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Investor sentiment and the stock market's reaction to monetary policy

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ABSTRACT

This paper shows that monetary policy decisions have a significant effect on investor sentiment. The effect of monetary news on sentiment depends on market conditions (bull versus bear market). We also find that monetary policy actions in bear market periods have a larger effect on stocks that are more sensitive to changes in investor sentiment and credit market conditions. Overall, the results show that investor sentiment plays a significant role in the effect of monetary policy on the stock market.

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> It takes months for rate cuts to translate into economic growth ... What a Fed rate cut – or a series of cuts – could change quickly is investor psychology.
>
> The Wall Street Journal, September 17, 2007

1. Introduction

Monetary policy has two primary goals: price stability and sustainable economic growth. Policymakers recognize, however, that these goals can be achieved only through the effects of monetary policy on financial markets, including equity markets.[1] Bernanke and Kuttner (2005) examine the effect of the surprise policy actions on stock prices. They show that the stock market reaction to monetary policy is driven primarily by the effect of the unexpected changes in the fed funds target rate on the equity risk premium. Bernanke and Kuttner (2005) argue that the large effect of monetary shocks on expected excess returns may be related to the influence of monetary policy on the riskiness of stocks or on investor risk aversion. They note, however, that their results are also consistent with investor overreaction or excess sensitivity of stock prices to monetary shocks. In other words, investor psychology may play a significant role in the response of equity investors to monetary news.

Baker and Wurgler (2006, 2007), Brown and Cliff (2005) and Kumar and Lee (2006) show that investor sentiment predicts stock returns in the cross-section and in the aggregate. Their findings indicate that investor sentiment moves stock prices and, therefore, affects expected returns. This raises the question whether the effect of monetary news on stocks is driven, at least in part, by the influence of Fed policy on investor sentiment. The purpose of this paper is to address this question empirically.

Our empirical methodology accounts for possible asymmetries in the effects of Fed policy in different market regimes (bull versus bear market). We find that monetary policy changes in bear markets have similar directional effects on the aggregate stock returns, investor sentiment and expectations of credit market conditions. We also find that policy decisions have little effect on stock returns and sentiment in bull markets. The reaction of investor sentiment to monetary surprises in bear markets is consistent with the notion that investors believe in the Federal Reserve's ability to put a "floor" under stock prices in periods of market stress by easing monetary policy.

In further analysis, we examine the response of stock returns to monetary news in a cross-section of stocks. The results show that the response of stocks to monetary news depends on sensitivity of stock returns to changes in credit market conditions and sentiment

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[1] For example, consider this statement made by Alan Greenspan during an FOMC meeting: "The problem that we have here is that monetary policy works through its effects on overall financial markets. ... The only way to eliminate the wealth effect, which has to be eliminated, is for the discount rate – the market interest rate used by investors to calculate the present value of expected earnings – to rise. ... The question is how we can facilitate that rise." (Transcript of February 1–2, 2000 FOMC Meeting, pp. 124–125.)

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changes. These results lend further evidence that the effect of monetary shocks on investor sentiment plays an important role in the impact of Fed policy on stock returns.

Bernanke and Kuttner (2005) show that changes in timing of expected policy actions have no significant effect on stocks on average. Our results show, however, that unexpected changes in timing of target rate decisions have a large effect on stock returns in bear markets. The effect of such timing changes on the stock market can be traced to their impact on investor sentiment and expectations of credit market conditions.

According to traditional finance theory, economic news should affect security prices only to the extent that it influences the rational present value of expected future cash flows. This paper presents evidence that investor sentiment plays a significant role in the effect of monetary news on the stock market. Since the stock market is an important conduit of monetary policy, our findings contribute to better understanding of the monetary transmission mechanism.

2. Related literature

Our paper contributes to the literature on state dependence in the stock market's response to macroeconomic news. Studies that do not account for time variation in the stock market's response often find little reaction of stocks to macroeconomic fundamentals. For example, Pearce and Roley (1985) find little evidence that the equity market responds to news about inflation and real activity. McQueen and Roley (1993), however, find such evidence after incorporating business cycle variation in the estimation procedure. More recently, Boyd et al. (2005) show that the sign of the stock market's reaction to unemployment news depends on the state of the economy.

In a paper closely related to our study, Chen (2007) finds that monetary policy has a much larger effect on the aggregate stock returns in bear markets then in bull markets. He argues that this asymmetric reaction of stocks to monetary policy can be explained by cyclical fluctuations in the level of financial constraints faced by firms. Similarly, Basistha and Kurov (2008) find that the reaction of stocks to monetary news is much stronger in recessions and in tight credit market conditions than in good economic times. They provide evidence that the state dependence in the stock market's response to monetary news is consistent with the credit channel of monetary transmission.

