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The time-varying response of foreign stock markets to U.S. monetary policy surprises: Evidence from the Federal funds futures market[☆]

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ABSTRACT

In this paper, we estimate the time-varying response of foreign stock markets to U.S. monetary policy shocks derived from the high-frequency Federal funds futures market. Our results show significant time-variation in the response of the global equity markets to U.S. monetary policy surprises, where an unanticipated interest rate cut leads to an increase in stock returns. Our findings suggest that the foreign stock markets respond more to U.S. monetary policy surprises during the crisis periods. We also find that the stock markets in Europe and the U.S. responded negatively to unanticipated interest rate cuts by the Fed during the recent financial crisis.

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1. Introduction

The impact of U.S. monetary policy shocks on asset prices, especially equity prices, has always been one of the topics of great interest to the policymakers and the market participants. It enables the policymakers to assess the wealth channel in the monetary policy transmission process, and it affects the portfolio valuations of the market participants. Different methods have been proposed to estimate monetary policy shocks in the literature. Among these methodologies, monetary policy shocks based on the Federal funds futures rate have received widespread attention recently.¹ Using

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¹ See Kuttner (2001), Bernanke and Kuttner (2005) among others.

this approach, [Bernanke and Kuttner \(2005\)](#) provide evidence that a typical unanticipated Fed rate cut of 25 basis points leads to roughly 1 percent increase in the S&P 500 index returns. According to them, such a policy action elicits a positive response because it favorably impacts the future dividend streams, reduces the discount rate and increases the equity market premium. This line of study has been extended to foreign stock markets, as globalization and technological revolution have made the global markets much more tightly interlinked with each other. In the international context, [Ehrmann and Fratzscher \(2009\)](#) and [Hausman and Wongswan \(2011\)](#) find that foreign equity returns respond positively to an unanticipated interest rate cut by the Fed. They attribute the cross country variation in responses to the level of financial market integration and the degree of exchange rate flexibility of the country.²

However, most of the existing studies on the high frequency response of stock returns to monetary policy shocks use a fixed-coefficient approach. The underlying assumption is that the response of stock returns to monetary policy shocks remain unchanged over time. This is in contrast to the anecdotal and formal evidence that suggest that the response of stock returns varies over time. For example, [Andersen et al. \(2007\)](#) find that the equity market's response to macroeconomic news depends on the stage of the business cycle. Similarly, equity risk premia, which explains the response of the stock returns to monetary policy surprises according to [Bernanke and Kuttner \(2005\)](#) are found in the literature to vary over time. [Campbell et al. \(1997\)](#) also find that equity market premium varies over time and this variation is quite large relative to the variation in expected real interest rate. Similarly, [Bekaert and Harvey \(1995\)](#) have found that a number of emerging markets exhibit time-varying global market integration. All these factors suggest that modeling the stock market reaction to monetary policy surprise using a fixed-coefficient approach is not appropriate.

Our study contributes to the existing literature by taking into account the possible time-variation in the foreign equity market's responses to U.S. monetary policy shocks.³ Following the pioneering work of [Cooley and Prescott \(1976\)](#), the time-variation is modeled as a driftless random walk, and is estimated using the maximum likelihood via the Kalman filter. We argue that this is an appealing and flexible way of uncovering changes in the responsiveness of stock returns to monetary policy shocks. Our framework also allows for heteroscedasticity present in the error term that is typical in a high frequency stock returns data. To do so, we follow [Harvey et al. \(1992\)](#) and allow conditional heteroskedasticity in the error term.

Our results show significant time-variation in the stock market response to U.S. monetary policy surprises for all 35 countries under our study. We find substantial comovement in the response of the European equity markets to U.S. monetary policy surprises for the whole sample period. This is not surprising since there is a high degree of financial integration among the European countries. The response of the stock markets of emerging market economies and Latin American economies to U.S. monetary policy shocks is found to be much more divergent as compared to the European stock markets. Our results also suggest that the emerging markets' stock markets are more sensitive to the Fed's surprises, especially during the recessions and the crisis periods.

We also find a noticeable common feature in the stock markets' reaction to monetary policy surprise. During abnormal periods that include recessions and different crisis episodes,⁴ U.S. monetary policy surprise has a much larger impact on the equity markets of almost all the 35 countries in our sample. For example, a hypothetical 25 basis points unexpected rate cut by the Fed during a crisis period could elicit a positive response in the stock returns up to as high as 2.5 percent in case of the U.S., Canada and European countries, 7.5 percent in case of Korea, and 5 percent in case of Hong Kong, Singapore and the Latin American economies. This is not a surprising result since the stock market's response to macroeconomic news have been found to depend upon different states of the business cycles according to [Andersen et al. \(2007\)](#). One of the interesting findings of our study relates to the

² [Wongswan \(2009\)](#) and [Ehrmann and Fratzscher \(2009\)](#) reach similar conclusions.

³ Our paper is an attempt to examine the empirical regularity in how the foreign stock markets respond over time to U.S. monetary policy surprises that have been derived from the high frequency Federal funds futures market. We do not test for the explicit linkage between country characteristics and its response over time to U.S. monetary policy surprise. While this may be an important issue to explore, this is beyond the scope of this paper.

⁴ In our sample, there are three abnormal events: the LTCM crisis in 1997, 2001 recession and the financial crisis of 2008.

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