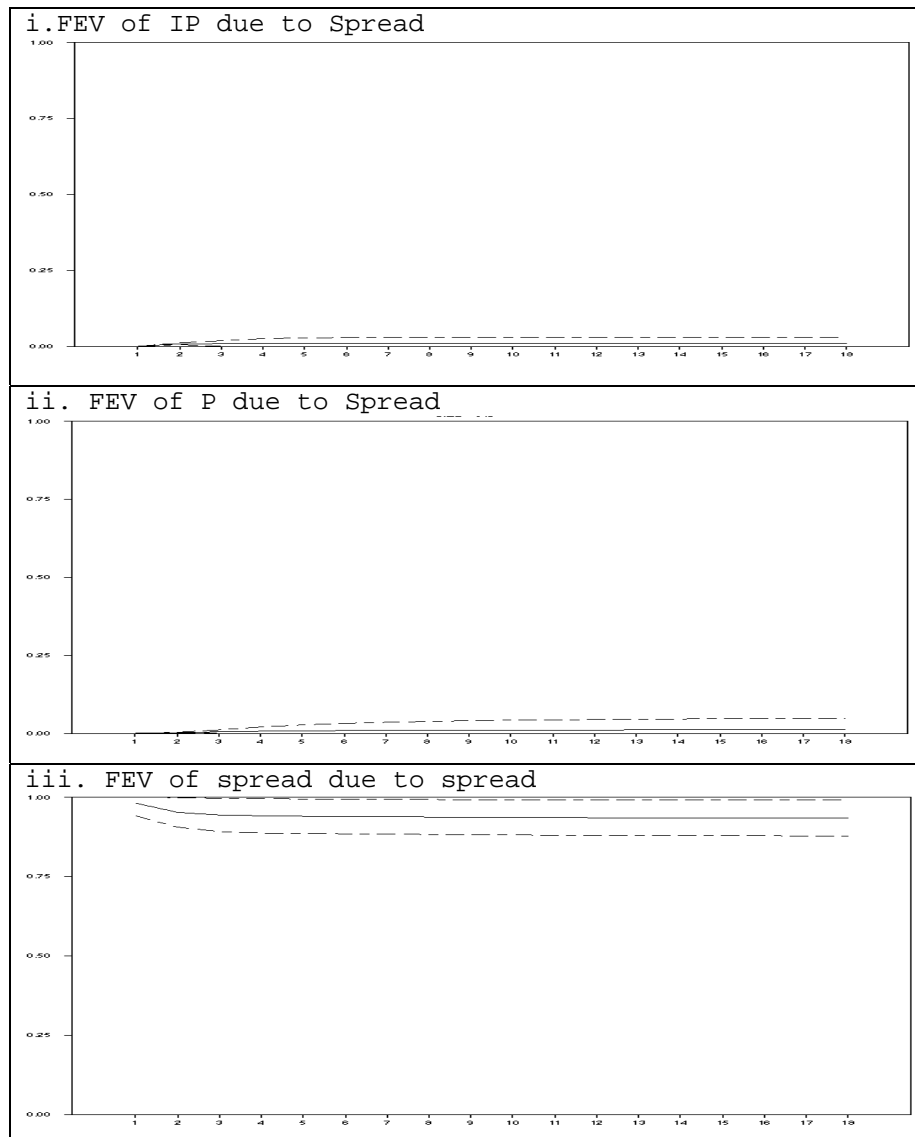
The analyses are also repeated for different sub-periods--1986:05-1997:12 and 1998:01- 2000:10. The results are similar in the first sub period. However, for 1998:01- 2000:10, the results are not consistent with the base case. This could perhaps be explained by the shortness of the period.

Finally, we reordered the variables in the VAR setting, making spread the last variable: the extreme information assumption --central bank knows income and prices before setting up spread. The results suggest that our analysis is robust in re-ordering the variables in the VAR setting..

5.2. FORECAST ERROR VARIANCE DECOMPOSITION

Figures 10-12 contain forecast error variance decompositions that analyze the contribution of monetary policy volatility to the volatility of output, prices and money. Figure 10 reports the percentage of the variance of industrial production, prices, spread and money that are explained by the variability of spread for the first 18-day ahead forecast error variance decompositions. Figures 11 and 12 repeat the same analyses for the other two definitions of income.

Figure 10. Forecast Error Variance Decomposition of Spread when industrial production is used as the definition of output



Cont.

