



Simultaneous monetary policy announcements and international stock markets response: An intraday analysis

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ABSTRACT

This paper investigates the return and volatility response of major European and US equity indices to monetary policy surprises by utilizing extensive intraday data on 5-min price quotes along with a comprehensive dataset on monetary policy decisions and macroeconomic news announcements. The results indicate that the monetary policy decisions generally exert immediate and significant influence on stock index returns and volatilities in both European and the US markets. The findings also show that press conferences held by the European Central Bank (ECB) that follow monetary policy decisions on the same day have a clear impact on European index return volatilities. This implies that they convey additional important information to market participants. Overall, our analysis suggests that the use of high frequency data is critical to separate the effect of monetary policy actions from those of macroeconomic news announcements on stock index returns and volatilities.

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1. Introduction

The objective of this paper is to investigate the effects of monetary policy actions on major European (France, Germany, Switzerland and UK) and US stock index returns and volatilities utilizing high frequency 5-min observations along with an extensive dataset on monetary and macroeconomic news announcements.

There are several channels through which monetary policy announcements may affect equity prices. Firstly, monetary policy decisions may simultaneously affect firms' cash flows and influence risk-adjusted discount rates. Secondly, the announcements may convey information about future economic activity and thus, act as a signal. Thirdly, monetary policy decisions may lead to changes in equity prices through portfolio adjustments in multiple markets. Finally, some recent studies, such as Kurov (2010), have shown that investor sentiment plays a significant role in the effect of monetary news on the stock market.

Traditionally, papers studying the effects of monetary policy announcements on asset prices have mainly relied on lower frequency observations.¹ However, an important issue that arises when measuring the effect of monetary policy on equity markets

is that changes in interest rates can coincide with changes in business cycle conditions and other relevant economic variables. Therefore, it is not clear whether the effect attributed to monetary policy decisions in the existing literature reflects other information as well. Moreover, as argued by Rigobon and Sack (2004), the relation between equity prices and interest rates can be causal. Therefore, not accounting for endogeneity may cause a significant bias in the empirical estimation of the reaction of equity returns to monetary policy.² Another central issue is the choice of correct proxy for change in monetary policy. Typically, event studies have relied on monetary policy changes that are simply measured as changes in policy rates on days of monetary policy decisions.³ However, Kuttner (2001) convincingly shows that markets generally react to the unexpected component of the monetary policy announcement, which is consistent with the efficient markets hypothesis that asset prices should only react to new information.⁴ Moreover, Gürkaynak et al.

² Rigobon and Sack (2004) deal with the potential endogeneity of policy issues that arises from the effect of equity price movements on interest rates combined with the effect of implied aggregate demand on equity prices. This reverse causality may cause endogeneity bias in empirical estimation.

³ See, for example, Bomfim (2003) and Durham (2003). Moreover, Rigobon and Sack (2004) argue that event study approach may give biased estimates.

⁴ Fatum and Scholnick (2008) confirm this finding by investigating whether exchange rates respond to the surprise component of actual monetary policy changes and whether exchange rates respond to the expected component of such policy changes. Their results indicate that exchange rates respond only to the surprise component of a US monetary policy change. See also Chuliá et al. (2010).

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¹ See, for example, Bredin et al. (2003, 2007), Basistha and Kurov (2008), and Ehrmann and Fratzscher (2004), among others.

(2005) argue that monetary policy surprises contain more than just a surprise to the announced target rate. They demonstrate that two factors are needed to capture monetary policy surprises: a target surprise and path surprise. The target surprise is defined as the degree to which market participants have been able to predict the actual monetary policy decisions. The path surprise reflects news that market participants have learned from the monetary policy statements about the future path of policy in addition to what they have learned about the level of target rates.

Fewer papers to date have investigated the response of equity prices to monetary policy actions using high frequency data. Among the earlier papers based on intraday observations, Farka (2009) reports a significant impact of monetary policy shocks on the level and volatility of stock returns in the US. Utilizing a Generalized Autoregressive Conditional Heteroskedasticity (GARCH) model, the author also reports that the response of conditional volatility depends on the type and timing of the policy shocks. Andersson (2010) examines bond and stock market volatility reactions in the euro area and the US following their respective economies' monetary policy decisions.⁵ He finds a strong upsurge in intraday volatility at the release of monetary policy decisions by the two central banks. Moreover, his results also indicate a significant increase in stock index volatility in connection with target and path surprises. Wongswan (2009) studies the impact of US monetary policy surprises on equity indices in 16 countries. The author finds that the US and most of the foreign equity indices react to surprise changes in the current target rate by the Federal Open Market Committee (FOMC) but not to path surprises. However, his analysis is limited to measuring the effect of FOMC monetary policy surprises on the US and foreign stock markets. Lunde and Zebede (2009) examine FOMC announcements and real-time changes in market expectations about future policy announcements and their impact on the intraday volatility dynamics of the SP500 index. Their analysis shows elevated intraday volatility following FOMC announcements through the market close, with a spike at the time of the announcement.

