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The Time Varying Effect of Monetary Policy Surprise on Stock Returns: Bursting Bubble Beating Forward Guidance

When the economy expands too quickly, the Federal Reserve may take steps to slow economic growth by raising short-term interest rates or selling Treasury bonds. Such measures, known as tight monetary policy, reduce the demand for money and curb inflation. However, if restrictive monetary policy actions are unanticipated, they may induce an asset shift from stocks to credit instruments, and stock prices may fall.

In ***PERC*** Working Paper 1505, Dennis W. Jansen, **Jordan Professor of Economics,** and Anastasia S. Zervou, Assistant Professor of Economics, test to what extent surprises in monetary policy affect stock price returns and analyze how this relationship has changed over time. Specifically, the authors track the response of stock price returns to unanticipated changes of monetary policy and explore the evolution effect of monetary policy surprise on bond returns.

It is reasonable to hypothesize that since the conduct of monetary policy and operation of financial markets has changed over time, so has the relationship between the central bank and the stock market. For example, in recent decades, the Federal Reserve has gradually become more transparent and put forth a greater effort to communicate with the public. Beginning in 1999, the Fed began announcing information about future policies, providing forward guidance. With more transparency, expectations about future policy are less dispersed across individuals, which leads to more effective monetary policy.

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Using market data on federal funds futures contracts, the authors extract a measure of the surprise change in the federal funds rate from June 1989 to December 2007 and estimate the effect of a monetary policy surprise on stock price return in the same year. On the whole, stock prices react negatively to a monetary policy surprise. However, this effect varies substantially over time.

The authors find that a one percentage point surprise federal funds rate increase reduces the one-day stock return by 1.33% from 1989-2000 and by 7.47%, or five and a half times more, from 2001-2007. Moreover, surprise monetary policy announcements do not have significant effects for stock returns for the mid- to late-1990s, but do have significant effects during the 2000s.

An important intervening factor in the relationship between monetary policy and the stock market is the existence of a stock price bubble. Generally, tighter monetary policy, in the form of higher short-term nominal interest rates, may help disinflate bubbles. However, in the case of a rational bubble, when all agents have rational expectations and share the same information, monetary policy is less effective.

Therefore, there are two possible explanations of why the data suggest that monetary policy was much less effective in the 1990s as compared to the 2000s. First, monetary policy might appear to be ineffective due to low transparency and high dispersion of expectations about its future path. Second, the dot-com bubble that occurred from the mid-1900s to the beginning of the 2000s could have reduced the effectiveness of monetary policy.

Because there are no economic bubbles in bond prices, the authors analyze data on the time-varying response of bond returns to a monetary surprise to distinguish between these two theories. They find uniform response of bond returns before and after the 2000s, supporting the idea that increased transparency and forward guidance, and not a strong price bubble, is the more plausible explanation.

Given that the effects of a monetary policy surprise on bond returns is weaker in the 2000s compared to the 1990s, the findings indicate that the lower effectiveness of monetary policy in the 1990s is only in the stock market.

Therefore, the authors' novel results indicate that the effect of monetary surprise on stock returns has changed over time. Moreover, their results differ from previous research on this topic, because they suggest that the effect of monetary policy shocks is restored after a market bubble bursts. The authors' findings have useful and important implications for future monetary policy decisions and shed some light on the changing effectiveness pattern of monetary policy on the stock market.

Tradeoffs for Downside Risk Averse Decision Makers and the Self-Protection Decision

Decision-making in economics is about tradeoffs. For risk averse decision-makers, the most important tradeoff is between the size of a random variable and its riskiness. For utility function $u(x)$, when only $u'(x) \geq 0$ and $u''(x) \leq 0$ are assumed, the tradeoff of size for risk is the only one that can be considered.

Whenever a random variable is altered, the change that occurs is either beneficial or harmful depending on the risk preferences of the decision-maker. In expected utility terms, the change either increases or decreases expected utility. When two such changes are made, and these changes offset one another, information concerning that decision-maker's willingness to trade off the one change for the other is revealed, and this information can be used to infer the choices that would be made by other decision-makers whose risk preferences differ in some specific way.