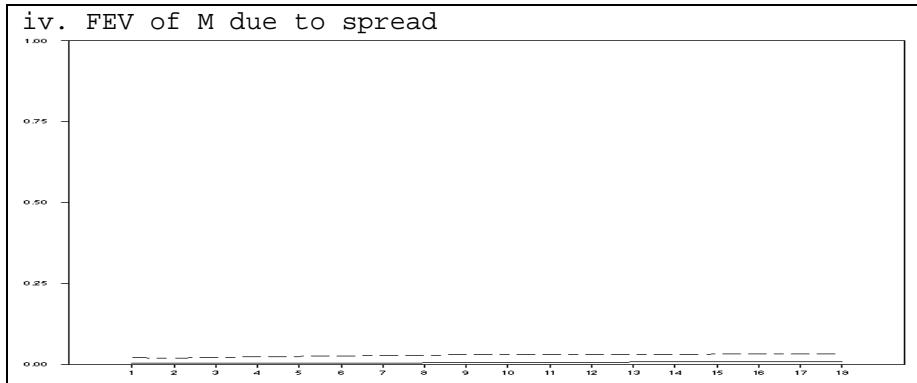
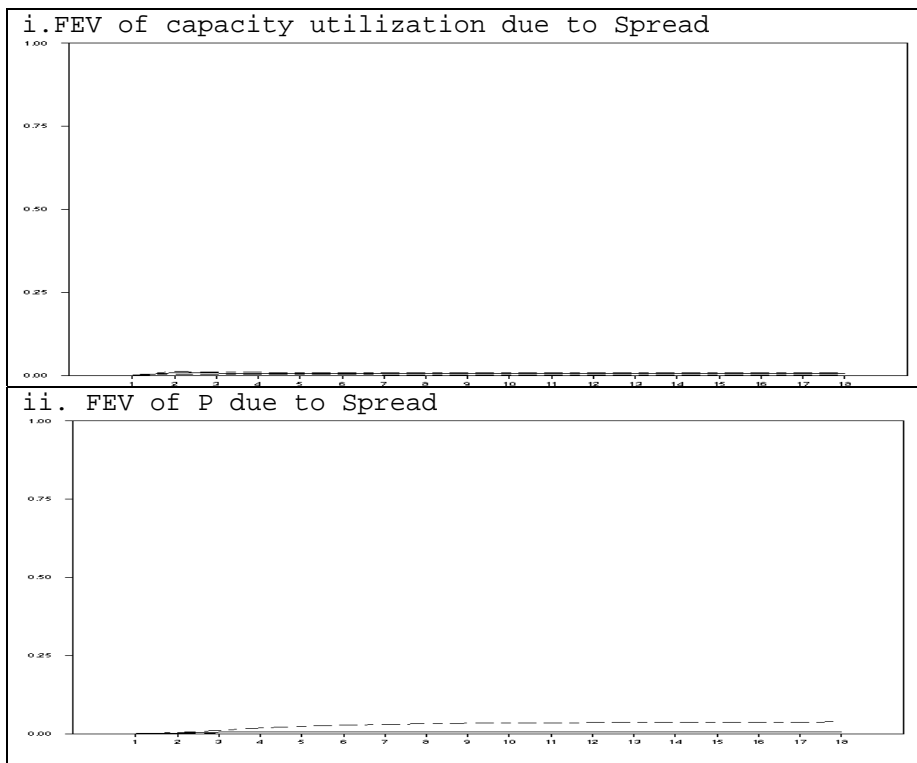


Figure 11. Forecast Error Variance Decomposition of Spread when capacity utilization is used as the definition of output



Cont.

