How effective is the monetary policy?

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Abstract

Purpose – The purpose of this paper is to provide logical and empirical explanations as to why monetary policy is ineffective with respect to affecting mortgage rates, and thus investment and aggregate demand.

Design/methodology/approach – Logical and empirical evidence is provided in support of the hypothesis that changes in the money supply have no significant impact on interest rates in general, and particularly on mortgage rates. This empirical analysis is based on a simple regression of changes in mortgage rates on changes in the money supply, and covers the 1990-2004 period.

Findings – Support was found for our hypothesis that changes in money supply have no significant impact on interest rates.

Research limitations/implications – The conclusion of this paper should be incorporated in all macroeconomics textbooks. Lack of such analyses may leave a confusing or misleading impression about economic theories in the mind of economics students.

Practical implications – One should not rely on monetary policy as an effective tool of stabilization policy.

Originality/value – The message of this paper is to readers of macroeconomics textbooks. This paper has an original value in that it communicates to readers that most macroeconomic textbooks fail to provide detailed and clear explanations as to why very frequently monetary policy does not achieve its objective of stabilizing the economy.

Keywords Monetary policy, Macroeconomics, Money supply, Interest rates

Paper type Research paper

Introduction

In all macroeconomics textbooks, monetary policy is introduced to students as one of the two major stabilization policies to control unemployment and inflation. Although these textbooks mention particular conditions under which monetary policy can be effective, most fail to provide detailed and clear explanations as to why very frequently monetary policy does not achieve its objective of stabilizing the economy. Economics professors are frequently asked by their students to provide real world examples of the effectiveness of monetary policy. In this paper, we provide an easy to follow (for economics students) discussion and empirical analysis of a major drawback of monetary policy. Our discussion is focused on the failure of expansionary monetary policy to cause lower mortgage rates. We know that household expenditures on new homes are a major component of investment and aggregate demand. Such expenditures are also dependent on mortgage rates. If increases of money supply fail to lower mortgage rates, they may very well fail to encourage investment and thus aggregate demand. In this paper, we provide logical and empirical analyses in support of the hypothesis that expansion of money supply does not lead to lower mortgage rates, and that monetary policy is an ineffective tool for stimulating investment and aggregate demand. We believe analyses such as the ones presented in this paper should be incorporated in all macroeconomics textbooks. Lack of such analyses may leave a confusing or misleading impression about economic theories in the mind of economics students.

Our empirical analysis is based on a simple regression of changes in mortgage rates on changes in the money supply, and covers the 1990-2004 period. Monthly data for

15-year and 30-year mortgage rates are used to measure mortgage rates, and monthly data for M1 and M2 measure money supply.

Background

The fundamental objective of monetary policy is to assist the economy in achieving a full-employment, non-inflationary level of total output. More specifically, monetary policy entails increasing the money supply during a recession to stimulate spending and, conversely, restricting the money supply during inflation to constrain spending. The process of expansionary monetary policy consists of the following chain of reactions.

- Excess reserve: by invoking certain control techniques, the Federal Reserve System can influence the size of both actual and required reserves, and therefore the excess reserves of commercial banks.

- Money supply: because excess reserves are the basis upon which commercial banks can expand the money supply by lending, any manipulations of excess reserves through the control techniques of the FED will affect the supply of money, that is, the amount which commercial banks will be able and willing to lend at various possible interest rates.

- Interest rate: given the negative slope of demand for money curve, changes in the supply of money will affect the cost and availability of money. That is, changes in the supply of money will affect the interest rate and the amount of credit bankers are willing to make available to borrowers.

- Aggregate demand and employment: changes in the cost and availability of bank credit will in turn have an impact on the spending decisions of society, particularly on investment, and therefore on the level of output and employment.

The ineffectiveness of monetary policy is based on uncertainties associated with inverse causal relations from money supply to interest rates, and from interest rates to investment. If in the hypothesized process of monetary policy, increases in money supply do not lead to lower interest rates and thus larger amounts of investment, then monetary policy will become an effective stabilization policy. In the following sections, we provide logical and empirical evidence in support of the unreliability of the relation from money supply to interest rates.

