

# Safe Asset Scarcity and Monetary Policy Transmission \*

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## Abstract

Most central banks exited their decade-long accommodative monetary policy cycle by first raising rates, rather than starting by reducing their balance sheet. We show that the scarcity of government bonds—which were purchased under QE and held by central banks—reduces the transmission of rate hikes to money market rates. In July 2022, when the ECB increased its policy rates by 50bp for the first time in a decade, rates of repo transactions collateralized by the scarcest bonds increased by only 30bp. We show that this imperfect pass-through to repo rates is priced in treasury yields. Heterogeneous bond holdings across institutions imply that collateralized funding costs vary significantly across European institutions.

**JEL Classification Codes:** E51; E52; E58; G21.

**Keywords:** Monetary policy; repo market; safe assets; quantitative easing; ECB.

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# 1 Introduction

*The Eurosystem’s outright holdings of euro area sovereign bonds currently amount to more than a third of the outstanding market (...) As a result, the “scarcity premium” that market participants must pay to obtain these assets has often been considerable, both in the repo and the bond market (...) Such asset scarcity can delay, or even impair, the transmission of monetary policy [and] implies that sovereign yields in the euro area’s largest economy remain more accommodative than intended by our policy stance.*

—Isabel Schnabel, Member of the Executive Board of the ECB, Money Market Contact Group meeting, Frankfurt am Main, 2 March 2023

In the last 15 years, the expansion of central banks’ balance sheet went hand-to-hand with low interest rates. Most central banks decided to exit these accommodative monetary policies by hiking interest rates before shrinking their balance sheets. Under this sequencing, “quantitative tightening” occurs only after policy rates have been increased substantially.<sup>1</sup>

The recent experience, however, suggests that the choice of the sequencing of tightening measures is not trivial, in terms of its impact on the transmission of monetary policy. On July 27, 2022 the Eurosystem increased its policy rates by 50bp, the first hike since 2011 (Figure 1). The pass-through of this rate hike to money markets, however, was imperfect. While unsecured market rates increased one-to-one with the change in policy rates, the largest segment of the money market—the repo market— was sluggish, missing the target by more than 10 basis points, or 20% of the increase.

In this paper, we show that the main driver of this imperfect pass-through of monetary policy to money market rates is the safe asset scarcity that was partly the result of the ECB’s QE. We characterize safe asset scarcity by looking at bonds’ “specialness premium”, the spread between the repo rate quoted for a specific bond and the risk-free rate. The specialness phenomenon was initially characterized by Duffie (1996), who identified it in the context of the US debt issuance cycle. However, it has become a structural feature of the Euro-Area money market, and is far from restricted to on-the-run sovereign bonds: in July 2022, for example, more than 80% of sovereign debt traded on special.

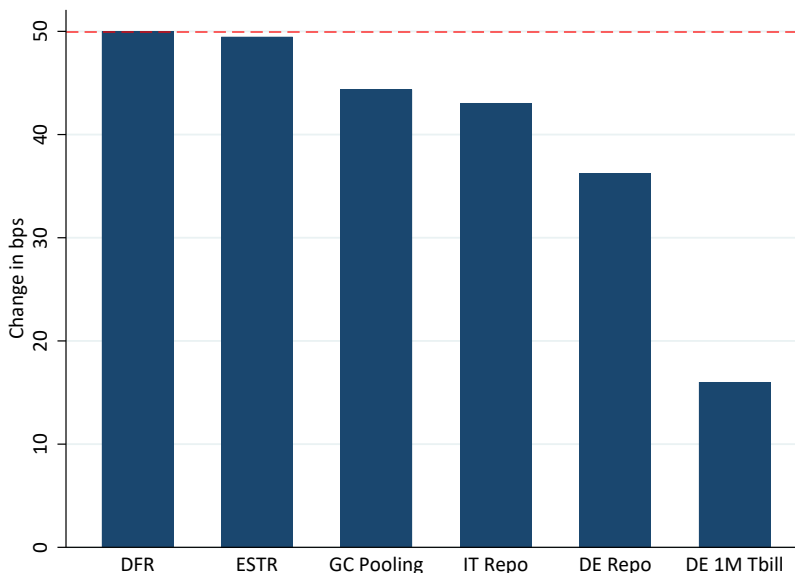
Using transaction-by-transaction data from the repo market, we show that contracts backed by bonds with the lowest repo rate, i.e., by the most special bonds, experienced the lowest pass-through. In other words, market participants that owned a very scarce bond and used

