



Monetary policy and stock prices – Cross-country evidence from cointegrated VAR models



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ABSTRACT

This study applies the Cointegrated Vector-Autoregressive (CVAR) model to analyze the long-run relationships and short-run dynamics between stock markets and monetary policy across five developed and three emerging economies. Our main aim is to check whether monetary policy plays an important role for stock market developments. As an innovation, monetary policy enters the analysis from three angles: in the form of a broad monetary aggregate, short-term interest rates and net capital flows. Based on this framework, we analyze whether central banks are able to influence stock market developments. Our findings suggest different patterns and causalities for emerging and industrial economies with the stock markets of the former economies more frequently related to monetary aggregates and capital flows. A direct long-run impact from short-term interest rates on stock prices is only observed for 3 out of 8 economies.

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1. Introduction

A breakdown of stock markets are a key feature of economic and financial crisis, with the meltdown of Lehmann brothers in September 2008 providing the most frequent example. There is a two-way causality between market sentiments and stock prices: Optimism can drive up stock prices and might also stem from increasing stock prices. In this vein, explanations for bubble behavior of stock markets include rational speculation, contagion and herding behavior (Pepper, 1994; Rajan, 2005). In a nutshell, investment of market participants increases when prices go up and less when prices go down, essentially providing a bet of being able to get out before the market turns (Campbell et al., 1997).

Stock market booms and busts can result from different economic circumstances. For emerging markets, short-term capital flows bear the potential to initially increase stock prices and triggering significant decreases if they reverse at a later stage. More

generally, excess liquidity stemming from monetary policy decisions is considered to be a key driver of stock market developments (Borio et al., 1994). An expansionary path of monetary policy improves lending conditions for market participants and can fuel optimism and rising stock prices (Allen and Gale, 2002). On the other hand, the popular line of reasoning that a decline in stock prices is observed in response to a tightening of monetary has not been convincingly justified (Galí and Gambetti, 2013).

Traditional studies view the stock market as a possible transmission channel through which monetary policy can influence inflation and real activity (Rozeff, 1975). Sellin (2001) provides an excellent overview regarding various strings in the literature that deal with different stages of the transmission process. In a nutshell, two different kinds of studies can be distinguished. The first group looks at the dynamics between monetary policy tools and stock prices, while second tackles the question of whether stock prices and inflation, as the final objective of monetary policy, are related.

From today's perspective, the first issue seems the more relevant, considering the developments over recent decades, which can be characterized by three main phenomena: on the one hand, strong and persistent money growth has coincided with low and constant inflation rates. At the same time, world trade, financial globalization and international capital flows have increased significantly. Finally, large asset price swings and an increasing number

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of financial crises have occurred. Many economic observers point to globalization and the resulting pricing-to-market of companies to explain concurrent low inflation rates. They hypothesize that, contrary to conventional theory, excess liquidity in the system has not led to increases in the prices of goods. Instead, it has been the antecedent to excessive asset price rises and increased volatility, such as in housing, commodities and stocks. Hence, stock prices have attracted considerable attention from monetary policymakers and excelled their solely roles as an indicator on the way to achieving price stability.

Against this background, the present study analyzes the relationship between monetary policy and stock prices for selected countries. Our general aim is to dissect the long-run and short-run dynamics between monetary policy and stock market developments. From a direct policy perspective, the issue we tackle is whether central banks are able to influence stock markets. We provide a number of important contributions. Firstly, monetary policy enter the analysis from different angles: In form of the money market rate which is directly controlled by the central bank, as broad monetary aggregates which are not directly controlled but heavily influenced by monetary policy and as net capital flows which we consider as a result of spillover effects resulting from global monetary policy.² A second contribution springs from the fact that we take into account both industrial and emerging economies to identify specific patterns, including and excluding the recent financial crisis. Finally, we rely on a Cointegrated Vector-Autoregressive (CVAR) model where all variables are endogenous to dissect the long-run behavior and short-run dynamics between stock prices, monetary policy and main economic indicators. We also include sentiment indicators as a measure of economic moods for economies when available.

