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Do financial markets learn from ECB monetary policy?

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HIGHLIGHTS

- We consider how investors dynamically adjust their behavior to ECB signals.
- Our results are consistent with a learning hypothesis to ECB monetary policy announcements.
- We suggest an enhancement of the ECB predictability.

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ABSTRACT

This article examines the magnitude of stock market reactions to European Central Bank (ECB) monetary policy announcements. Since the introduction of the ECB, declining absolute abnormal returns have been compatible with the theory that stock markets learn from ECB monetary policy. In particular, Eurozone financial markets extract information from the ECB announcements and consider this information before making investment decisions. Furthermore, the predictability of ECB monetary policy has been increasing over time.

1. Introduction

According to recent research, the credibility of central banks has a substantial impact on monetary policy. For example, in the Eurozone, the primary objective of the European Central Bank (ECB) is maintaining price stability, and, with greater credibility, the ECB can better restrain inflation rates. This investigation goes beyond these insights to examine as well how the ECB's level of predictability has evolved since its creation, according to the financial markets that observe it.

The semi-strong efficient markets hypothesis predicts that stock prices reflect all publicly available information. Because releases of monetary policies and decisions convey information to stock markets (Funke and Matsuda, 2006), Eurozone financial markets seemingly should react to ECB monetary policy announcements. However, the ECB also seeks predictability as part of its strategy, and financial markets may seek to understand predictive signals about the directions of interest rate developments. We therefore test empirically whether investors learn how to evaluate ECB monetary policy by observing its prior actions. "Learning" in this context means that Eurozone financial markets extract information from ECB announcements and consider this information in their subsequent investment decisions. As central banks have released more information pertinent to monetary policymaking (Geraats, 2009), including better explanations of their policy decisions, this form of transparency has influenced monetary policy more significantly and broadly. Therefore, the predictability of Eurozone stock markets should offer a good indicator of consistency in communication about monetary policy, as well as the effectiveness of monetary policy implementations.

By examining the impact of ECB monetary policy announcements, we can estimate any dispersion in stock market reactions to monetary policy announcements and the determinants of that impact. The event period for this study starts with the creation of

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the ECB. Although monetary policy surprises occur in various settings, not just during central bank meetings, those other events are heterogeneous and adopt a generally wider focus. Moreover, ECB monetary analyses do not directly determine its actions, especially its interest rate decisions. Therefore, we concentrate on stock market reactions to announcements of ECB monetary policy decisions, namely, to the release of the main refinancing operations (MRO) rate by the Governing Council of the ECB. The MRO rate is the main instrument under the control of Eurozone monetary policy makers.

According to literature on the transmission of monetary policy, a change in the target rate affects the real economy, mainly through interest and wealth channels. The most direct and immediate impact of monetary policy decisions is on financial markets (Bernanke and Kuttner, 2005). Many important empirical studies related to the impact of monetary policy on stock markets address the impact of monetary policy announcements on stock prices empirically; they typically reveal an inverse relationship between stock prices and the target rate determined by central banks (Rigobon and Sack, 2004).

However, mixed results also arise from studies across the Eurozone, which might reflect investors' learning about ECB monetary policy. Through learning, investors adjust their forecasting rules to match new information they receive. Thus, learning differences accrue over time and across markets. Because the ECB hopes to achieve predictability, financial markets seemingly should be able to learn effectively from it. To measure the level of this predictability, we consider how investors dynamically adjust their behavior in response to announcements by the ECB. The Eurozone's absolute cumulative abnormal returns around MRO rate announcements should decrease over time, if stock markets learn from ECB communications, because the ECB monetary announcements provide signals that the financial markets can use to update their beliefs about future monetary policy. That is, declining absolute abnormal returns over time would be consistent with ECB predictability when it comes to monetary policy making.

