



Domestic primary dealers' disclosure and peer banks' asset allocation decisions: Evidence from sovereign debt classification

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ABSTRACT

Primary dealers are sophisticated investors appointed by sovereign issuers to buy, promote, and distribute sovereign debt. They develop a deep knowledge of sovereign debt markets. This study examines domestic primary dealers' sovereign debt classification, which is presumed to reflect their superior information sets on expected sovereign yields. We hypothesize that when this classification is disclosed in financial statements, peer banks adjust their asset allocation accordingly. We first document the predictive ability of domestic primary dealers' sovereign debt classification for future sovereign yields. Next, using a sample of 6,437 bank-year observations over the 2012–2019 period and after controlling for publicly available information and other determinants of banks' asset allocation decisions, we show that peer banks divest financial instruments and increase loans when domestic primary dealers disclose more sovereign debt at amortised cost. These effects are more pronounced among peer banks facing greater informational disadvantages.

1. Introduction

We investigate whether and how the timely disclosure of domestic primary dealers' sovereign debt classification affects peer banks' asset allocation decisions. The core idea of this paper is that this classification reflects primary dealers' superior information sets regarding expected sovereign yields, and if disclosed in a timely manner, peer banks adapt investment and lending decisions accordingly. To the best of our knowledge, this question has not yet been addressed in the existing literature, although it has potentially relevant implications for market participants and the real economy. Sovereign yields are a cornerstone of capital markets, shaping interest rates and influencing real economic activity through channels such as bank lending. Given banks' role as intermediaries between demand and supply of credit, understanding how their decisions respond to new information is essential. Examining the spillover effects of domestic primary dealers' timely disclosure of

sovereign debt classification in financial statements offers novel insights into the ways such disclosures inform peer banks' lending behavior and contribute to market transparency.

Primary dealers are financial institutions appointed by sovereign issuers to buy, promote, and distribute sovereign debt. They are sophisticated investors that develop a deep knowledge of sovereign debt markets. Indeed, primary dealers contribute actively to the sovereign debt issuance choices, and provide reporting and advisory services to sovereign issuers. They follow closely the sovereign debt market, invest heavily in market research and – because of their role – develop timely information (Association for Financial Markets in Europe AFME, 2010; 2015; 2017; 2020).¹ This is especially true for domestic primary dealers, which play a central role in the sovereign debt issuance choices and are heavily exposed toward their own government (Burger and Warnock, 2003; Coeurdacier and Rey, 2013; Enria et al., 2016; Ongena et al., 2019). Therefore, consistent with prior literature, we focus on domestic

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¹ Primary dealers may also have access to confidential information. For example, “SVTs (Spécialistes en Valeurs du Trésor) [i.e. primary dealers] shall maintain confidentiality of the discussions at these meetings and shall refrain from making any disclosures to third parties. This information can be disseminated internally to the personnel directly concerned by the discussions, after notifying those persons of its confidential nature. AFT (Agence France Trésor) reserves the right to impose any penalty on a primary dealer that fails to comply with this requirement” (see AFME 2020 p.7.13). Similar confidentiality terms are explicitly included by other European sovereign issuers such as Greece, Italy, Netherlands, and the United Kingdom.

primary dealers which we collectively refer to as ‘dealers’ in this paper.

Sovereign debt refers to financial instruments such as bonds issued by and loans given to central and local government and governmental bodies. According to international accounting standards, dealers can classify sovereign debt either at amortised cost or at fair value in financial statements.² The sovereign debt classification entails a trade-off between liquidity and profitability. On the one hand, the amortised cost classification imposes liquidity costs on dealers by limiting their ability to sell the financial instrument, respond to market conditions, and fund loan demand (Meder, 2015; Chircop and Novotny-Farkas, 2016; Kim et al., 2019). On the other hand, it hedges against decreases in prices because fair value changes are not accounted in financial statements. It follows that the sovereign debt classification at amortised cost becomes optimal in case of rising interest rates (decreasing prices), and therefore it can be seen as an indicator of expected increases in yields.³

The adoption of European Securities and Markets Authority (ESMA) Public Statement 226/2011 (ESMA Recommendation), which expanded sovereign debt disclosures in financial statements, is our unique research setting.⁴ The ESMA Recommendation was adopted right after the 2011 European sovereign debt crisis ‘as a result of recently increased market interest in sovereign debt’ (p. 1). Its goal was to improve sovereign debt disclosures; however, dealers implemented it in different ways. As a result, in some countries dealers disclose sovereign debt exposures by country and by classification in financial statements (disclosing countries), while in other countries they do not provide such detailed information (non-disclosing countries). Non-disclosing dealers just provide aggregate sovereign debt exposures (such as the total sovereign debt at amortised cost) in their financial statements. The non-uniform implementation of the ESMA Recommendation allows us to investigate whether and how a timely disclosure of dealers’ sovereign debt classification affects peer banks’ asset allocation decisions. For both disclosing and non-disclosing dealers, we collect sovereign debt exposures by country and by classification from the European Banking Authority (EBA) exercises (stress tests, capital, and transparency exercises). These exercises are available for all dealers, however they are released to the public with an average delay close to eleven months.

Investors use sovereign yields as a baseline indicator of interest rates in many calculations (Sharpe, 1964; Fama and French, 1993, 1996). In typical valuation models, an increase in the interest rate mechanically leads to a reduction in the present value of financial assets. We predict that peer banks divest financial instruments when dealers timely reveal – through their disclosure of sovereign debt at amortised cost – that they expect rising yields.

² According to IFRS 9, financial instruments can be classified among three categories. First, the amortised cost category, which hedges against fair value changes (without impacts on the net income). Second, the fair value through other comprehensive income category, which includes fair value changes in the other comprehensive income section (with impacts on the equity). Third, the fair value through profit and loss category, which includes fair value changes in the income statement. IAS 39, the preceding accounting standard in place until 2017, allowed preparers to classify financial instruments in similar categories. Kvaal et al. (2023) examine banks’ classification behavior without documenting major changes after the adoption of IFRS 9. In the United States, FASB ASC Topic 320 also indicates three similar categories for the classification of debt securities.

³ The market value of sovereign debt is based on the present value of future payments, thus it is a function of the internal rate of return. Rising sovereign yields translate into lower prices and vice-versa.

⁴ See https://www.esma.europa.eu/sites/default/files/library/2015/11/2011_226.pdf. In the United States, dealers do not disclose sovereign debt exposures by country and by classification in financial statements. As a result, the lack of disclosure coupled with data constraints (the Federal Reserve stress tests do not provide this information) prevent us from using the United States as a setting. Neither we are aware of similar settings in Asia.

