

**Studienreihe der Stiftung Kreditwirtschaft
an der Universität Hohenheim**

Gerold Willershausen

European Sovereign Bond Liquidity and Central Bank Interventions



Verlag Wissenschaft & Praxis



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Preface

Since the global financial crisis the European Central Bank and other central banks have amended their operational frameworks and introduced new unconventional policies. These measures included direct purchases of securities such as government bonds. A growing strand of financial research investigates the liquidity in financial markets, which have shown high degrees of stress. The implications that can be derived from research on markets of European sovereign bonds are particularly valuable, as these markets play an important role in the European financial system.

This study contributes to the existing literature by investigating the liquidity of bond markets and analyzing the impact of unconventional policies. The empirical analysis finds positive returns from a liquidity supplying investment strategy in European bond market. The strategy performs particularly well during stress periods, when the funding becomes more costly and the inventory capacity of financial intermediaries declines.

Moreover, monetary policies that improve funding abilities of financial intermediaries and involve direct asset purchases can have a positive effect on market liquidity. Nevertheless, when considering emergency measures their short-term effectives should be balanced against the potential of distorting the incentives of market participants.

Hohenheim, March 2018

Prof. Dr. Hans-Peter Burghof

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List of Abbreviations

<i>AIC</i>	Akaike Information Criterion
<i>APP</i>	Asset Purchase Program
<i>AT</i>	Austria
<i>bps</i>	basis points
<i>BE</i>	Belgium
<i>BIS</i>	Bank of International Settlement
<i>BoE</i>	Bank of England
<i>BoJ</i>	Bank of Japan
<i>CAPM</i>	Capital Asset Pricing Model
<i>CDS</i>	Credit Default Swap
<i>CSD</i>	Central Securities Depository
<i>DE</i>	Germany
<i>ECB</i>	European Central Bank
<i>EMU</i>	European Monetary Union
<i>EONIA</i>	Euro Overnight Index Average
<i>ES</i>	Spain
<i>EUR</i>	Euro
<i>EURIBOR</i>	Euro Interbank Offered Rate
<i>FED</i>	Federal Reserve
<i>FI</i>	Finland
<i>FR</i>	France
<i>FRFA</i>	Fixed-Rate Full Allotment
<i>GDP</i>	Gross Domestic Product
<i>IE</i>	Ireland
<i>IT</i>	Italy
<i>KfW</i>	Kreditanstalt für Wiederaufbau

<i>LLR</i>	Lender of Last Resort
<i>LTCM</i>	Long Term Capital Management
<i>LTRO</i>	Long Term Refinancing Operation
<i>MiFID</i>	Markets in Financial Instruments Directive
<i>MiFIR</i>	Markets in Financial Instruments Regulation
<i>MMLR</i>	Market Maker of Last Resort
<i>MRO</i>	Main Refinancing Operations
<i>MTS</i>	Mercato Telematico dei Titoli di Stato
<i>NL</i>	The Netherlands
<i>NYSE</i>	New York Stock Exchange
<i>OIS</i>	Overnight Index Swap
<i>OMT</i>	Outright Monetary Transactions
<i>OTC</i>	Over-the-Counter
<i>PT</i>	Portugal
<i>PTF</i>	Principal Trading Firm
<i>QE</i>	Quantitative Easing
<i>SI</i>	Slovenia
<i>SMP</i>	Securities Market Program
<i>TARGET</i>	Trans-European Automated Real-time Gross settlement Express Transfer system
<i>TRACE</i>	Trade Reporting and Compliance Engine
<i>tr</i>	trillion
<i>VAR</i>	Vector Autoregression
<i>VIX</i>	US Volatility Index of the Standard&Poor's 500 Index
<i>VSTOXX</i>	European Volatility Index of the EURO STOXX 50 Index

Chapter 1

Introduction

1.1 Motivation

Not long ago, European government bond markets used to be of interest only for specialized portfolio managers or central bankers. Recently, these markets have gained the attention of policy makers and the broader public. For instance, during the European debt crisis, politicians criticized speculation for driving up bond yields and worsening funding conditions of liquidity-constrained sovereigns. In particular, the surge in the spread of peripheral countries against Germany as a benchmark has been closely followed by the public. A development that some may argue is not based on fundamental evaluation, given its magnitude and speed. Did the narrow corridor of bond prices before the financial turmoil reflect something else? A potential candidate is the faulty assumption of investors that the European Monetary Union (EMU) would convert into a transfer union. Often neglected in this debate are frictions in bond markets, which begin to matter under severe circumstances. Indeed, illiquidity in financial markets, which influences the costs of transacting, among other things, has surged unevenly and strongly during this episode.