Despite a rich literature regarding monetary policy, surprisingly few large-sample studies consider learning effects in relation to ECB monetary policy. With our innovative approach, we derive several key results. First, Eurozone stock market reactions to ECB MRO rate announcements decrease over time, in support of the notion that the ECB's monetary policy decisions become more predictable. The central bank's decisions thus match previous financial markets' expectations, consistent with a learning hypothesis, because investors adjust their forecasting rules based on new information, and, when that information is predictable, they do not need to make substantial adjustments. Second, macroeconomic variables influence the learning effect too. During strong business conditions, Eurozone stock markets are more likely to overestimate bad news, but they focus on good news during bad times. Third, inflation hinders the ability of stock markets to predict ECB monetary policy. The high price levels appear to trigger uncertainty and nervousness among investors. Fourth, the organization of the ECB influences learning effects. Fifth, in robustness tests, we demonstrate that the learning effect is consistent with our definition of learning and our choices of control variables, potential outliers, status quo, event periods, and stock markets.

The rest of this article is organized as follows. In Section 2, we describe our data and present the methodology. In Section 3, we discuss the empirical results, and then we present robustness tests in Section 4. Finally, we summarize our main conclusions and suggest further research directions in Section 5.

2. Empirical method

2.1. Sample

We collect all ECB announcements around MRO rate that occurred during meetings by the ECB's Council of Governors from January 1, 1999, to December 31, 2008, using the event dates listed on the ECB website. Our sample covers 157 events, and 27 of them denoted changes in MRO rate, including 16 increases and 11 decreases.

2.2. Market reactions to ECB MRO rate announcements

We focus on stock markets, because they are among the most liquid asset markets in the Eurozone. To test our hypothesis, we employ an event study. We used daily stock market index prices from Datastream and investigated the Eurozone aggregate stock market index, the DJ Eurostoxx50 Index. To calculate the returns, we used $R_{i,t} = \ln(\frac{P_{i,t}}{P_{i,t-1}})$, where $P_{i,t}$ is the price index of ECB announcement i on day t. We then calculated the abnormal returns using Fama et al.'s (1969) event study methodology. With our focus on index returns, we selected a mean constant returns model to estimate the abnormal component of returns in the stock market index to an ECB announcement i at date t. To avoid contamination, our estimation period started 220 days before and concluded 20 days before the announcement date.[1] Then, we calculated the cumulative abnormal returns (CAR) by summing the average abnormal returns over the five trading days surrounding the announcement dates [−4 days; +0 day]. This five-day window helped us control for possible news leaks, allowed investors time to gather additional information, and avoided overlapping events.

2.3. Learning effect

To test the learning effect, we regress the following equation:

$$|CAR_i| = \alpha_0 + \alpha_1 \, Time_i + \beta \, Control_i + \epsilon_i, \quad (1)$$

where *Time* measures the calendar time elapsed during the sample period, expressed in days. For example, $Time = 6$ for the ECB MRO rate announced on January 6, 1999. We estimated the dispersion in stock market returns around ECB MRO rate events over time and for a set of control variables related to ECB organization, macroeconomic conditions, and the expected component of the MRO rate announcements. The prediction about α is specific to the learning hypothesis; we anticipate a negative relationship between *Time* and $|CAR_i|$.

2.4. Control variables

We include variables to control for economic conditions, exchange rate, inflation, interest rates, ECB organization, and monetary policy announcement surprises, in line with prior literature. News conveys clear information about growth expectations. We expect that the investor's behavior changes with business conditions (Veronesi, 1999). To capture this effect, we included an interactive term between GDP growth (*GDP Growth*) and the change in the MRO rate variables (ΔMRO). We also included the Euro–US Dollar exchange rate (*EUR–USD*). Inflation news increases investor uncertainty though. Since its inception, the ECB has included a price stability objective in its monetary policy strategy. Low, stable inflation promotes financial market stability. Therefore, lower inflation should exert a calming effect on stock market volatility. We use Harmonised Index Consumer Prices (HICP) (Inflation) to control for inflation. We used the long-term interest rate (*LT Interest Rates*), because the signs of long-term interest rate reactions likely are determined by changes in expected inflation. In 2002, the ECB instituted its current policy, announcing changes to the MRO target rates twice per month. This organizational change reflected practical reasons and the goal of avoiding overly frequent decisions that

[1] Our results are robust to the length of the estimation period.