By decreasing the investment portfolio, peer banks free funds for other income-generating activities. Trade-offs between different types of investments are not new to the literature. For example, Haselmann et al. (2025) document that lending relationships inform banks’ proprietary trading, thus highlighting information exchanges and coordinated actions between different departments within a bank. Similarly, Bottero et al. (2020) find a negative association between financial instruments and loans, thus suggesting that the investment and loan portfolios are substitute asset allocation decisions. In this vein, peer banks are deemed to give new loans with the funds available from the divestiture of financial instruments (Kim et al., 2019). Therefore, we hypothesize that peer banks increase their loan portfolio when dealers hint – through their timely disclosure of sovereign debt at amortised cost – that they expect rising yields. This behaviour is likely to improve banks’ profitability because newly-issued loans are expected to generate higher positive interests. Indeed, European banks own in their portfolio a substantial amount of variable interest rate loans, whose positive interests are directly influenced by future sovereign yields.⁵

Our predictions are not free from tension. While on the one hand peer banks may use dealers’ sovereign debt classification as a trustworthy information source, on the other hand, they could simply discard it. Despite their deep knowledge of the sovereign debt market, someone could argue that dealers do not have any information advantages over other market participants. In this vein, the European sovereign debt market is a very deep and liquid market characterized by large trading volumes that improve its price discovery.⁶ Moreover, banks’ asset allocation decisions are based both on private beliefs (formed using internally developed information) and on social beliefs formed by observing other actors (external information) (Aymanns and Georg, 2015). The final course of action is the result of the weighting process of the two information sets, and peer banks could simply be biased toward their own internal information sources. In line with this possibility, the literature on ‘anchoring bias’ suggests that peer banks could fixate on their internal information during the weighting process (Kahneman et al., 1982). In sum, there is some tension in our predictions as different mechanisms could drive peer banks’ asset allocation decisions.

Our predictions are based on the assumption that domestic dealers’ sovereign debt classification at amortised cost reflects their superior information sets regarding expected yields. Consistently, we first examine whether this classification is indeed an indicator of future sovereign yields, after controlling for sovereign debt issuances and other sources of public information. We find that dealers’ sovereign debt classification at amortised cost is positively and significantly associated with future interest rates, thus confirming its predictive ability. In additional analyses, we find that dealers’ sovereign debt classification is an indicator of future sovereign yields in both disclosing and non-disclosing settings, thus ruling out the possibility that its predictive ability depends on a dealer’s disclosure regime. This mitigates potential self-selection concerns related to disclosing dealers. Moreover, we take a

⁵ Albertazzi et al. (2024) document that the majority of mortgages from Eurozone banks in the 2007-2015 period are adjustable rate mortgages. Figures from the European Central Bank (ECB) also confirm that the share of variable rate loans in total loans to households and non-financial corporations is above the 50% threshold in the majority of Eurozone countries. For example, as of December 2019, such percentage is equal to 73% in Italy and Spain (see <https://data.ecb.europa.eu/data/datasets/RAI/RAI.M.ES.SVLHHNFC.EUR.MIR.Z> and also <https://www.ft.com/content/5f06b680-d101-4d59-92e8-dba03ed4a98f>). Notably, banks’ funding costs only partly react to changes in sovereign yields. For example, according to S&P Global Ratings, the proportion of interest rates passed on to customers is equal to 20% in the Eurozone (see <https://www.ft.com/content/1d2949d6-00d1-4c18-af81-01439fa7cfc5>).

⁶ According to ESMA, the notional amount of the European sovereign debt market was equal to EUR 10 trillion in 2019. See <https://www.esma.europa.eu/press-news/esma-news/esma-publishes-first-overview-size-and-structure-eu-securities-markets>.

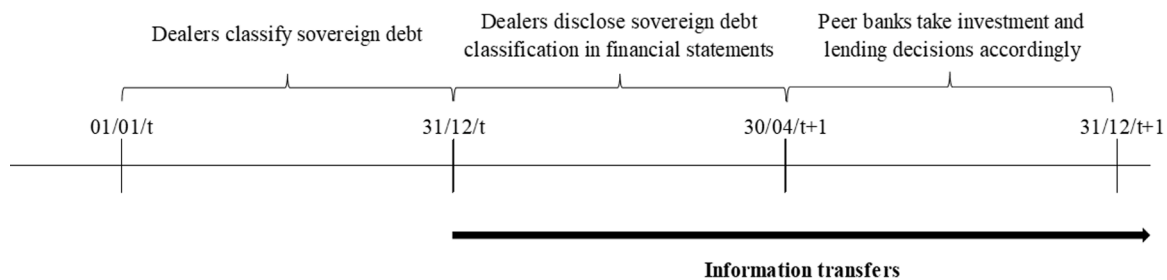


Fig. 1. Information transfers from dealers to peer banks.

closer look at a dealer's size. Consistent with the existing literature (De Marco et al., 2022), we use the size of sovereign debt portfolio as a proxy for a dealer's incentives to develop superior information sets. We do not observe major variations in the predictive ability of dealers' sovereign debt classification depending on size. These findings mitigate potential concerns that peer banks follow "large" banks rather than dealers. We also investigate the predictive ability of domestic non-dealers, foreign dealers, and foreign non-dealers, and find that only domestic dealers' sovereign debt classification at amortised cost is positively and significantly associated with future interest rates. Overall, our findings indicate there is indeed an information gap between domestic dealers and peer banks.

It is worth noting that, due to data constraints, we are unable to investigate the "sources" and the "nature" of dealers' superior information sets. Likely, these sources are various. Information could be developed in a formal setting or through a mosaic of informal interactions with State Treasury Agencies and/or other members of the network (Association for Financial Markets in Europe AFME, 2010, 2015, 2017, 2020), which are unobservable.⁷ It could be related to the size of sovereign debt exposures, which incentivize investments in market research (De Marco et al., 2022). Finally, in other settings, personal background and network can influence the level of available information sets (Sharma et al., 2022; Li et al., 2024; Xu, 2024). In this vein, societal ties of dealers' staff might play a role in shaping sovereign yield expectations. Similarly, data limitations impair our ability to investigate the "nature" of dealers' superior information sets. Sovereign yields are set in capital markets and are a function of unobservable determinants such as the equilibrium between demand and supply of credit, expectations for future short-term interest rates, which partly depend on inflation and growth rates, beliefs on future long-term interest rates and term premium, and assumptions on future sovereign debt issuance choices (see Kaufman, 1986 for a review). While we make some attempts to test possible channels, establishing the sources and nature of dealers' information sets remains a challenging task due to limited evidence on the information generation process.

Our sample consists of 6437 bank-year observations from 19 European countries over the 2012–2019 period, of which 48 % refer to disclosing countries. We define peers as all other domestic banks that do not act as dealers. We find that peer banks divest financial instruments and increase loans when dealers disclose in their financial statements more sovereign debt at amortised cost. Overall, our findings indicate that a timely disclosure of dealers' sovereign debt classification affects peer banks' asset allocation decisions in the year of the disclosure. These results are more pronounced among peer banks that have an information disadvantage.