Money supply and interest rates

There are two major views of the relationship between money supply and interest rates. According to the short-term liquidity effect, money supply and interest rates are negatively correlated. According to this view, an increase in supply of money creates an excess supply of money at existing income, interest rate and price level. Money demand is a decreasing function of nominal interest rates because the interest rate is the opportunity cost of holding cash. So an increase in the supply of money must cause interest rates to decrease in order to keep the money market in equilibrium. In technical terms, assuming no shift in the money demand curve, a rightward shift in the money supply curve will cause a downward movement on the money demand curve, causing equilibrium interest rate to decline. However, even in the short-run, if at the same time that money supply shifts to the right, money demand curve also shifts to the right, the new equilibrium interest rate may be the same or higher than the old equilibrium rate. Money demand may shift to the right as the result of higher price level or higher real

output. If for example the economy experiences a stagflation, rising prices may cause the household to increase their demand for money, and thus cause a rightward shift in the money demand curve. In such a scenario, an expansionary monetary policy may become quite ineffective; since increases in money supply may result in increases (or no change) in interest rates.

Another view of the relationship between money supply and interest rates is based on the real output and price effect in the long-run. As the result of expansionary monetary policy, real output and price level may rise, causing rightward shifts in the money demand, and thus leading to higher interest rates. This positive relation between money supply and interest rates are also implied in Fisher equation. According to Fisher equation, the nominal interest rate equals the real interest rate plus the expected rate of inflation. Since the public expects expansionary monetary policy to be inflationary, increase in money supply may cause expected inflation and therefore nominal interest rates to increase.

These two views provide conflicting answers to the question of effectiveness of monetary policy. One view implies that money supply and interest rates move in the opposite direction; the other implies that they move in the same direction. The empirical evidence to date has been inconclusive as to the effect of money supply on the rate of interest. Mishkin (1981, 1982) found no liquidity effect on quarterly data prior to 1979. Melvin (1983) found results that predict liquidity effect lasting 2 months or less followed by long income and expectation effect. He concludes that the relationship between money supply and interest rates depends on the inflationary environment. The higher the inflation in a particular period, the shorter is the liquidity effect, and consequently, the faster the expectation effect. Graham (1986) finds that the variance of inflation explains the relationship between money supply and interest rates better than the inflation does. Hamlen *et al.* (1988) find no liquidity effect. Cochrane (1989) finds a negative relationship between money growth rate and interest rate which supports the presence of a liquidity effect. Reichenstein (1987), Sims (1992), Leeper and Gordon (1992) all find little or no evidence to support the presence of a liquidity effect. However, two studies by Christiano and Eichenbaum (1992) and Grier and Perry (1993) find significant liquidity effects.

Empirical analysis
Our hypothesis is that expansionary monetary policy is not an effective tool for stimulating investment and aggregate demand. We argue that a major objective of an expansionary monetary policy to encourage household investment on new homes will not be met since such a policy does not lead to lower mortgage rates. Our empirical analysis is therefore focused on the relationship between money supply and mortgage rates. We empirically illustrate that increases in money supply have not been associated with lower mortgage rates in the US. To perform our empirical analysis, we use a multiple regression model in which the dependent variable is percentage change in the mortgage rate, and the independent variables include percentage change in money supply and consumers' expectations about the state of the economy. There are two reasons why we chose consumers' expectations as one of the independent variables. First, it captures the overall state of the macro economy better than single variables such as inflation rate, short and long term interest rates, or slope of the term structure. Second, use of these variables would most probably cause multi-collinearity problem in our multiple regression model. To measure money supply, seasonally adjusted data for the narrowly defined money stock (M1) and seasonally adjusted data for M2 were used.

Monthly data for these variables were obtained from Federal Reserve data set (www.federalreserve.govt). Consumers' expectations are measured by the consumers' sentiment index whose data were obtained from www.econstats.com. The mortgage rate is measured by both the 15-year and 30-year rates. Monthly data for mortgage rates were obtained from National Average Monthly Rates; www.mortgage-x.com. Our sample covers January 1990 through April 2004. The regression model is as follows:

$$\log I_t = a + b_1 \log M_{t-i} + b_2 \log C_{t-i} + E_t \tag{1}$$

where I_t, level of the mortgage rate at time t; b_1, slope of the money supply/mortgage rate relationship; b_2, slope of the consumers' expectations/mortgage rate relationship; M_{t-i}, level of money supply at period $t-i$; C_{t-i}, level of consumers' sentiment at period $t-i$; a, intercept; and E_t, error term at time t