Empirical and experimental evidence shows that decision-makers tend to be downside risk averse, or prudent, a property characterized by $u'''(x) \geq 0$. Agents who are averse to increases in "downside" risk are equivalently averse to changes that shift a certain amount of risk to a lower income level. Because a downside risk increase is similar to a reduction in skewness, downside risk aversion is similar to skewness preference. Downside risk aversion, or skewness preference, is at play when an individual is willing to pay an actuarially unfair amount for a small chance of a large gain.

For downside risk averse decision-makers, there are several additional tradeoffs beyond the basic tradeoff of size for risk that can be considered. This issue is examined in ***PERC*** Working Paper 1503 by ***PERC Research Scientist*** Liqun Liu and his coauthors Michel Denuit, Louis Eeckhoudt and Jack Meyer. Liu and his coauthors identify five additional tradeoffs facing downside risk averse decision-makers and introduce five new stochastic orders to provide the framework for studying these tradeoffs. Each of the new stochastic orders corresponds to a tradeoff facing downside risk averse decision-makers. Importantly, it is shown that these stochastic orders, together with corresponding notions of 2nd and 3rd degree risk aversion, can be used to make predictions regarding choices of downside risk averse decision-makers in environments where downside risk is a factor.

To illustrate these five tradeoffs, the authors utilize a self-protection decision model. There are several advantages to this approach. First, the self-protection decision model is an important, often studied, and not completely understood model. Moreover, in the standard self-protection model, there are just two possible outcomes: a loss of fixed size, L, which occurs with probability p, and no loss, which occurs with probability (1-p). The decision-maker decides how much to spend on self-protection that reduces the probability of losing L.

The analysis of the self-protection decision begins by decomposing the change that occurs when self-protection is increased into two components: an increase in downside risk and another change that must increase expected utility for a downside risk averse decision-maker who chooses more self-protection. Depending only on the parameter values in the self-protection model, this beneficial change can be any one of five categories identifying the set of possibilities.

The authors point out that an increase in self-protection always increases downside risk. So when self-protection, and thus downside risk, increases for a decision-maker with $u'(x) \geq 0$, $u''(x) \leq 0$ and $u'''(x) \geq 0$, the harmful downside risk increase can be compensated for by: 1) a decrease in risk, 2) an increase in size, 3) an increase in size and a decrease in risk, 4) a decrease in both size and risk with the total impact beneficial, and finally 5) an increase in both size and risk with the total impact beneficial.

Choosing to increase the level of self-protection implies that one

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of these five compensating changes also occurs. And when two changes that offset one another occur, information concerning the decision-maker's willingness to make a tradeoff is revealed. This information can be used to infer the choices that would be made by others whose risk preferences differ in a systematic way.

There are two technical components of this paper that are used to address the five tradeoffs that downside risk averse decision-makers face in general and to draw implications for self-protection decision in particular. The first major technical component determines the condition on a pair of cumulative distribution functions (CDFs). This component reflects the fact that two changes to the random variable, an increase in downside risk and one of the five compensating changes, have both occurred. The second technical component of the analysis accomplishes the primary goal of the research- predicting the choices of decision-makers. This step takes the information generated from observing a downside risk averse decision-maker's ranking of two random variables, where one is larger than the other according to one of the five stochastic orders. Then, it is possible to use that information to determine how the same two alternatives would be ranked by others whose risk preferences differ from those of the decision-maker in some systematic way.

In summary, the authors review several well-known changes to random variables to describe the harmful downside risk increase and the beneficial changes to random variables that can compensate for or offset an increase in downside risk. They find that increasing self-protection leads to an increase in downside risk. Whenever more self-protection is chosen, some other offsetting positive change must also occur. These positive changes can be divided into five categories that completely describe all possibilities. The authors' novel findings contribute to the existing literature by providing additional support to confirm the hypothesis that more downside risk averse individuals tend to invest less in self protection.

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TEXAS A&M UNIVERSITY

Private Enterprise
Research Center

Texas A&M University
4231 TAMU
College Station, TX 77843-4231

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Private Enterprise Research Center
Texas A&M University
4231 TAMU
College Station, TX 77843-4231
(979) 845-7722
perc@tamu.edu