Throughout our analyses, we include bank and year fixed effects to control for bank and time invariant characteristics, as well as control

variables for time-varying attributes. We control for the economic outlook of a country and other sources of public information by including variables such as current sovereign yield, change sovereign yield, forecast GDP, forecast sovereign yield, sovereign debt issuances, and unemployment rate. We also control for dealers' investment decisions in government securities as they are allowed to trade on their information sets.⁸

As shown in the predictability analysis, peer banks have reasons to rely on dealers' sovereign debt classification if it is disclosed in a timely manner. One might argue that, beside dealers' expectations, peer banks might use additional information sources such as economic forecasts, bond analysts and business journals that might be valuable in predicting future sovereign yields. We cannot rule out that these other sources are themselves using dealers' sovereign debt classification in making their own forecasts. However, the argument that alternative information sources might drive our findings is valid as long as such channels are available only in disclosing countries.⁹ We are not aware of information sources available exclusively in disclosing countries.

Our paper makes several contributions to the literature. First, using the unique setting of the non-uniform implementation of the ESMA Recommendation, we show that the timely disclosure of dealers'

⁸ It could be argued that the best way for dealers to "monetize" their superior information sets is through investment decisions in government securities rather than sovereign debt classification. However, dealers face some constraints in this regard. First, dealers shall actively participate in sovereign debt auctions, submit bids for a minimum amount which varies depending on sovereign issuers (see AFME 2020 for more details), act as market makers, and quote prices on the secondary market. Consistently, we document limited variation in dealers' sovereign debt exposures. Second, banks (including dealers) commonly invest funds available in government securities to lock in a net interest margin (Bowen, 1994; Argimon et al., 2018; Lamers et al., 2022). For example, in our sample, sovereign debt exposures are on average equal to 12 % of dealers' total assets. Due to such exposures, an erroneous sovereign debt classification could directly harm dealers' liquidity and profitability. Lastly, sovereign issuers could exercise some pressure on domestic banks to hold domestic exposures (Ongena et al., 2019), and dealers shall submit periodic performance reports to State Treasury Agencies (Association for Financial Markets in Europe AFME, 2010; 2015; 2017; 2020). Moreover, one might argue that peer banks can extrapolate dealers' superior information sets regarding expected yields by observing their trading patterns. However, we believe that this is unlikely for a number of reasons. First, it is not possible to isolate and disentangle dealers' superior information sets through prices that are set by the totality of market participants. In particular, dealers' proprietary trading is not observable and represents only a marginal fraction of the European sovereign debt market. As a result, prices do not exclusively capture dealers' superior information sets. Moreover, in our sample, the trading book is on average equal to 18 % of sovereign debt exposures, thus suggesting dealers' trading activity, even if it were observable, would provide only a limited picture about their interest rate expectations.

⁹ In fact, for an omitted variable to explain our results, it must capture contemporaneous changes in peer banks' asset allocation decisions, but only in disclosing countries.

⁷ See Dunne (2007) and Preunkert (2023) for a review of the primary dealership system.

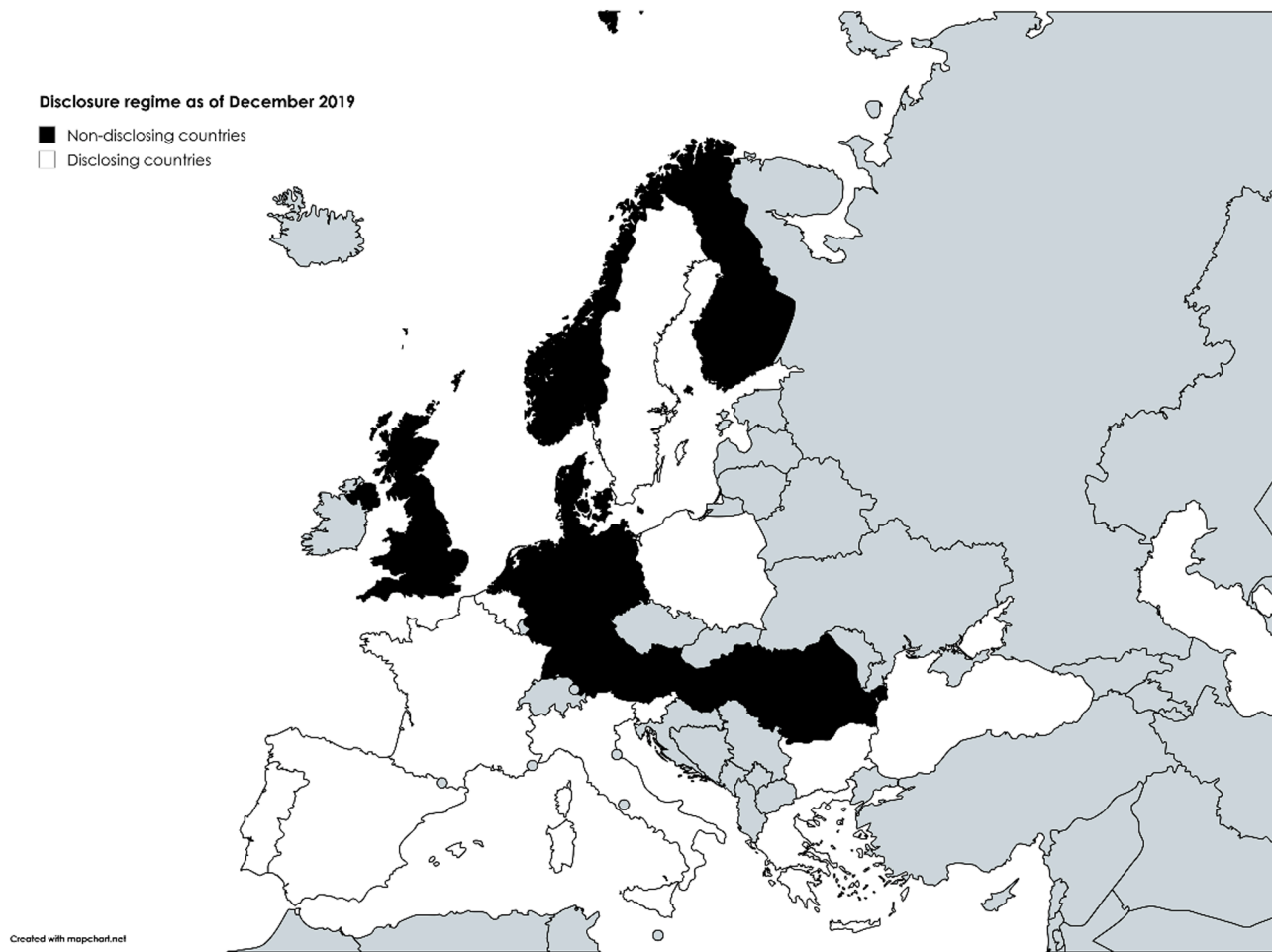


Fig. 2. Countries by disclosure regime.