Our paper adds to the literature in several ways. First, we examine both the effect of unexpected monetary policy actions and the effect of changes in timing of expected policy decisions in different market regimes. Second, we consider the role of investor sentiment in the stock market's reaction to monetary shocks. This analysis contributes to the debate on the effect of investor sentiment on asset prices. Furthermore, most studies looking at the reaction of stocks to macroeconomic news use aggregate returns. In addition to examining the effect of monetary shocks on the overall stock market, we perform a cross-sectional analysis of the response of stock returns. This analysis helps to explain the aggregate results and allows examining cross-sectional heterogeneity in the stock market's response to monetary policy.

3. Key variables and sample selection

3.1. Estimation of monetary surprises

Following Kuttner (2001) and Bernanke and Kuttner (2005), we compute the unexpected component of the federal funds target rate change using the prices of fed funds futures on the day of the meeting of the Federal Open Market Committee (FOMC):

$$\Delta i_t^u = \frac{D}{D-d}(f_t^0 - f_{t-1}^0), \tag{1}$$

where f_t^0 is the fed funds rate implied in the settlement price of the current-month fed funds futures contract, d is the day of the current FOMC meeting and D is the number of days in the month. The settlement price of the fed funds futures is based on the average daily fed funds rate during the contract's delivery month. The first term in Eq. (1) is a scaling factor that accounts for the timing of the announcement within a month.[2]

Bernanke and Kuttner (2005) note that a funds target rate surprise extracted from the current-month futures prices may be, at least in part, a "timing" surprise. In other words, this surprise may be caused by a change in the timing of an expected policy decision rather than by a totally unexpected Fed action. Gürkaynak (2005) and Gürkaynak et al. (2007) present a decomposition of the aggregate monetary surprises into two parts, the level (permanent) surprise and the timing (transitory) surprise. The timing surprise is defined as the component of the total surprise that does not affect the expected fed funds rates beyond the next FOMC meeting. In contrast, the level surprise is defined as the change in the expected interest rate beyond the next meeting. The level surprise is calculated as follows:

$$Level_t = \left[(f_t^1 - f_{t-1}^1) - \frac{d_1}{D_1}\Delta i_t^u\right]\frac{D_1}{D_1 - d_1}, \tag{2}$$

where f_t^1 is the fed funds rate implied in the settlement price of the fed funds futures contract expiring in the month of the next scheduled FOMC meeting, d_1 is the day of the next scheduled FOMC meeting and D_1 is the number of days in that month.[3] We compute the timing surprise as the difference between the total surprise Δi_t^u and the level surprise.[4] The timing and level surprises for our sample are shown in Fig. 1.

3.2. Investor sentiment measures

Investor sentiment is broadly defined as the propensity to speculate. We use two measures of investor sentiment changes to examine the role of investor sentiment in the stock market's reaction to monetary news. The first measure is the index of investor sentiment changes from Baker and Wurgler (2006, 2007). Baker and Wurgler (2006) note that there is no perfect sentiment measure and propose a composite measure that captures the common component of several sentiment proxies. Specifically, the index of sentiment changes is the first principal component of the changes in the following six variables: NYSE turnover, closed-end fund discount, number of IPOs, first-day return on IPOs, the equity share in the new issues and the dividend premium. The six variables are orthogonalized with respect to macroeconomic conditions to remove business cycle variation from the sentiment proxies.[5]

[2] As the scaling factor increases at the end of the month, it amplifies the noise induced by discreteness of the futures prices. To alleviate this problem, when the target rate decision occurs in the last 7 days of the month we use the change in the rate implied in the next-month's contract as the measure of the unexpected target change.

[3] When the date of the next scheduled FOMC meeting is in the last 7 days of the month, we measure the level surprise as the change in the rate implied in the following month's contract.

[4] Gürkaynak (2005) estimates the timing surprise as a residual from the regression of the total surprise on the level surprise. In our sample, this regression yields a coefficient of 0.93 with a standard error of 0.09. To avoid dealing with the generated regressor issue for the timing surprise, we assume that the true coefficient is equal to one and calculate the timing surprise as the difference between the total surprise and the level surprise.

[5] Monthly series of the index of investor sentiment changes is obtained from Jeffrey Wurgler's website (http://pages.stern.nyu.edu/~jwurgler).

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