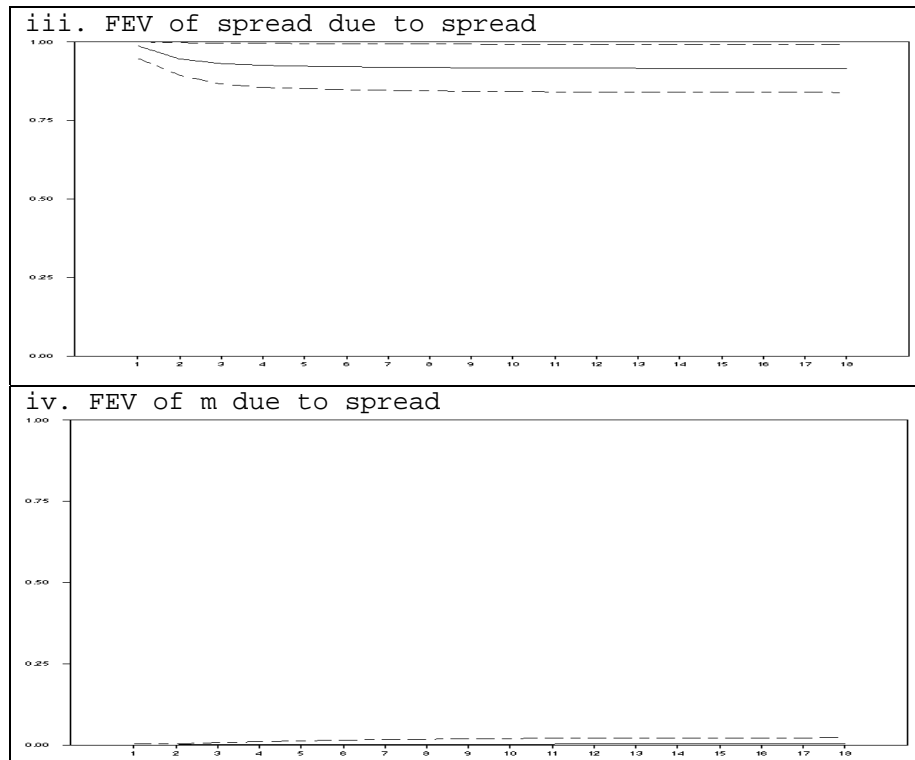
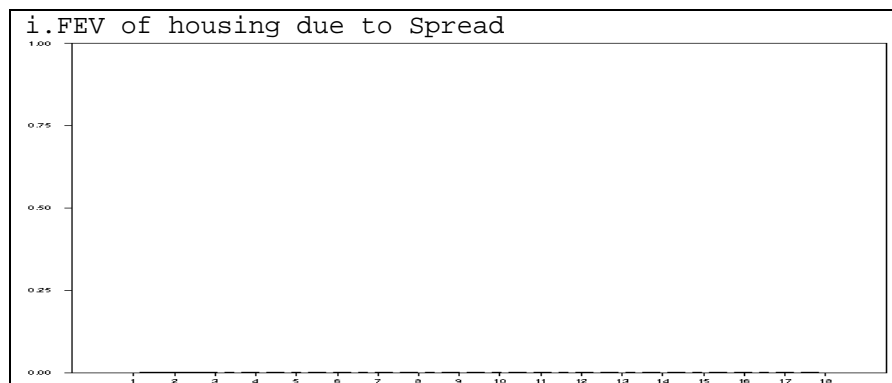
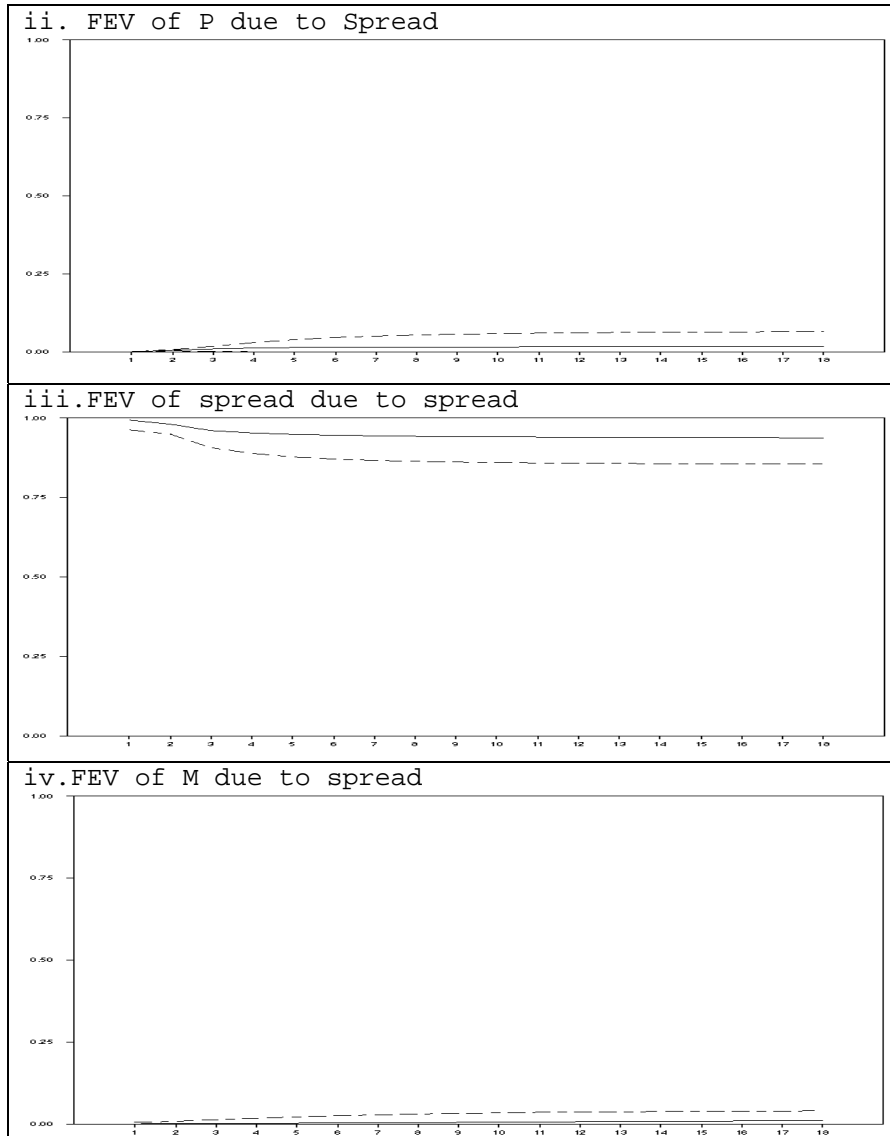