sovereign debt classification at amortised cost affects peer banks' asset allocation decisions. Prior research only explores how the classification of financial instruments impacts a bank's own activities (Beatty, 1995; Hodder et al., 2002; Meder, 2015; Chircop and Novotny-Farkas, 2016; Argimon et al., 2018; Kim et al., 2019), or documents the effects of the 2011 European sovereign debt crisis on a bank's own loan portfolio (Popov and Van Horen, 2015; Acharya et al., 2018; De Marco, 2019). Our main innovation is showing that dealers' sovereign debt classification – if timely disclosed – affects peer banks' investment and lending decisions. Moreover, to our knowledge, we are the first to provide *prima facie* evidence on the information content of dealers' sovereign debt classification. By optimizing the trade-off between liquidity and profitability, this classification reveals dealers' superior information sets and becomes an indicator of future sovereign yields. We show that sovereign debt classifications are not merely accounting choices but also carry forward-looking information content. Since its timely disclosure affects peer banks' asset allocation decisions, we contribute to the ongoing debate on accounting standards regulating financial instruments (Plantin et al., 2008; Laux, 2016; Xie, 2016; Laux and Rauter, 2017). Third, previous empirical works on banks document that spillover

effects can occur from loan loss reserves announcements (Docking et al., 1997) and from sanctions by banking authorities (Caiazza et al., 2018). Similarly, mutual funds and insurers adopt imitative investment strategies when their holdings are periodically disclosed in portfolio filings (Frank et al., 2004; Verbeek and Wang, 2013; Hagenberg, 2024). We add to this stream of literature by focusing on dealers' sovereign debt classification rather than investment decisions, and by showing that spillover effects can also arise from the timely disclosure of this classification in financial statements.

The remainder of the paper is organized as follows. Sections 2 and 3 outline the literature review and setting. In Sections 4 and 5, we describe the sample and present our findings. In Section 6, we perform additional analyses. Section 7 contains robustness tests. We conclude in the last section.

2. Prior literature and hypothesis development

The idea that asset allocation decisions reflect information sets is not a new one in the existing literature (Khan and Ozel, 2016). In this vein, dealers are in a position to develop superior information sets regarding

Table 1

BvD Bankfocus sample.

Panel A: Distribution of observations by year						
This table presents the BvD Bankfocus sample. The sample consists of 6437 bank-year observations from 19 European countries over the 2012–2019 period. Panel A reports the distribution of observations by year. Panel B reports the distribution of observations by country. Panel C reports the descriptive statistics. Please refer to Appendix B for variable definitions and data sources.						
Year	Observations	%				
2012	429	7				
2013	451	7				
2014	1156	18				
2015	1268	19				
2016	1271	19				
2019	1862	29				
Total	6437	100				
Panel B: Distribution of observations by country						
This table presents the BvD Bankfocus sample. The sample consists of 6437 bank-year observations from 19 European countries over the 2012–2019 period. Panel A reports the distribution of observations by year. Panel B reports the distribution of observations by country. Panel C reports the descriptive statistics. Please refer to Appendix B for variable definitions and data sources.						
Country	Observations	%				
Austria	176	3				
Belgium	78	1				
Bulgaria	17	0				
Denmark	317	5				
Finland	208	3				
France	211	3				
Germany	1681	26				
Greece	11	0				
Hungary	34	1				
Italy	2055	32				
Netherlands	129	2				
Norway	509	8				
Poland	91	1				
Portugal	139	2				
Romania	16	0				
Slovenia	43	1				
Spain	165	3				
Sweden	290	5				
United Kingdom	267	4				
Total	6437	100				
Panel C: Descriptive statistics						
This table presents the BvD Bankfocus sample. The sample consists of 6437 bank-year observations from 19 European countries over the 2012–2019 period. Panel A reports the distribution of observations by year. Panel B reports the distribution of observations by country. Panel C reports the descriptive statistics. Please refer to Appendix B for variable definitions and data sources. All continuous variables are winsorized at the 1st and the 99th percentiles.						
Variable:	Obs.	Mean	Median	Sd	Min	Max
Independent variables						
Disclosure	6437	.4837657	0	.4997752	0	1
Classification	6437	-0.0074635	-0.0172334	.0941941	-0.3833476	.2366437
Classification#Disclosure	6437	.0001767	0	.0344663	-0.071951	.0778721
Dependent variables						
Securities	6437	.2190725	.195465	.1422868	.0002843	.6591913
Change securities	6437	.0105859	.00334	.0613485	-0.1752765	.2562888
Gross loans	6437	.6227355	.6481931	.1903849	.0532843	.9831015
Change gross loans	6437	.0312102	.0182466	.0867409	-0.1599141	.5146406
Controls bank-level						
Delinquency	6437	.0783319	.0407566	.0871521	.0002588	.4094842
Deposits	6437	.0468338	.0339213	.0882464	-0.1291977	.546562
Financial income	6437	.0024949	.0007772	.0043768	-0.0034102	.0249917
Regulatory capital	6437	.1763402	.156	.0901826	.0673	.6602
Size	6437	14.23572	13.90473	2.094024	10.58825	20.19275
Controls country-level						
Change equity index	6437	.0150602	.0265	.1513052	-0.252	.36234
Change exposure	6437	.0959582	-0.0111193	.8796971	-0.604863	8.379948
Change sovereign debt	6437	.0029531	-0.00086	.0331977	-0.04662	.09475
Change sovereign yield	6437	-0.3134635	-0.2066667	.9452089	-2.186666	2.417877
Change unemployment rate	6437	-0.1698198	-0.24	.7276348	-2.380001	2.29
Policy rate	6437	.1980426	.05	.3985047	-0.5	1.5
Sovereign yield	6437	2.002157	1.745698	1.512958	.3000802	6.61364
Forecast GDP	6437	1.486853	1.471227	.4664507	.5013	3.000065
Forecast sovereign yield	6437	1.444473	1.486547	1.327505	-0.2536345	5.492676

expected sovereign yields. Indeed, dealers are sophisticated investors that contribute actively to the sovereign debt issuance choices. Given their central role in the sovereign debt market, they develop expertise and invest heavily in research to monitor market trends and improve their predictive ability. The core idea of this paper is that dealers' sovereign debt classification reflects their superior information sets regarding expected yields, and can affect peer banks' asset allocation decisions if disclosed in a timely manner.