Against this backdrop, the European Central Bank (ECB) directly intervened in these markets under newly developed policy programs. The

securities market program (SMP) was the first instance of direct purchases of government debt. To date, its successor the Outright Monetary Transactions (OMT) has not been implemented. Recently, the Asset Purchase Program (APP) followed these initiatives, and it is expected to be in place until the end of 2017. Previous studies on unconventional policies of major central banks are concerned with the influence on asset prices. For instance, existing evidence supports the conclusion that asset purchases by the Federal Reserve (FED) have successfully reduced bond yields.¹ Nevertheless, the communicated goal for purchasing sovereign bonds under the SMP/OMT program is to address the dysfunctionality in bond markets.² These efforts are due to the fact that European bonds are heterogeneous with respect to their credit risk and illiquidity, which is much in contrast to US treasury markets. Hence, the liquidity in some markets has appeared to be severely impaired, which may result in a deviation in observable prices from the underlying evaluation.

To explain the strong differences in market conditions during times with low trading costs and abundant liquidity and periods of market stress, a topical body of research investigates the supply by liquidity providers. Further, studies analyze the demand for liquidity by investors. Most of the existing evidence is provided for equity markets, which are organized differently from bond markets.³ For example, in bond markets the prevailing type of investor is institutions, such as insurance companies or pensions funds. Moreover, the market structure is more opaque than for equities, particularly for voice-trading in over-the-counter (OTC) markets. Further, pan-European electronic platforms market it possible to trade the bonds of many issuers in a single venue; however, pre- and post-trade arrangement are far from perfectly harmonized. In the near future, the supply side of bond markets will likely be subject to noticeable changes. The regulation under MiFID II is targeted to increase transparency in this market, which favors the trend of increased trading on electronic venues. In this context,

¹ See Krishnamurthy and Vissing-Jorgensen (2011) and D'Amico and King (2013).

² The official press release refers to liquidity and depth in government bond markets. <https://www.ecb.europa.eu/press/pr/date/2010/html/pr100510.en.html>

³ A growing number of studies provide evidence on US corporate bond markets. See Schestag et al. (2016) for a study on measuring bond liquidity. For studies on the pricing of bond liquidity see Bao et al. (2011) and Acharya et al. (2013).

new agents with automated trading strategies may become more important with the chance of lower transaction costs for investors. This thesis aims to provide a better understanding of European bond markets by contributing to the related issues of market liquidity and central bank interventions.

1.2 Research Outline

In the first part of the empirical analysis, I investigate the supply of liquidity in bond markets. For institutional investors with high trading needs, a decline in liquidity supply may result in large costs of trade execution. Moreover, evaporating liquidity supply can cause extreme price movements or market glitches. For instance, on October 15, 2014 10-year US treasury bonds experienced strong intraday price movements, which were accompanied by deteriorated liquidity conditions (Joint Staff Report, 2015). Previous empirical research mostly investigates liquidity supply in equity markets (Hendershott and Seasholes, 2014; Nagel, 2012). For treasury bonds, Green (2004) finds negative returns from liquidity supply around news. In European bond markets, primary dealers largely contribute to the liquidity in secondary markets. Recently, anecdotal evidence indicates that primary dealers have stopped their liquidity supplying service in some bond markets due to increasing costs and regulatory requirements.⁴ I contribute to the discussion with the following research question:

Research Question 1: What are the returns from supplying liquidity in European bond markets?

To investigate the issue, I construct a simple short-term contrarian trading strategy to proxy the trading behavior of liquidity suppliers. Trading in the opposite direction of the current price movement is profitable if prices are negatively correlated over time. If fewer liquidity suppliers are in the market, prices will deviate further from the fundamental value, and the return reversal strategy becomes more profitable. I empirically investigate whether short-term reversals are associated with illiquidity in bond

⁴ At the beginning of 2016 several primary dealers are reported to end their activities in European markets. For instance, see Reuters on January 21, 2016: “Squeeze bank dealers quit European government bond markets.”.