To capture the short-term as well as long-term effects of growth of money supply on mortgage rates, the tests were carried out to 1 through 8 lags ($i = 1$-8). Table I presents the estimates for the slope coefficients of both 15-year and 30-year mortgage rates against M1. Table II presents the results when M2 is used. In both tables, slope coefficients of all lags are insignificant at the 5 per cent confidence level. These results indicate that given a certain state of expectations, no matter what measure for the money supply or the mortgage rate is used, changes in money supply have no significant impact on mortgage rates. These results conform well to our hypothesis that monetary policy is an ineffective tool of stabilization policy with respect to affecting mortgage rates. While changes in money supply may impact short-term interest rates, as some articles reviewed in this paper display, our empirical tests do not show any significant impact on long-term mortgage rates.

Lag	b_1 (15-year)	M = M1 b_1 (30-year)	b_2 (15-year)	b_2 (30-year)
Lag 1	0.37	0.67	1.11	1.01
	(0.69)	(0.84)	(1.22)	(1.34)
Lag 2	0.80	0.75	1.32	1.40
	(0.90)	(0.91)	(1.11)	(1.44)
Lag 3	1.14	0.74	0.96	0.93
	(0.91)	(0.98)	(0.45)	(0.61)
Lag 4	1.00	1.02	0.99	1.01
	(1.01)	(1.12)	(0.14)	(0.08)
Lag 5	0.32	0.10	−0.34	0.22
	(0.60)	(0.30)	(−0.13)	(0.02)
Lag 6	−0.78	−1.22	0.23	0.43
	(−0.54)	(−1.12)	(0.02)	(0.06)
Lag 7	−0.65	−1.11	−0.15	−0.24
	(−1.11)	(−0.97)	(−0.07)	(−0.07)
Lag 8	−0.22	−0.44	0.33	0.33
	(−0.88)	(−0.79)	(0.13)	(0.06)

Table I.

Notes: $\log I_t = a + b_1 \log M_{t-i} + b_2 \log C_{t-i} + E_t$. January 1990 through April 2004. Numbers in parentheses are t values for the b coefficients

Lag	b_1 (15-year)	b_1 (30-year)	b_2 (15-year)	b_2 (30-year)
		M = M2		
Lag 1	0.70	0.21	1.21	0.92
	(0.95)	(0.80)	(1.25)	(1.06)
Lag 2	0.84	0.70	1.32	1.27
	(0.80)	(0.73)	(1.11)	(1.27)
Lag 3	0.23	0.91	1.20	0.89
	(0.91)	(0.94)	(0.86)	(0.63)
Lag 4	−0.81	−1.28	1.20	0.89
	(−1.14)	(−0.65)	(0.55)	(1.01)
Lag 5	−0.74	−0.15	0.02	0.88
	(−0.60)	(−0.74)	(0.04)	(0.98)
Lag 6	−0.81	−1.00	0.22	0.41
	(−1.23)	(−0.98)	(0.03)	(0.07)
Lag 7	−0.99	−1.51	0.08	0.10
	(−1.10)	(−1.42)	(0.09)	(0.12)
Lag 8	−0.47	−1.43	−0.13	0.16
	(−1.00)	(−1.40)	(−0.13)	(0.02)

Notes: $\log I_t = a + b_1 \log M_{t-i} + b_2 \log C_{t-i} + E_t$. January 1990 through April 2004. Numbers in parentheses are t values for the b coefficients

Table II.

Concluding remarks

Most macroeconomics textbooks lack clear explanations based on empirical evidence on the ineffectiveness of monetary policy. Consequently, many economics students are frequently puzzled about the conflict that exists between what the theory of monetary policy implies and what practical evidence suggests. In this paper, we attempted to provide explanations and empirical evidence to show why monetary policy is frequently ineffective with respect to affecting mortgage rates, and thus investment and aggregate demand. We believe these explanations would help economics students better understand a major drawback of the theory of monetary policy. We further suggest that discussions such as the ones presented in this paper be incorporated in the "Monetary Policy" section of all macroeconomics textbook. Following a review of recent literature on the relationship between money supply and interest rates, and a brief logical explanation of the relationship, we tested the hypothesis that changes in the money supply have no significant impact on mortgage rates. Using a multiple regression of changes in mortgage rates on changes in money supply and consumers' expectations, and utilizing monthly data over the 1990-2004 period, we found support for our hypothesis.

Further reading

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