Dealers can classify sovereign debt either at amortised cost or at fair value in financial statements. The sovereign debt classification entails a trade-off between liquidity and profitability. On the one hand, the amortised cost classification imposes liquidity costs on dealers by limiting their ability to sell the financial instrument, respond to market conditions, and fund loan demand (Meder, 2015; Chircop and Novotny-Farkas, 2016; Kim et al., 2019).¹⁰ On the other hand, it hedges against decreases in prices because fair value changes are not accounted in financial statements. It follows that the sovereign debt classification at amortised cost becomes optimal in case of rising interest rates, and therefore it can be seen as an indicator of expected increases in yields.

Sovereign yields are widely used as indicators of interest rates (Sharpe, 1964; Fama and French, 1993, 1996). In typical valuation models, an increase in the interest rate mechanically leads to a reduction in the present value of financial assets. This is also confirmed empirically (Shiller and Beltratti, 1992; Baele et al., 2010, 2020). Dealers' sovereign debt classification at amortised cost hints at expected increases in yields. If this classification is timely disclosed, dealers' interest rate expectations are revealed to other market participants. We therefore predict that – based on dealers' sovereign debt classification – peer banks can anticipate increases in yields, and divest financial instruments in a timely manner. We formulate the following first hypothesis:

- (1) *When dealers disclose more sovereign debt at amortised cost, peer banks decrease their investment portfolio.*

The availability of funds imposes constraints during banks' capital planning processes. It follows that by divesting financial instruments, banks free funds for other income-generating activities. Prior literature suggests that information exchanges and coordinated actions can unfold between investment and lending decisions within a bank (Haselmann et al., 2025). Similarly, Kim et al. (2019) and Bottero et al. (2020) find a negative association between investment and loan portfolios, thus confirming that financial instruments and loans are substitute asset allocation decisions. Moreover, as dealers' sovereign debt classification at amortised cost hints at expected increases in yields, new loans are

deemed to incorporate such expectations and generate higher positive interests. Notably, European banks have a substantial amount of variable interest rate loans in their loan portfolio.¹¹ Therefore, if this classification is timely disclosed and shows more sovereign debt at amortised cost, we predict that peer banks will increase loans. We formulate the second hypothesis as follows:

- (2) *When dealers disclose more sovereign debt at amortised cost, peer banks increase their loan portfolio.*

While we argue that dealers' sovereign debt classification is unbiased,¹² our predictions are not free from tension, as different mechanisms could drive peer banks' behaviour. On the one hand, as hypothesized, peer banks could use dealers' sovereign debt classification as a trustworthy information source. On the other hand, they could simply discard it. In fact, despite their deep knowledge of the sovereign debt market, it could be argued that dealers do not have any superior information sets over other market participants. The European sovereign debt market is indeed very deep and liquid, characterized by large trading volumes and an efficient price discovery. Moreover, peer banks' asset allocation decisions are based on both private beliefs (formed using internally developed information) and on social beliefs formed by observing other actors (external information) (Aymanns and Georg, 2015). The final course of action is the result of the weighting process of the two information sets, and peer banks could simply be biased toward their own internal information sources. In line with this, the literature on 'anchoring bias' suggests that peer banks could fixate on their internal information during the weighting process (Kahneman et al., 1982).

3. Setting

We focus on domestic primary dealers because they are major actors in the domestic banking industry. Prior research documents the so-called 'home bias', namely the tendency of investors to overweight domestic assets (French and Poterba, 1991; Chan et al., 2005). This is also true for sovereign debt exposures (Burger and Warnock, 2003; Coeurdacier and Rey, 2013; Enria et al., 2016; Ongena et al., 2019). There is a small group of financial institutions acting as primary dealers for several sovereign issuers. Yet we decided to focus on domestic ones instead of international banking groups because the former are major actors on peer banks' relevant markets, and as such are more likely to be considered benchmarks. Moreover, as we show in the predictability analysis, foreign dealers' sovereign debt classification at amortised cost is not significantly associated with future interest rates, thus undermining peer banks' incentives to act upon it. If not otherwise specified,

¹⁰ We refer to classifications made at the time of the investment decisions in sovereign debt. One may argue that reclassifications may be a better indicator of dealers' expectations. However, according to IFRS 9, reclassifications of financial instruments are allowed if the business model of certain financial instruments changes, rendering the previous one obsolete. Since banks face high scrutiny coupled with several operational constraints, such reclassifications are exceptional events. More precisely, reclassifications are allowed only if the change in the business model of certain financial instruments is approved by a bank's investment committee according to its new strategic guidelines. As a result, reclassifications of financial instruments can be regarded as a one-off event. Similarly, IAS 39 also explicitly restricts the ability to reclassify financial instruments between categories. In particular, IAS 39 (AG22) states the only acceptable reasons to reclassify/sell financial instruments at amortised cost are: (a) Evidence of deterioration of the issuer's creditworthiness, (b) Tax law changes regarding the tax-exempt status of interest earned, (c) Major business combination, (d) Changes in regulatory or statutory environment regarding securities portfolio composition, (e) Increase in required regulatory capital, and (f) Increase in risk weights on debt securities used in risk-based capital. In sum, reclassifications of government securities are unlikely, therefore changes in the classifications are mainly driven by new investments in sovereign debt.

¹¹ Banks' funding costs only partly react to changes in sovereign yields. The deposit beta, which captures the sensibility of interests on deposits to yields, tends to be limited. According to S&P Global Ratings, the deposit beta is on average equal to 20% in the Eurozone, thus confirming that lenders are able not to pass the benefits of higher yields to depositors (see <https://www.ft.com/content/1d2949d6-00d1-4c18-af81-01439fa7cfc5>).

¹² One may question whether dealers have incentives to classify sovereign debt strategically in such a way as to fool peer banks. There are several reasons why this behaviour is unlikely. First, dealers have 'skin in the game'. An erroneous classification could directly harm dealers' liquidity and profitability. Sovereign debt exposures coupled with the trade-off of this classification provide incentives to make unbiased decisions. Second, sovereign issuers appoint and monitor dealers during their mandate. Dealers, in particular, have incentives to maintain their status and a strategic classification, if revealed, could harm their reputation. In this vein, we do not observe any changes in the status of dealers in our sample. Lastly, if dealers do act strategically when they classify sovereign debt, they can mislead and take advantage of peer banks, but only in the short-term. Instead, in the long-term, this behaviour is likely to entail a loss of credibility. In the light of these considerations, we do not expect dealers to gain major benefits from classifying sovereign debt strategically.

Table 2
EBA sample.

Panel A: Distribution of observations by year

This table presents the EBA sample. The sample consists of 408 domestic bank-year observations from 19 European countries over the 2012–2019 period. Panel A reports the distribution of observations by year. Panel B reports the distribution of observations by country. Panel C reports the descriptive statistics. Please refer to Appendix B for variable definitions and data sources.