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<sup>1</sup>“Our normalisation process entails a sequence whereby interest rate increases precede the reduction in our balance sheet”, Pablo Hernández de Cos, member of ECB Governing Council. See also “Lagarde Says ECB Will Debate QT Once It Has Normalized Rates”, Bloomberg, 26 September 2022.

**Figure 1. Pass-through of money market rates for the July 2022 rate hike**

The bars show the change between the 5-day average before and after the ECB rate hike by 50bp on July 27, 2022. For DFR, ESTR, GC Pooling and Repo rates, we use the relevant implementation dates. For Tbill, we use the announcement date. Repo rates are computed as the volume-weighted repo rates using transactions settled at DFR-5bps and below, ie. below the GC Pooling rate. GC Pooling is against the extended GC basket, from Eurex.



it as collateral to borrow cash saw their borrowing cost increase by less than the change in the main monetary policy rate, contrary to what was experienced by a market participant pledging a widely-available bond.

We trace the source of a bond’s specialness to the bond scarcity that resulted from the central bank’s QE programs. The fraction of a bond’s amount outstanding held by the central bank precisely and persistently predicts that bond’s specialness rate and, thus, the extent to which a change in policy rate is passed-through to money market transactions involving that bond. Figure 2 illustrates our main finding: when the central bank increased their policy rate by 50bp in July 2022, the degree to which the rate was reflected in a loan collateralized by a given security depended on the how scarce the central bank purchases had made that security—as measured in December 2021.

We show that scarcity on the repo market has real effects on bond market prices and funding rates. First, since investors value owning a bond that allows them to borrow cheaply, yields of bonds that are scarce on the repo market declined more around the rate hike compared

## Figure 2. Pass-through fraction by QE purchase quantities

This figure shows the relation between the pass-through of the July 2022 interest rate hike for a given bond and the fraction of that bond’s amount outstanding that had been purchased by the ECB in its QE efforts. The pass-through is defined as the change in the rate at which a trader could borrow using a specific asset as collateral—its special repo rate. The rate change is scaled by the increase in monetary policy rate. The plot is a bin-scatter plot, showing the aggregated holdings and pass-through rates of 357 securities issued by Germany, France, Italy, and Spain. We do not show labels for the x-axis as statistics the ECB’s holdings at the bond-level are confidential.

to bonds that are not scarce. Second, by employing data on bond holdings, we show that the the rate hike had heterogeneous effects on the funding cost of European institutions: Following the 50bp hike, the average funding rates for a country’s banks increased by 46bp, while for the banks located in another country it increased by only 41bp, owing to the composition of the banks’ sovereign bond portfolios.

The heterogeneity in the pass-through to money market rates stems from varying elasticity of supply of the bonds’ holders on the repo market. As interest rates rise, the demand for safe and money-like assets rises (Nagel, 2016). As the demand for repos rises, repo rates increase less than one-for-one with other interest rates (unsecured rates, the central bank deposit facility rates, etc.) We show that scarcer bonds are held by investors whose elasticity to the repo rate is lower.

Our paper is the first to link the demand for safe assets to repo rates and the ability of central banks to tighten monetary policy. At the current juncture, the decision of engaging in tightening conventional monetary policy separately from Quantitative Tightening (QT) creates a tension between the rate policy and the size of the balance sheet, and concurs to

a higher dispersion of repo rates and yields. Our analysis implies clear policy recommendations: in the context of rising interest rates, a central bank may increase the provision of safe assets to the markets to transmit better its monetary policy. To this end, the Eurosystem has several tools, for instance ramping up its securities lending facility, by changing its limits in terms of quantity or by making its pricing more favourable.