Figure 12. Forecast Error Variance Decomposition of Spread when housing is used as the definition of output



Cont.



These three figures suggest that the variability of spread in output and prices is not statistically significant; monetary policy variability does not explain the variance of output and prices. This is unexpected but parallels the findings of Kim (1999) and Kim and Roubini (2000). On the other hand, the most of the variation of spread is also explained by itself. This result supports our claim that spread is exogenous and not explained by either income or prices.

5.3. DISCUSSION

This paper aims to identify the monetary policy using the VAR methodology. In the literature, the identification of monetary policy using VAR has been associated with the liquidity puzzle and the price puzzle. The liquidity puzzle is the theoretically unexpected positive relationship between money aggregates and interest rates (Leeper and Gordon, 1992); the price puzzle is the price increase that is seen when interest rates are used as the monetary policy measure. Many studies have tried to solve these puzzles by using different identification schemes and variables. We used spread as the monetary policy measure, eliminating the price puzzle⁶. Moreover, the empirical evidence provided here on the effect of spread innovations on prices and income are stronger than evidence provided by Berument (2007).

6. CONCLUSION

Identifying monetary policy is necessary for good policy-making but it is not easy. Most of the research has focused on the US and other developed countries. This paper proposes a specification to identify monetary policy for a small open economy— Turkey. A similar specification could be used for other developing countries.

The *spread* between the Central Bank's interbank interest rate and the depreciation rate of the domestic currency is taken as the measurement of monetary policy. The results suggest that tight monetary policy has a *transient* effect on output, causing output to decline for three months in a statistically significant fashion; the decrease in prices is also temporary. Thus it is not advisable to use monetary policy to stimulate the economy consistently but monetary policy could be a tool to hamper the volatility of business cycles. The results are consistent with previous studies (Sims, 1992; Eichenbaum and Evans, 1995; Grilli and Roubini, 1995; Kim and Roubini, 2000; Berument, 2007). The puzzles such as price puzzle and the liquidity puzzles that some of the previous studies faced are eliminated. This further supports the validity of our specification.

⁶ For further discussion on the puzzles and their elimination see Berument (2007).

REFERENCES

Agenor, Pierre-Richard and Peter Montiel, 1999, *Development Macroeconomics, Second Edition*, Princeton, NJ: Princeton University Press.

Alper, Emre and Ziya Onis, 2003, Financial Globalization, the Democratic Deficit and Recurrent Crises in Emerging Markets: The Turkish Experience in the Aftermath of Capital Account Liberalization, *Emerging Markets Finance and Trade*, 39(3), 5-26.

Barro, Robert J., 1977, Unanticipated Money Growth and Unemployment in the United States, *American Economic Review*, 67(2), 101-115.

Bernanke, Ben and Alan Blinder, 1992, Federal Funds Rate and the Channels of Monetary Transmission, *American Economic Review*, 82(4), 901-921.