Year	Observations	%
2011	53	13
2012	57	14
2013	61	15
2014	87	21
2015	50	12
2018	100	25
Total	408	100

Panel B: Distribution of observations by country

This table presents the EBA sample. The sample consists of 408 domestic bank-year observations from 19 European countries over the 2012–2019 period. Panel A reports the distribution of observations by year. Panel B reports the distribution of observations by country. Panel C reports the descriptive statistics. Please refer to Appendix B for variable definitions and data sources.

Country	Observations	%
Austria	17	4
Belgium	17	4
Bulgaria	1	0
Denmark	21	5
Finland	12	3
France	35	9
Germany	79	19
Greece	12	3
Hungary	6	1
Italy	43	11
Netherlands	27	7
Norway	7	2
Poland	7	2
Portugal	17	4
Romania	1	0
Slovenia	11	3
Spain	43	11
Sweden	26	6
United Kingdom	26	6
Total	408	100

Panel C: Descriptive statistics

This table presents the EBA sample. The sample consists of 408 domestic bank-year observations from 19 European countries over the 2012–2019 period. Panel A reports the distribution of observations by year. Panel B reports the distribution of observations by country. Panel C reports the descriptive statistics. Please refer to Appendix B for variable definitions and data sources. All continuous variables are winsorized at the 1st and the 99th percentiles.

Variable:	Obs.	Mean	Median	Sd	Min	Max
Independent variables						
Disclosure	408	.2696078	0	.4443009	0	1
Classification	408	.0413863	-0.0009671	.3620129	-0.6134174	2.550992
Classification#Disclosure	408	.0020901	0	.0652305	-0.2359732	.4575334
Dealer	408	.5637255	1	.4965313	0	1
Dependent variable						
Sovereign yield	408	1.55142	1.2132	1.728962	-0.3737903	8.603333
Controls country-level						
Change exposure	408	.088237	.0000852	.4521015	-0.604863	2.790608
Change sovereign debt	408	.0091666	.00281	.0465817	-0.13268	.16457
Change sovereign yield	408	-0.484342	-0.275252	1.07281	-3.759999	2.873334
Exposure	408	16.67479	16.91712	1.38326	11.09743	19.64635
Sovereign yield	408	2.25715	1.745698	2.0404	.3000802	11.03333
Forecast sovereign yield	408	2.439778	1.792083	2.047747	.396364	10.23917

when we use the term ‘dealers’ we refer to domestic primary dealers in this paper.

The adoption of European Securities and Markets Authority (ESMA) Public Statement 226/2011 (ESMA Recommendation), which expanded disclosures on sovereign debt in financial statements, is our unique research setting.¹³ Dealers implemented the ESMA Recommendation in different ways. As a result, in some countries, dealers disclose sovereign

debt exposures by country and by classification (disclosing countries) while in other countries they do not provide such detailed information (non-disclosing countries). Non-disclosing dealers usually provide aggregate sovereign debt exposures such as the total sovereign debt at amortised cost. The non-uniform implementation of the ESMA Recommendation allows us to investigate whether and how the timely disclosure of dealers’ sovereign debt classification affects peer banks’ asset

¹³ ESMA issued the Public Statement 397/2011 in November 2011 to further encourage sovereign debt disclosures in financial statements. See https://www.esma.europa.eu/sites/default/files/library/2015/11/2011_397.pdf.

Table 3

– Panel A predictability of sovereign yields.

This table reports the results of the predictability of sovereign yields analysis. Panel A reports the results for domestic banks. Panel B reports the results for foreign banks. Please refer to Appendix B for variable definitions and data sources. All continuous variables are winsorized at the 1st and the 99th percentiles. All regressions include country and year fixed effects. Standard errors are clustered at bank level (t-stat in brackets). ***, **, and * indicate statistical significance at the 1 %, 5 %, and 10 % two-tail levels, respectively.

Variable:	Sovereign yield i_{t+1}					
	(1)	(2)	(3)	(4)	(5)	(6)
Classification i_t	0.104 (1.43)	0.105 (1.36)	0.188* (1.85)	0.189* (1.74)	0.404 (1.42)	0.369 (1.31)
Change exposure i_t	-0.094 (-1.31)	-0.101 (-1.36)	-0.025 (-0.45)	-0.035 (-0.67)	-0.402 (-1.48)	-0.374 (-1.39)
Change sovereign debt i_t	0.762 (1.04)	-0.640 (-0.85)	-0.051 (-0.05)	-0.674 (-0.75)	1.513 (1.52)	-0.879 (-0.73)
Change sovereign yield i_t	-0.036 (-0.55)	0.127** (2.49)	0.070 (0.95)	0.170*** (3.15)	-0.179 (-1.66)	0.059 (0.57)
Sovereign yield i_t	0.726*** (19.98)	0.367** (2.50)	0.664*** (14.20)	0.442*** (2.88)	0.792*** (12.93)	0.270 (0.94)
Forecast sovereign yield i_t		0.374** (2.04)		0.224 (1.20)		0.553 (1.55)
Constant	-0.110 (-0.94)	-0.118 (-0.92)	0.140 (0.99)	0.144 (0.94)	-0.409** (-2.06)	-0.421* (-1.98)
Sample	All	All	Dealers	Dealers	Non-dealers	Non-dealers
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	408	408	230	230	178	178
Adjusted R-squared	0.9498	0.9508	0.9520	0.9523	0.9512	0.9525

Table 3 – Panel B Predictability of sovereign yields

Variable:	Sovereign yield i_{t+1}					
	(1)	(2)	(3)	(4)	(5)	(6)
Classification i_t	-0.135 (-0.22)	0.071 (0.10)	1.193 (0.97)	1.565 (1.28)	-0.365 (-0.49)	-0.149 (-0.18)
Change exposure i_t	0.114 (0.54)	0.101 (0.50)	-0.558 (-1.26)	-0.619 (-1.63)	0.227 (0.84)	0.193 (0.74)
Change sovereign debt i_t	-1.584*** (-10.70)	-2.209*** (-15.63)	-1.004*** (-4.04)	-1.655*** (-5.64)	-1.654*** (-9.94)	-2.262*** (-14.42)
Change sovereign yield i_t	0.130*** (25.56)	0.233*** (61.91)	0.143*** (7.84)	0.206*** (9.05)	0.129*** (20.29)	0.238*** (41.66)
Sovereign yield i_t	0.787*** (64.80)	0.418*** (42.96)	0.744*** (39.84)	0.476*** (11.38)	0.790*** (60.40)	0.412*** (33.81)
Forecast sovereign yield i_t		0.371*** (28.63)		0.251*** (7.92)		0.382*** (26.04)
Constant	-0.008 (-0.23)	-0.043 (-1.19)	0.101* (1.78)	0.124* (2.05)	-0.014 (-0.37)	-0.057 (-1.44)
Sample	All	All	Dealers	Dealers	Non-dealers	Non-dealers
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	8451	8451	772	772	7679	7679
Adjusted R-squared	0.9403	0.9449	0.9481	0.9501	0.9397	0.9445

This table reports the results of the predictability of sovereign yields analysis. Panel A reports the results for domestic banks. Panel B reports the results for foreign banks. Please refer to Appendix B for variable definitions and data sources. All continuous variables are winsorized at the 1st and the 99th percentiles. All regressions include country and year fixed effects. Standard errors are clustered at bank level (t-stat in brackets). ***, **, and * indicate statistical significance at the 1 %, 5 %, and 10 % two-tail levels, respectively.

allocation decisions. Fig. 1 illustrates our setting.