There are a number of recent papers that examine the effect of central banks' monetary policy decisions and communications strategies on financial markets. Brand et al. (2006) examines the effect of European Central Bank (ECB) monetary policy decisions and communications on the euro area yield curve. Their results show that news stemming from the ECB's communication has a significant and sizeable impact on medium to long term interest rates, while immediate policy decisions have an impact only at shorter maturities. Ehrmann and Fratzscher (2005) compare the communication strategies of the Federal Reserve, the Bank of England and the European Central Bank. Their findings suggest that central bank communication is a key determinant of the market's ability to anticipate monetary policy decisions and the future path of interest rates. Rosa and Verga (2008) examine the effect of European Central Bank communication on the price discovery process in the Euribor futures market using a tick-by-tick dataset. Their results show that the unexpected component of ECB explanations has a significant and sizeable impact on Euribor futures prices. Other papers, such as Ehrmann and Fratzscher (2007) and Rosa and Verga (2007), find that a change in the tone of central banks statements, measured through the construction of a subjective wording indicator, can explain change in financial asset returns. Nautz and Schmidt (2009) investigate how the implementation of monetary policy affects the dynamics and the volatility of the US federal fund rate. They show that the improved communication

and transparency regarding the federal funds rate target has significantly contributed to stabilize the federal fund rate.⁶

This paper contributes to the existing literature in many ways. Firstly, it utilizes extensive data on 5-min price quotes from major European and the US equity indices along with a comprehensive set of monetary and macroeconomic news announcements. Our dataset allows us to measure the precise effect of monetary policy actions on stock index returns and volatilities.⁷ Secondly, this paper explicitly measures the effect of ECB press conferences on European stock markets volatilities, which to our knowledge not has been addressed in earlier research.⁸ Moreover, following Gürkaynak et al. (2005), we check the return and volatility response to both the target and path surprise component of monetary policy decisions. Finally, drawing on the methodology proposed by Andersen et al. (2003), our robust estimation procedure takes into account strong intraday seasonalities typically found in the volatility of financial markets. These seasonalities have important implications for modeling volatility of high frequency data. Andersen and Bollerslev (1997, 1998) argue that standard time series models of volatility fail to capture strong intraday seasonalities when applied to high frequency return data. Overall, this paper presents fresh empirical evidence on the precise effect of monetary policy surprises on major European and the US stock indices.

The main results of this paper are as follows. Monetary policy surprises generally exert significant influence on stock index returns and volatilities in both European and the US markets. Moreover, the response of the stock indices to monetary policy actions is usually swift and fades away quickly within 5–10 min after the announcements. Our results also show that volatilities of European stock indices are significantly influenced by the ECB press conference that is held 45 min after the monetary policy decisions on the same day, implying that it contains important additional information for market participants. However, in contrast to some earlier evidence, our results indicate that European and US markets do not generally respond to path surprises. Overall, our analysis suggests that the use of high frequency data is critical to separate the effect of monetary policy actions from those of macroeconomic news announcements on the stock index returns and volatilities.

The strategy for this paper is twofold. Firstly, a descriptive analysis is carried out on the volatility behavior of international stock indices to determine the extent to which intraday seasonalities could be explained by monetary policy announcements. Secondly, a robust estimation procedure is specified to test the effect of monetary policy surprises on stock indices returns and volatilities. The rest of the paper is structured as follows: The data are described in Section 2. A descriptive framework is outlined in Section 3. The methodology is presented in Section 4. The empirical findings are reported in Section 5, and a summary and conclusions follow in Section 6.

⁶ Kobayashi (2009) documents the same phenomenon for the US prime rate.

⁷ This setting particularly facilitates measuring the effect of European monetary policy decisions on European stock indices since they share same trading hours, implying that various economic news from European markets may potentially affect equity prices during a particular trading day. Thus, the high frequency dataset enables us to separate the effects of monetary policy actions from those of other macroeconomic variables on the stock index returns and volatilities. Moreover, the use of such data reduces the problems of endogeneity and omitted variable bias.

⁸ The monetary policy announcements by the European Central Bank (ECB) at 13:45 Central European Time (CET) are typically followed by a press conference where the President of the ECB comments on the considerations underlying monetary policy decisions and gives his views on general economic outlook at 14:30 Central European Time (CET). Since the timing of the ECB press conference coincides with key US macroeconomic announcements, it is important to isolate the effect of the ECB press conference from those of US macroeconomic news announcements.

⁵ Andersson (2010) employs high frequency data on STOXX50 as a representative index for the Euro area.

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