Berument, Hakan, 2007, Measuring Monetary Policy for a Small Open Economy: Turkey, *Journal of Macroeconomics*, 29(2), 411-430.

Berument, Hakan and Bilin Neyapti, 1999, How Independent is the Central Bank of the Republic of Turkey (in Turkish), *Iktisat, Isletme ve Finans*, 11-17.

Christiano, Lawrence, Martin Eichenbaum, and Charles L. Evans, (1994), The Effects of Monetary Policy Shocks: Some Evidence from the Flow of Funds, *NBER Working Paper*, 84699.

_____, _____, and _____, 1999 Monetary Policy Shocks: What Have We Learned and to What End? in John B. Taylor and Michael Woodford, eds., *Handbook of Macroeconomics Volume 1A*, Amsterdam/Netherlands: Elsevier Science, pp. 65-148.

Cushman, David O. and Tao Zha, 1997, Identifying Monetary Policy in a Small Open Economy under Flexible Exchange Rates, *Journal of Monetary Economics*, 39, 433-448.

Doan, Thomas A., 2000, *RATS Version 5*, Cambridge, MA: Estima.

Dornbusch, R. and A. Giovannini, 1990, Monetary Policy in the Open Economy in B.M. Friedman and F.H. Hahn, eds., *Handbook of Monetary Economics Volume II*, Elsevier Science, 1231-1303.

Edison, H.J. and R.W. Tryon, 1988, An Empirical Analysis of Policy Coordination in the United States, Japan and Europe in H. Motamen eds., *Economic Modeling in the OECD Countries*, London and New York: Routledge, 53-70.

Ergun, Mine, 2000, Electoral Political Business Cycles in Turkey, *Russian and East European Finance and Trade Journal*, 36(6), 6-32.

Ertugrul, Ahmet and Faruk Selcuk, 2002, Turkish Economy: 1980-2001, in Aykut Kibritcioglu, Libby Rittenberg, and Faruk Selcuk, eds., *Inflation and Disinflation in Turkey*, Hampshire, England: Ashgate, pp. 13-40.

Frankel, J., 1987, The Sources of Disagreement Among International Macro Models and Implications for Policy Coordination, *processed*, University of California, Berkeley.

Fuhrer, J.C. and G.R. Moore, 1995a, Inflation Persistence, *Quarterly Journal of Economics*, 110(1), 127-159.

_____, and _____, 1995b, Monetary Policy Trade-offs and the Correlation Between Nominal Interest Rates and Real Output, *American Economic Review*, 85(1), 219-239.

Kim, S., 1999. Do monetary policy shocks matter in the G-7 countries? Using common identifying assumptions about monetary policy across countries, *Journal of International Economics*, 48, 387-412.

Kim, S., Roubini, N., 2000. Exchange rate anomalies in industrial countries: A solution with a structural VAR approach, *Journal of Monetary Economics*, 45, 561-586

Leeper, Eric M. and David B. Gordon, 1992, In Search of the Liquidity Effect, *Journal of Monetary Economics*, 29(3), 341-369.

Mankiw, Gregory, 2003, *Principles of Economics*, South Western Publications.

Mishkin, F.S., 1983, *A Rational Expectation Approach to Testing Macroeconomics: Testing Policy Ineffectiveness and Efficient-Market Models*, Chicago, IL: University of Chicago Press.

Mosconi, Rocco., 1998, MALCOLM (MAximum Likelihood COintegration analysis of Linear Models, Venezia, Italy: Cafoscarina.

Ozatay, Fatih, 2000, The 1994 Currency Crisis in Turkey, *Journal of Policy Reform*, 3(4), 327-352.

Sayan, Serdar and Hakan Berument, 1997, Politics in Turkey, Economic Populism and Governments (in Turkish), *H.U. İktisadi ve İdari Bilimler Fakültesi Dergisi*, 1997, 15(2), 171-185.

Sims, Christopher, "Comparison of Interwar and Postwar Business Cycles: Monetarism Reconsidered," *American Economic Review Papers and Proceedings*, 1980, 70, 250-257.

Sims, Christopher, James H. Stock, and Mark W. Watson, 1990, Inference in Linear Time Series Models with Some Unit Roots, *Econometrica*, 58(1), 113-144.

Strongin, Steven, 1995, The Identification of Monetary Policy Disturbances Explaining the Liquidity Puzzle, *Journal of Monetary Economics*, 35, 463-497.

Walsh, Carl E., *Monetary Theory and Policy*, Armonk, NY: MIT Press, 1998.