Since the ESMA Recommendation is non-binding, the content of sovereign debt disclosures is usually left to the individual dealer.¹⁴ We observe that dealers' decision to disclose sovereign debt exposures by country and by classification in financial statements is usually sticky.¹⁵ In our analysis, for every disclosing country, we use all disclosing dealers' sovereign debt classifications. We observe that the vast majority

¹⁴ As an exception, the Italian securities and markets authority (CONSOB) published the Communication DEM/11070007 in 2011 which requires listed banks to disclose sovereign debt exposures by country and by classification in financial statements. We are not aware of similar interventions by other securities and markets authorities.

¹⁵ Only two dealers started but subsequently stopped to provide such information (see Appendix A).

of dealers implemented the ESMA Recommendation in the same way within a specific country with only few exceptions, thus mitigating such concerns. In particular, we document in total only seven non-disclosing dealers in disclosing countries (see Appendix A). Moreover, as we show in the predictability analysis, dealers' sovereign debt classification is an indicator of future sovereign yields in both disclosing and non-disclosing settings, thus mitigating potential concerns that its predictive ability depends on the disclosure regime. In non-disclosing countries, we use all dealers' sovereign debt classifications taken from subsequent European Banking Authority (EBA) exercises, which become public with an average delay of eleven months. This process yields a pool of 50 dealers. A country has from one to eight dealers; the average number is two (2.6). Notably, we do not observe changes in the pool of dealers during our sample period. The list of dealers and the disclosure regime are provided in Appendix A.

Table 4

Predictability of sovereign yields by disclosure regime.

Variable:	Sovereign yield $_{i,t+1}$					
	(1)	(2)	(3)	(4)	(5)	(6)
Classification $_{i,t}$	0.100 (1.20)	0.100 (1.11)	0.186** (2.50)	0.184** (2.23)	0.411 (1.12)	0.376 (1.08)
Disclosure $_{i,t}$	-0.044 (-0.87)	-0.043 (-0.88)	-0.027 (-0.20)	-0.015 (-0.12)	-0.088 (-0.55)	-0.119 (-0.66)
Classification # Disclosure $_{i,t}$	0.110 (0.29)	0.138 (0.33)	0.017 (0.02)	0.039 (0.05)	0.063 (0.20)	0.090 (0.26)
Change exposure $_{i,t}$	-0.095 (-1.08)	-0.102 (-1.09)	-0.025 (-0.47)	-0.035 (-0.67)	-0.409 (-1.16)	-0.381 (-1.13)
Change sovereign debt $_{i,t}$	0.766 (0.56)	-0.644 (-0.64)	-0.040 (-0.04)	-0.672 (-0.66)	1.520 (0.95)	-0.968 (-0.69)
Change sovereign yield $_{i,t}$	-0.036 (-0.28)	0.127* (1.94)	0.070 (0.87)	0.170*** (2.95)	-0.180 (-1.08)	0.067 (0.69)
Sovereign yield $_{i,t}$	0.728*** (9.76)	0.368 (1.54)	0.664*** (11.81)	0.443** (2.80)	0.797*** (8.29)	0.255 (0.68)
Forecast sovereign yield $_{i,t}$		0.375 (1.18)		0.223 (1.18)		0.575 (1.19)
Constant	-0.104 (-0.46)	-0.112 (-0.46)	0.149 (0.91)	0.149 (0.85)	-0.408 (-1.35)	-0.421 (-1.36)
Sample	All	All	Dealers	Dealers	Non-dealers	Non-dealers
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	408	408	230	230	178	178
Adjusted R-squared	0.9496	0.9506	0.9515	0.9518	0.9507	0.9521

This table reports the results of the predictability of sovereign yields by disclosure regime. Please refer to Appendix B for variable definitions and data sources. All continuous variables are winsorized at the 1st and the 99th percentiles. All regressions include country and year fixed effects. Standard errors are clustered at bank level (t-stat in brackets). ***, **, and * indicate statistical significance at the 1 %, 5 %, and 10 % two-tail levels, respectively.

Table 5

Predictability of sovereign yields by size.

Variable:	Sovereign yield $_{i,t+1}$					
	(1)	(2)	(3)	(4)	(5)	(6)
Classification $_{i,t}$	0.108 (1.15)	0.111 (1.06)	0.221* (1.99)	0.226* (1.93)	0.416 (1.16)	0.381 (1.11)
Big $_{i,t}$	0.041 (1.70)	0.040 (1.61)	-0.020 (-0.65)	-0.023 (-0.75)	-0.012 (-0.22)	-0.026 (-0.54)
Classification # Big $_{i,t}$	-0.032 (-0.54)	-0.037 (-0.62)	-0.241 (-1.17)	-0.272 (-1.30)	-0.034 (-0.82)	-0.035 (-0.74)
Change exposure $_{i,t}$	-0.091 (-1.04)	-0.097 (-1.04)	-0.021 (-0.39)	-0.031 (-0.60)	-0.399 (-1.14)	-0.371 (-1.11)
Change sovereign debt $_{i,t}$	0.745 (0.54)	-0.658 (-0.65)	-0.096 (-0.09)	-0.748 (-0.76)	1.498 (0.96)	-0.915 (-0.65)
Change sovereign yield $_{i,t}$	-0.037 (-0.29)	0.126* (1.95)	0.071 (0.89)	0.175*** (3.00)	-0.178 (-1.07)	0.063 (0.61)
Sovereign yield $_{i,t}$	0.726*** (9.94)	0.367 (1.53)	0.665*** (12.93)	0.436** (2.75)	0.792*** (8.04)	0.265 (0.71)
Forecast sovereign yield $_{i,t}$		0.374 (1.18)		0.232 (1.24)		0.558 (1.16)
Constant	-0.121 (-0.52)	-0.129 (-0.51)	0.143 (0.93)	0.149 (0.92)	-0.405 (-1.25)	-0.413 (-1.25)
Sample	All	All	Dealers	Dealers	Non-dealers	Non-dealers
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	408	408	230	230	178	178
Adjusted R-squared	0.9496	0.9506	0.9516	0.9520	0.9506	0.9519

This table reports the results of the predictability of sovereign yields by size. Size category assignments use criteria based on the size of a bank's sovereign debt portfolio (below and above the top quartile). Please refer to Appendix B for variable definitions and data sources. All continuous variables are winsorized at the 1st and the 99th percentiles. All regressions include country and year fixed effects. Standard errors are clustered at bank level (t-stat in brackets). ***, **, and * indicate statistical significance at the 1 %, 5 %, and 10 % two-tail levels, respectively.

