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# The euro area stock market channel: Does one size fit all? ☆

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ABSTRACT

This paper analyzes the first part of the stock market channel of monetary policy in the euro area. We find heterogeneous reactions of euro area stock markets to unexpected ECB's interest rate decisions. Splitting all markets into two groups, covering the stock markets reacting significantly to monetary policy shocks and the ones which do not, each sub-group reveals a higher degree of homogeneity. Interestingly, the markets, which react significantly to unexpected interest rate decisions are the markets with the highest stock market capitalization. In general, we find ECB's decisions to be well anticipated by stock markets.



## 1. Introduction

Similar transmission processes of interest rate decisions among member countries are a precondition for an effective monetary policy in a currency union. This paper contributes to the literature by quantifying reactions of European Monetary Union (EMU) stock markets to the unexpected component of monetary policy decisions of the European Central Bank (ECB). Thus, we provide evidence

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for the first part of the stock market channel, which captures how monetary impulses impact the real economy through the stock market.[1] The stock market channel has become increasingly important in the euro area, especially during the last ten years as firms have raised an increasing share of capital through the stock markets and private investors have used the stock markets more actively for financial investments or retirement provisions (Beck et al., 2000; Eurostat, 2007).

The endogeneity of stock returns and the policy interest rate is taken into account by applying the identification through heteroskedasticity approach following Rigobon and Sack (2004), Rigobon (2003). We apply this technique to all first wave euro area stock markets and extend the analysis by separately estimating the relationships of interest for financial and non-financial sectors as well as by conducting a series of homogeneity tests. We present new evidence about the degree to which the ECB's monetary impulses impact EMU member states homogeneously.

## 2. Methodology

The interaction between stock prices and monetary policy can be captured in a stylized two equation framework

$$\Delta i_t = \beta \Delta s_t + \gamma z_t + \epsilon_t \tag{1}$$

$$\Delta s_t = \alpha \Delta i_t + z_t + \eta_t. \tag{2}$$

Eq. (1) is a simplified version of a monetary policy reaction function where the change in the short-term interest rate $(\Delta i_t)$ responds to stock returns $(\Delta s_t)$, a set of other variables $z_t$ (assumed to be exogenous), and a monetary policy shock $(\epsilon_t)$. Stock returns, as shown in Eq. (2), are explained by the change in the interest rate, other variables denoted by $z_t$, and a error term $(\eta_t)$.[2] $\alpha$ is the parameter of interest in our investigation.

When empirically estimating the relationship between stock returns and interest rate changes the problem of endogeneity emerges. We apply the identification through heteroskedasticity approach of Rigobon and Sack (2004), Rigobon (2003), in order to account for this issue. They show that an increase in the variance of the monetary policy shock $(\epsilon_t)$ in Eq. (1) reduces the bias from the simultaneity problem and from the exclusion of other exogenous variables contained in Eq. (2). In their approach, the *level* of the bias in $\alpha$ is not required to be zero. In contrast, the parameter $\alpha$ is estimated from the *change* of the bias as the variance of the monetary policy shock changes. Applying this method, it is the change in the covariance of stock prices and interest rates which allows to identify the parameter of interest when the variance of the policy shock changes.

The procedure assumes the variance of the monetary policy shock to be higher on policy days than on other days. Consequently, we define two subsamples. $F$ contains the policy dates, i.e., the days the central bank decides about its interest rates. $F^*$ then consists of the non-policy dates which we define as the day immediately preceding the policy date. The other shocks are supposed to exhibit the same magnitude throughout the observed period.[3] Rigobon and Sack (2004) show in detail how $\alpha$ can be identified mathematically. In order to empirically implement the identified parameter, we use an instrumental variables approach. Let $T$ be the number of ECB Governing Council meetings and the date indices, $t(k), k = 1, 2, \ldots, 2T$, placed in chronological order and $t(k) \in F \cup F^*$. The parameter of interest is then estimated by

$$\hat{\alpha} = \left(w_i' \Delta i\right)^{-1} \left(w_i' \Delta s\right). \tag{3}$$

Stock returns $(\Delta s)$ and interest rate changes $(\Delta i)$ are both vectors each covering at first policy dates $(F)$ followed by non-policy dates $(F^*)$. The vector of instruments $(w_i)$ is defined as

[1] It is beyond the scope of this paper to measure the impact on the real economy stemming from the second part of the stock market channel. See Jansen and Nahuis (2003), Pastor and Veronesi (2003) or Poterba (2000) for evidence on the linkage between stock returns and private consumption or firms' investment.

[2] For notational simplicity, we consider a case in which $z_t$ is a single variable. For identification purposes and since $z_t$ is an unobserved common shock, we normalise its coefficient in the second equation to be one (Rigobon, 2003).

[3] Consequently, the set of other variables $(z_t)$ is not required for the empirical implementation (Rigobon and Sack (2004)).