The remainder of this paper is organized as follows. Section 2 details our contribution to the literature. Section 3 describes the institutional environment of the euro area money markets, how it is affected by monetary policy and the lack of safe assets. Section 4 details our empirical analysis. We offer policy implications in Section 5.

## 2 Literature Review

Our paper relates to three strands of literature. First, our paper relates to the body of work investigating how well a central bank can control short-term interest rates in an environment when its balance sheet is large. Many papers including by [Bech and Klee \(2011\)](#), [Frost, Logan, Martin, McCabe, Natalucci, and Remache \(2015\)](#) and [Copeland, Duffie, and Yang \(2021\)](#) have investigated the matter in the US since 2008 and showed that such control is more difficult than one would have anticipated, suggesting that the Fed should introduce new tools to ensure a smooth transmission of its interest rate hikes ([Bech and Klee, 2011](#)). In the case of the euro area, papers have shown that money market rates may fluctuate within the central bank corridor ([Vari, 2020](#)) and even fall below due to asset purchases ([Arrata, Nguyen, Rahmouni-Rousseau, and Vari, 2020](#)). [Eisenschmidt, Ma, and Zhang \(2022\)](#) show that competition in the money market has reduced monetary policy pass-through in a context of rate cut. [Ballensiefen, Ranaldo, and Winterberg \(2020\)](#) show that differentiated access to the remuneration of reserves at the central bank and bond eligibility to QE participate to disconnect the repo rates of collateral-driven vs cash-driven transactions. Our paper is the first to document that policy rate hikes are imperfectly transmitted as a consequence of safe asset scarcity.

Second, our paper deal with the specialness premium quoted on the repo market ([Duffie, 1996](#); [Krishnamurthy, 2002](#)), specifically in how it is affected by monetary policy ([Arrata, Nguyen, Rahmouni-Rousseau, and Vari, 2020](#); [Corradin and Maddaloni, 2020](#); [Pelizzon, Subrahmanyam, Tomio, and Uno, 2018](#)). We show that contrary to US, in the Euro-Area all bonds are special and that specialness reduces the interest rate pass-through.

Thirst, we also contribute more broadly to the literature on the demand for safe assets ([Krishnamurthy and Vissing-Jorgensen, 2012](#); [Greenwood, Hanson, and Stein, 2015](#)). [Nagel](#)

(2016) shows that demand for short-term safe investment engenders a premium, in particular for short-term Treasuries. Greenwood, Hanson, and Stein (2015) and Caballero, Farhi, and Gourinchas (2017) stress the adverse financial stability and macroeconomic effects of a lack of safe assets. We contribute to this literature by showing the interaction of safe asset scarcity and monetary policy.

### 3 Tightening Monetary Policy in Times of Safe Asset Scarcity

In this section, we briefly describe the repo market, elaborate on the effect that QE had on the price of collateralized lending,

The secured borrowing market is the main source of funding for European investors, with a daily turnover of around €400bn, dwarfing the market for unsecured borrowing and lending, which averages €125bn of daily transactions. We report quarterly average daily volume for the two market segments in Figure 3. Even when broadening money markets to include derivative transactions such as overnight interest rate swaps and foreign exchange swaps, the euro area repo market has become the predominant form of short-term trading, representing almost 56% of total money market turnover (ECB, 2022). The repo market comprises two segments, the market for General Collateral (GC), where the cash borrower can deliver any bond from a list of eligible securities, and the market for Specific Collateral (SC), where they can deliver a single security.

The largest end-users in these markets are mutual funds, insurance companies, pension funds, and money market funds, yet the net positions of banks and CCPs (which are often banks) are several order of magnitudes larger than the other counterparties, thanks to their role as dealers.

#### 3.1 The impact of central bank asset purchases on the repo market

Since 2015, bond repo rates have declined substantially below the deposit facility rate (Figure 4), a timing that coincided with the Eurosystem foray into large-scale asset purchases. In fact, as the Public Sector Purchase Program (PSPP) and the Pandemic Emergency Purchase Programme (PEPP) started in 2015 and 2020 respectively, the percentage of bonds trading “on specials” increased dramatically and reached 100% in 2015 and 2022 for Germany, and 50% and 100% for Italy (other countries follow similar patterns), as shown in