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## What drives the liquidity of sovereign bonds when markets are under stress? An assessment of the new Basel 3 rules on bank liquid assets<sup>☆</sup>

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### ABSTRACT

The new rules on bank liquidity set by the Basel Committee require banks to hold high-quality liquid assets (HQLAs) against future cash outflows in periods of market stress. Domestic government bonds are considered to be HQLAs. To assess the appropriateness of this rule, we investigate the liquidity of European government bonds in ordinary times and in periods of market turmoil. We find that the effect of adverse market conditions on liquidity strongly depends on individual bond's characteristics. Our evidence argues for rules on HQLAs that should constrain the eligibility of government bonds depending on their characteristics (primarily, duration and rating).

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### 1. Introduction

The new liquidity rules recently agreed by the [Basel Committee on Banking Supervision \(2013\)](#) and the [European Parliament and European Council \(2013a,b\)](#) – as part of a large regulatory reform known as Basel 3 – require that banks hold a buffer of “high-quality liquid assets” (HQLAs) to withstand future liquidity shocks (the “liquidity buffer”).<sup>1</sup> While improving the resilience of the bank-

ing sector, this requirement involves considerable adjustment costs for lenders ([Banking Stakeholder Group, 2012](#)) and might trigger a drop in credit supply to the real economy. It is therefore important that the new rules are carefully designed to effectively protect banks against systemic liquidity crises while minimizing the risk of negative side effects. For this reason, liquid assets must be defined in a way that mitigates the risk of market distortions, such as driving investment flows away from the banking sector or introducing regulatory-driven segmentations in secondary markets.

The Basel Committee has designed a set of criteria to assess which financial securities will be eligible as HQLAs. These criteria include credit rating, issuer type,<sup>2</sup> and maximum price changes over a 30-day period. Most asset classes are also subject to concentration limits.<sup>3</sup> Curiously enough, however, the eligibility requirements imposed on government bonds look rather loose. Namely, foreign Treasuries meeting a minimum rating threshold are subject to no further eligibility criteria (regarding, e.g., the duration, age, or issued amounts) and, most strikingly, domestic

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<sup>1</sup> Banks might also get secured funding from the central bank by pledging eligible securities as collateral in repo deals. However, this option would not alter the actual liquidity of bank assets.

<sup>2</sup> For example, most bonds issued by banks are excluded.

<sup>3</sup> For example, high quality mortgage-based securities will not be allowed to exceed 15% of the total liquidity buffer.

government bonds are subject to *no eligibility requirements at all*. Additionally, while some concentration limits exist for HQLAs, they do not apply to domestic government bonds. In fact, according to Basel 3 regulation, domestic Treasuries can represent up to 100% of a bank's liquidity buffer.<sup>4</sup> This provision reinforces the importance of investigating the liquidity of government bond in times of market turmoil.

The motivation for our paper is therefore the following: We intend to examine the soundness of the decision to treat all domestic Treasury bonds (and foreign bonds meeting a minimum rating threshold) as highly liquid, even in times of market stress,<sup>5</sup> for the purposes of liquidity risk regulation. This seems a nontrivial issue, especially in the Eurozone, where the national governments have handed over their monetary policy powers to the European Central Bank (ECB) and can no longer use seigniorage to fund public deficits and thus ensure that all their bonds will always be paid back. Consequently, confidence crises can occur (and have occurred) in the secondary market for Eurozone government bonds. In such cases investors quickly dispose of the securities issued by one or more sovereign states, leading to sudden price drops and liquidity shortages.

To assess whether government bonds can be trusted to be reasonably liquid in a stressed market environment, including a systemic shock, we investigate the liquidity of European government bond markets in ordinary times, as well as in periods of market turmoil.<sup>6</sup> Our sample period includes both the 2008 liquidity crisis (following the Lehman Brothers collapse) and the 2011 Eurozone sovereign crisis. We estimate different dimensions of liquidity (liquidity level, total liquidity risk, systematic liquidity risk, and liquidity commonality) using a data set of European government bonds traded in the MTS market, which is an electronic wholesale trading platform. We examine the cross-sectional relation between each liquidity dimension and a number of bond characteristics, controlling for market conditions. We also employ a robust illiquidity measure computed, using principal component analysis, as a combination of eight liquidity proxies. We find that liquidity is driven by both market factors (as the quality spread between BBB- and AAA-rated bond yields) and bond-specific factors (as duration, ratings, and size), and that the effect of adverse market conditions strongly depends on each bond's characteristics.

