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journal homepage: www.elsevier.com/locate/jmeRisk, uncertainty and monetary policy[☆]Geert Bekaert^{a,*}, Marie Hoerova^b, Marco Lo Duca^b^a Columbia Business School and NBER, United States^b European Central Bank, Germany

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ABSTRACT

The VIX, the stock market option-based implied volatility, strongly co-moves with measures of the monetary policy stance. When decomposing the VIX into two components, a proxy for risk aversion and expected stock market volatility (“uncertainty”), we find that a lax monetary policy decreases both risk aversion and uncertainty, with the former effect being stronger. The result holds in a structural vector autoregressive framework, controlling for business cycle movements and using a variety of identification schemes for the vector autoregression in general and monetary policy shocks in particular. The effect of monetary policy on risk aversion is also apparent in regressions using high frequency data.

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1. Introduction

A popular indicator of risk aversion in financial markets, the VIX index, shows strong co-movements with measures of the monetary policy stance. Fig. 1 considers the cross-correlogram between the real interest rate (the Fed funds rate minus inflation), a measure of the monetary policy stance, and the logarithm of end-of-month readings of the VIX index. The VIX index essentially measures the “risk-neutral” expected stock market variance for the US S&P500 index. The correlogram reveals a very strong positive correlation between real interest rates and future VIX levels. While the current VIX is positively associated with future real rates, the relationship turns negative and significant after 13 months: high VIX readings are correlated with expansionary monetary policy in the medium-run future.

The strong interaction between a “fear index” (Whaley, 2000) in the asset markets and monetary policy indicators may have important implications for a number of literatures. First, the recent crisis has rekindled the idea that lax monetary policy can be conducive to financial instability. The Federal Reserve’s pattern of providing liquidity to financial markets following market tensions, which became known as the “Greenspan put,” has been cited as one of the contributing factors to the build-up of a speculative bubble prior to the 2007–09 financial crisis.¹ Whereas some rather informal stories have linked

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¹ Investors increasingly believed that when market conditions were to deteriorate, the Fed would step in and inject liquidity until the outlook improved. See, for example, “Greenspan Put May be Encouraging Complacency,” Financial Times, December 8, 2000.

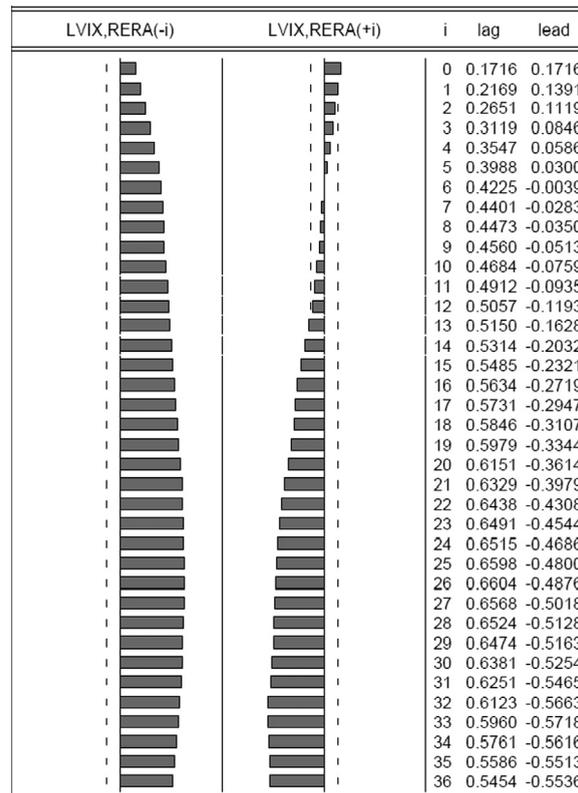


Fig. 1. Cross-correlogram LVIX RERA.

Notes: The first column presents the (lagged) cross-correlogram between the log of the VIX (LVIX) and past values of the real interest rate (RERA). The second column presents the (lead) cross-correlogram between LVIX and future values of RERA. Dashed vertical lines indicate 95% confidence intervals for the cross-correlation. The third column presents the cross-correlation values. The index i indicates the number of months either lagged or led for the real interest rate variable. The sample period is January 1990–July 2007.

monetary policy to risk-taking in financial markets (Rajan, 2006; Adrian and Shin, 2008; Borio and Zhu, 2008), it is fair to say that no extant research establishes a firm empirical link between monetary policy and risk aversion in asset markets.²

Second, Bloom (2009) and Bloom et al. (2009) show that heightened “economic uncertainty” decreases employment and output. It is therefore conceivable that the monetary authority responds to uncertainty shocks, in order to affect economic outcomes. However, the VIX index, used by Bloom (2009) to measure uncertainty, can be decomposed into a component that reflects actual expected stock market volatility (uncertainty) and a residual, the so-called variance premium (see, for example, Carr and Wu, 2009), that reflects risk aversion and other non-linear pricing effects, perhaps even Knightian uncertainty. Establishing which component drives the strong co-movements between the monetary policy stance and the VIX is therefore particularly important.

Third, analyzing the relationship between monetary policy and the VIX and its components may help clarify the relationship between monetary policy and the stock market, explored in a large number of empirical papers (Thorbecke, 1997; Rigobon and Sack, 2004; Bernanke and Kuttner, 2005). The extant studies all find that expansionary (contractionary) monetary policy affects the stock market positively (negatively). Interestingly, Bernanke and Kuttner (2005) ascribe the bulk of the effect to easier monetary policy lowering risk premiums, reflecting both a reduction in economic and financial volatility and an increase in the capacity of financial investors to bear risk. By using the VIX and its two components, we test the effect of monetary policy on stock market risk, but also provide more precise information on the exact channel.

This article characterizes the dynamic links between risk aversion, uncertainty and monetary policy in a simple vector-autoregressive (VAR) system. Such analysis faces a number of difficulties. First, because risk aversion and the stance of monetary policy are jointly endogenous variables and display strong contemporaneous correlation (see Fig. 1), a structural interpretation of the dynamic effects requires identifying restrictions. Monetary policy may indeed affect asset prices through its effect on risk aversion, as suggested by the literature on monetary policy news and the stock

² For recent empirical evidence that monetary policy affects the riskiness of loans granted by banks see, for example, Altunbas et al. (2010), Ioannidou et al. (2009), Jiménez et al. (forthcoming), and Maddaloni and Peydró (2011).

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