When analyzing the relationship between stock prices and monetary policy, the issue of identification is of crucial importance. Under a Taylor-Rule, monetary policy and stock prices are both determined by GDP and inflation.³ Previous research has frequently identified monetary policy shocks based on prior economic restrictions within a structural VAR framework (Sellin, 2001).⁴ Within our framework, a distinction between statistical and economic identification is necessary. Statistical identification is achieved by normalization of the cointegrating vectors (in case of one long-run relationship) or through just-identifying restrictions (in case of more than one long-run relationship). Economic identification is obtained if further theory-guided restrictions are adopted (Juselius, 2006). As a first step, we therefore estimate the co-integrating relationship between stock prices and either the monetary policy rate, money supply or capital flows in a bivariate framework without including further variables. We proceed by including GDP and inflations as well as further variables into our cointegrating system. Hence, we consider both narrow models only consisting of stock markets and monetary policy as well as a broad setting which enables us to identify the key parities representing the domestic economies and analyze whether the core results depend on the system under investigation.

As our dataset includes the recent financial crisis, it is worth mentioning that the effects of including this tumultuous period are not the primary subject of our investigation, although we do account for possible effects within our framework. The remainder of this paper is organized as follows: the following section provides working hypotheses as a guideline for the remaining analysis. Section 3 describes data and modeling cycle. In Section 4, the results are presented and analyzed. Section 5 concludes the study.

2. Literature review and working hypotheses

Several studies have analyzed relationships between stock prices, monetary policy and inflation and it seems advisable to provide a brief overview at this stage. When it comes to analyzing the relationship between monetary policy tools and stock prices, the early literature focuses on the impact of money supply changes on stock prices. As summarized by Maskay (2007), two different views can be roughly distinguished: Sellin (2001) argues that the money supply will affect stock prices only if the change in money supply alters expectations about future monetary policy. According to this view, expansionary monetary policy will result in expectations of tightening monetary policy in the future and decrease stock prices. The second group, labelled as “real activity economists”, argue that a positive money supply shock will increase stock prices due to signaling higher economic activity and increasing cash flows (Maskay, 2007). A popular line of reasoning regarding the role of interest rate changes for stock prices is that increasing interest rates raise the discount rate, which would decrease the value of stock prices. Empirically, this question has for example been assessed by Bernanke and Kuttner (2005) who focus on the evolution of equity prices after changes of the federal funds rate and find stronger impacts of unannounced changes.

From today's perspective, early empirical studies suffered from an endogeneity problem since the causality between stock prices and monetary policy is not clear-cut. More recent studies like the one provided by Bernanke and Kuttner (2005) have addressed this issue by applying VAR models and provided useful insights. However, a distinction between short-run dynamics and long-run equilibria is not provided by those studies. A field where both cointegration and VAR techniques have been frequently adopted deals with the relationship between inflation and stock prices. An early study in this context which explicitly adopts cointegration techniques is provided by Ely and Robinson (1997) who focus on industrial countries and analyze dynamics between real output, money supply, stock prices and good prices. Their study focuses on the dynamics between inflation and stock prices rather than addressing the issue whether direct monetary policy tools and stock prices share similar dynamics over different horizons. See Sellin (2001) for an early overview regarding related studies. From a theoretical DSGE perspective, Nisticò (2012) shows that monetary policy reactions to deviations of the stock-price level from equilibrium includes risks of endogenous instability but can also be beneficial from an overall real stability perspective. In a recent empirical study, Galí and Gambetti (2013) adopt a time-varying coefficient VAR model and find evidence for increasing stock prices in response to an exogenous tightening of monetary policy.

To develop an adequate modeling strategy, we now identify various working hypotheses, which are then empirically tested according to the modeling cycle we explained in the previous section. Although some of the hypotheses refer to standard results in the literature, they are well suited to guide the reader through the large set of estimation results

H1. Market agents' behavior (herding, rational speculation, contagious confidence and optimism) leads to strong persistence in stock market developments, i.e., shocks to the stock market have positive long-run effects on future developments.

This issue is analyzed by testing for a unit root in stock prices and analyzing whether a relationship between stock prices and sentiment indicators exists.

H2. Long-run equilibria between stock prices and liquidity conditions can be identified.

² See Belke et al. (2009) for a different measure of global liquidity.

³ We are grateful to an anonymous referee for raising the point of identification.

⁴ Hau and Lai (2013) analyze real effects of stock underpricing and focus on issues and endogeneity issues in a different empirical framework which is not suited within our time series framework.

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