



Does monetary policy determine stock market liquidity? New evidence from the euro zone ^{☆,☆☆}

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ABSTRACT

The recent financial crisis has been characterized by unprecedented monetary policy interventions of central banks with the intention to stabilize financial markets and the real economy. This paper sheds light on the actual impact of monetary policy on stock liquidity and thereby addresses its role as a determinant of commonality in liquidity. Our results suggest that an expansionary monetary policy of the European Central Bank leads to an increase of aggregate stock market liquidity in the German, French and Italian markets. Furthermore, the effect of monetary policy is significantly stronger for smaller stocks, suggesting a non-linear impact of monetary policy on stock liquidity.

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1. Introduction

The liquidity of financial markets, defined as “the ease of trading” (Amihud et al., 2005), has recently attracted a lot of attention, as the financial crisis highlighted its role as a precondition for efficient markets. Although central banks all over the world tried to ease financial markets during the recent crisis period by means of massive monetary policy interventions, we know surprisingly little so far about the actual relationship of monetary policy on stock liquidity.

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Since Amihud and Mendelson (1986) suggested that stock returns are an increasing function of illiquidity, numerous successive studies investigated this relationship. Indeed, the empirical literature generally confirms the theoretical proposition that investors demand higher gross returns as compensation for holding less liquid stocks.¹ Another well-established strand of the literature on asset liquidity documents that the liquidity of individual stocks exhibits significant co-movement, which is usually referred to as commonality in liquidity.² Covariation in the liquidity of stocks implies that the illiquidity risk cannot be diversified and therefore illiquidity should be regarded as a systematic risk factor.³ Furthermore, the observed commonality suggests the assumption that there needs to be at least one common factor that simultaneously determines the liquidity of all stocks in a market, which might be monetary policy.⁴

The hypothesis we test in this paper is that the monetary policy of central banks is a common determinant of stock liquidity. In particular, we examine the relationship between the European Central Bank's (ECB) monetary policy interventions and the liquidity of German, French and Italian stocks.

Interestingly, there are only few relevant theoretical approaches. The inventory paradigm of the market microstructure literature suggests that inventory turnover and inventory risk affect stock market liquidity.⁵ In a nutshell, this paradigm proposes that stocks are expected to be more liquid if market participants can cheaply finance their holdings and perceive low risk of holding assets. Since monetary policy influences both the costs of financing and the perceived risk of holding securities, it follows that monetary policy should also affect stock market liquidity. Similarly, Brunnermeier and Pedersen (2009) develop a model that addresses the interaction between funding liquidity and asset liquidity. Their model suggests that traders who face capital constraints experience difficulties to meet margin requirements and therefore fail to provide liquidity to the market. The other way around, a deterioration of market liquidity reduces traders' funding liquidity through higher margin requirements. This may lead to a loss spiral and a lower liquidity, higher margin equilibrium. Following this reasoning, an expansionary (restrictive) monetary policy eases (exacerbates) constraints for margin borrowing and thus, facilitates (impedes) the funding liquidity of market participants. Another argument could be that both monetary policy as well as stock market liquidity are closely linked to business cycle movements. Thus, we could expect a considerable impact of monetary policy on stock liquidity, where the real economy might serve as the transmission channel.

Few academic studies empirically examine the relationship between monetary policy and aggregate stock liquidity, and their results are to some extent ambiguous. Goyenko and Ukhov (2009) document strong evidence for the U.S. market (NYSE and AMEX) that monetary policy predicts liquidity for the period from 1962 to 2003. A tightening of monetary policy, as indicated by positive shocks to the federal funds rate and negative shocks to non-borrowed reserves, is shown to decrease stock market liquidity. Moreover, the bond market seems to serve as a transmitter that forwards monetary policy shocks to the stock market. On the contrary, Chordia et al. (2005) report only modest predictive power of monetary policy for stock market liquidity. For a sample of NYSE traded stocks they find that an expansionary monetary policy is associated with a contemporaneous increase in aggregated liquidity only during periods of crisis. The authors measure monetary policy by means of net-borrowed reserves and the federal funds rate. Soederberg (2008) studies the influence of 14 macroeconomic variables on the market liquidity of three Scandinavian stock exchanges between 1993 and 2005 and also provides mixed evidence. He finds that the policy rate is able to predict market liquidity on the Copenhagen stock exchange, whereas broad money growth plays a major role on the Oslo stock exchange and short-term interest rates and mutual fund flows predict liquidity on the Stockholm stock exchange. However, no variable is able to forecast liquidity for all three exchanges. Similarly, Fujimoto (2003) studies the relationship between macroeconomic variables and liquidity for NYSE and AMEX stocks. For the period ranging from 1965 to 1982, a positive shock to non-borrowed reserves increases liquidity, whereas an increase in the federal funds rate decreases liquidity. However, for the period from 1983 to 2001, neither shocks to non-borrowed reserves nor to the federal funds rate are able to predict stock market liquidity.

We find that an expansionary (contractionary) monetary policy of the ECB leads to an increase (decrease) in the liquidity of stocks, which is in line with the main findings of Goyenko and Ukhov (2009). However, we observe this relationship not only at the macroeconomic level for aggregate liquidity by using vector autoregressive (VAR) models, but also at the microeconomic level for individual stocks by applying panel estimations. Contrary to earlier studies, we are able to report non-linear effects on the individual stock level, i.e. that the effect of monetary policy becomes weaker the higher the market capitalization of the traded stock. Noteworthy, our findings are robust for three different markets (Germany, France, and Italy), seven measures of (il)liquidity (capturing trading activity, price impact and transaction costs) and two variables of monetary policy (base money growth and the Euro Overnight Index Average (EONIA) interest rate).

We contribute to the existing literature in three ways. First of all, while previous research focuses primarily on the U.S. stock market and offers to some extent ambiguous results, this study investigates European data. The effect of monetary policy on stock market liquidity might differ between currency areas and across countries, particularly when taking the differences in the statutes and policy aims between central banks into account. We are not aware of any study analyzing in depth the impact of ECB monetary policy. Secondly, we extend the analysis of monetary policy and liquidity to the individual stock level. From a methodological point of view, the application of panel-fixed-effects gives much stronger evidence as some effects could be canceled out at an aggregated level due to (unobserved) heterogeneity among assets. Our panel approach controls implicitly even for unobserved time-invariant characteristics at the individual stock level. To our knowledge, this is the first study applying both panel and VAR models to this specific research

¹ For a comprehensive overview of the literature about asset pricing and liquidity see Amihud et al. (2005).

² See Chordia et al. (2005), Hasbrouck and Seppi (2001) or Huberman and Halka (2001) for the U.S. and Kempf and Mayston (2008) for the German market.

³ See for example Pastor and Stambaugh (2003) and Acharya and Pedersen (2005).

⁴ Chordia et al. (2000) propose in their outline for future work on commonality in liquidity: "A sensible next step would attempt to identify specific macroeconomic influences that correlate with time series variation in liquidity."

⁵ Market microstructure theory deals with the determinants of the liquidity of individual stocks by focusing on stock characteristics and trade mechanisms. For an overview see O'Hara (1998) and Hasbrouck (2007).

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