According to the Basel rules (Basel Committee on Banking Supervision, 2013, para. 25), liquid assets are of "high quality" if "their liquidity-generating capacity is assumed to remain intact even in periods of severe idiosyncratic and market stress". In principle, a security can generate liquidity through three different channels: (i) an outright sale on the secondary market (the "cash channel"); (ii) a repo with a private counterparty (the "private repo channel"); (iii) a refinancing operation with the central bank (the "central bank channel").

To assess the viability of the first channel, a number of market liquidity measures can be used: in this paper, we focus on the Amihud index (a widely used liquidity indicator that will be pre-

sented in detail below) while providing robustness tests based on a combination of different measures.

As concerns the second channel, a security used as underlying asset in a repo clearly needs not to be sold on the secondary market. Nevertheless, market liquidity still plays a crucial role in determining whether a private counterparty is willing to perform a repurchase transaction on that asset. Significant liquidity drops may make a security simply not eligible for repurchase agreements, as potential lenders anticipate that it could prove hard to sell if necessary. At the very least, illiquid securities will be subjected to higher haircuts, reducing their liquidity-generating potential. In this regard, it should be noticed that the Basel rules also define HQLAs as "assets that are more likely to generate funds without incurring large discounts in sale or repurchase agreement (repo) markets" (Basel Committee on Banking Supervision, 2013, para. 24). For these reasons, we believe that secondary market liquidity (i.e., liquidity in the "cash channel") also affects the ability of an asset to generate liquidity via the private repo channel.

The third channel is somewhat different, as central banks are free to accept highly illiquid assets in refinancing operations, and sometimes do (e.g., when unconventional policy measures are used to deal with severe market downturns). Accordingly, one may argue that – although market liquidity measures are relevant for the cash channel and the private repo channel – they should not affect an asset's eligibility as HQLA, since the "central bank channel" is prepared to provide liquidity under any circumstances.

However, the Basel rules explicitly state that, although central bank eligibility may "provide additional confidence that banks are holding assets that could be used in events of severe stress, [...] central bank eligibility does not by itself constitute the basis for the categorisation of an asset as HQLA" (Basel Committee on Banking Supervision, 2013, paras 26–27). In other words, access to the "central bank channel" is not enough, by itself, to secure the status of high-quality liquid asset. This is due to the fact that, while central banks may indeed be willing to broaden eligibility criteria in times of stress for financial stability reasons (on an *ex post* basis), they cannot preemptively commit to do so in the future (on an *ex ante* basis). Should they do so, this would lead to moral hazard behavior by banks, which would heavily invest in illiquid assets to gain the illiquidity premium (overlooking their liquidity equilibrium in exchange for short-term profits). This is even more true in the Eurozone, where the ECB enjoys an independent and supranational status that makes it not accountable to national parliaments and therefore less prone to political pressures. Accordingly, banks cannot blindly rely on the "central bank channel" and assume that securities experiencing severe liquidity disruptions will always qualify for central bank funding; this explains why such channel is explicitly ruled out by the Basel Committee. This reinforces the policy relevance of our study, suggesting that market liquidity should always be taken into account when assessing whether a security should qualify as HQLA.

The paper contributes to the existing literature in three ways. First, we provide a timely assessment of an important piece of bank regulation that addresses one of the most painful lessons learned at global level during the financial crisis (i.e., the need for detailed liquidity rules). Second, recent papers look at market liquidity during recent financial crises in the corporate bond (Dick-Nielsen et al., 2012; Friewald et al., 2012) and equity markets (Rösch and Kaserer, 2013). This paper fills the gap with respect to the government

<sup>4</sup> Paragraph 44 in of the Basel Committee on Banking Supervision (2013) states, "The stock of HQLA should be well diversified within the asset classes themselves (except for sovereign debt of the bank's home jurisdiction or from the jurisdiction in which the bank operates; central bank reserves; central bank debt securities; and cash)." Banks are therefore allowed to include in their liquidity buffer an unlimited amount of Treasuries issued by their own domestic governments.

<sup>5</sup> The Basel Committee explicitly requires that, in order to qualify as an HQLA, the asset should be liquid during a period of market stress (see paragraph 23 in Basel Committee on Banking Supervision, 2013).

<sup>6</sup> Our research design follows (Dick-Nielsen et al., 2012) who study the liquidity of the US corporate bond market before and after the onset of the US subprime crisis. However, whereas they investigate the liquidity component of the yield spread (i.e., the liquidity premium), we directly look at the determinants of liquidity measures.

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