The list of countries whose dealers disclose sovereign debt exposures by country and by classification in financial statements (disclosing countries) includes Austria (until 2016), Belgium, Bulgaria, France (since 2014), Greece, Italy, Poland (since 2018), Portugal, Slovenia,

Spain, and Sweden (11/19 countries). In contrast, Denmark, Finland, Germany, Hungary, Netherlands, Norway, Romania, and the United Kingdom are non-disclosing countries (8/19 countries) because none of their dealers provides such detailed information in financial

statements.¹⁶ Fig. 2 depicts the distribution of countries by disclosure regime.¹⁷

We acknowledge that since the ESMA Recommendation is non-binding, the content of sovereign debt disclosures remains voluntary and is left to the single bank (see also Bischof and Daske, 2013, p. 3).¹⁸ Notably, our results indicate that the predictive ability of dealers' sovereign debt classification is not affected by the disclosure regime, thus mitigating potential self-selection of disclosing dealers.

4. Main variables, data, and sample

4.1. Main variables

We argue that dealers' sovereign debt classification reflects their superior information sets regarding expected yields. The overall investment in sovereign debt is not a univocal indicator, as the amortised cost and fair value classifications point to opposite directions. For example, the sovereign debt classification at amortised cost hints at expected increases in yields. Vice-versa, the sovereign debt classification at fair value suggests expected decreases in yields.

For the above reasons, we use the change in sovereign debt at amortised cost. *Classification* is defined as the change in domestic sovereign debt at amortised cost over lagged sovereign debt portfolio ((domestic sovereign debt at amortised cost t – domestic sovereign debt at amortised cost $t-1$)/sovereign debt $t-1$).¹⁹ The percentage of domestic sovereign debt at amortised cost is less informative than its change because this figure depends partly on past decisions. Dealers could have made this classification under one information set, and then subsequently updated their expectations. Dealers in fact cannot divest or

reclassify sovereign debt at amortised cost (see footnote 10) but they can classify newly-purchased government securities according to their updated information sets. As a result, the change in sovereign debt at amortised cost stems from the maturing of government securities classified at amortised cost coupled with the classification of newly-purchased sovereign debt in such category. Since data on newly-purchased and on maturing government securities are not available, the change in sovereign debt at amortised cost becomes the best proxy available.²⁰ *Classification* is defined at country-year level as the weighted average of dealers' classifications, where the weights refer to their domestic sovereign debt exposures. Dealers' classifications tend to be aligned and indicate the same interest rate direction in almost 80 % of the observations. Using total assets as weights, or the simple average together with domestic sovereign debt exposures as a control variable, yields similar results.

Classification is then interacted with the variable *Disclosure*, where the latter is equal to one in disclosing countries and zero otherwise. We define a country as disclosing if at least one of its dealers provides detailed sovereign debt exposures by country and by classification in financial statements. In non-disclosing countries, none of the dealers discloses such detailed information.

To test our predictions, we use the following dependent variables (Beatty, 1995; Chircop and Novotny-Farkas, 2016; Kim et al., 2019). *Change securities* captures the investment portfolio and is equal to the change in financial instruments over lagged total assets ((securities t – securities $t-1$)/total assets $t-1$). *Change gross loans* is defined as the change in gross customer loans scaled by lagged total assets ((gross loans t – gross loans $t-1$)/total assets $t-1$). Using net customer loans, which are defined as gross loans minus impairment charges, yields similar results. Similarly, using percentage changes in customer loans yields similar results. Please refer to Appendix B for detailed variable definitions.

4.2. Data

We merge data from different sources. First, for both disclosing and non-disclosing dealers we collect net sovereign debt exposures by country and by classification from European Banking Authority (EBA) exercises. EBA exercises (stress tests, capital, and transparency exercises) are released to the public with an average delay close to eleven months. As a result, their information content is arguably less timely than that of financial statements.²¹

EBA data are available only since 2011, therefore our sample period covers the years from 2012 to 2019.²² This data constraint impairs our ability to investigate the years before the adoption of the ESMA

¹⁶ Bulgarian and Romanian dealers are included in EBA exercises only since 2013 or 2017. Excluding these countries yields similar results. Moreover, Ireland is excluded because it does not have any dealers covered in EBA exercises. Finally, a few countries (Cyprus, Estonia, Luxembourg, and Malta) do not have sovereign debt markets organized with primary dealers and are therefore excluded. The non-uniform implementation of the ESMA Recommendation occurred in a staggered fashion. Most disclosing dealers started to do so in 2011, right after its adoption. However, French and Polish dealers have provided such detailed disclosures only since 2014 and 2018, respectively. Austria is the only country that switched from a disclosing to a non-disclosing regime in 2016. In an untabulated analysis, we restrict the sample to countries that do not change their disclosure regime during our sample period. We thus drop observations from Austria, France, and Poland, which represent 7% of the sample, finding similar results.

¹⁷ If we opted for retaining foreign dealers' sovereign debt classification, our setting with disclosing and non-disclosing countries would cease to exist because there would be disclosing foreign dealers in countries that were previously defined as non-disclosing. As a result, all countries would become disclosing.

¹⁸ The reason why some dealers might prefer not to disclose is because such disclosure could be costly for them. First, it might entail reputational costs. Investors and sovereign issuers could infer poor knowledge of the sovereign debt market from classifications that are not aligned with future sovereign yields. In this vein, reputational concerns could damage dealers' status. Second, disclosure might entail proprietary costs. As a reaction to the disclosure of dealers' sovereign debt classification, investors could force dealers to hold suboptimal sovereign debt exposures, thus potentially impairing dealers' profitability. For example, if disclosing dealers reveal rising sovereign yields, investors could divest government securities. However, all dealers, regardless of their disclosure regime, would be affected by such market reaction, which mitigates the impact of such proprietary costs. The non-uniform implementation of the ESMA Recommendation may be justified by these costs coupled with the different level of enforcement by national securities and markets authorities. As a result, the spectrum of dealers' sovereign debt disclosures ranges from detailed exposures by country and by classification to aggregate figures.

¹⁹ We also define *Classification* as the change over total assets or over domestic sovereign debt exposures, and find similar results. Results are not tabulated for parsimony.

²⁰ One may argue that the sovereign debt at amortised cost is mechanically driven by changes in the proportion at fair value, even without active decisions to classify government securities in such category. By scaling the change in domestic sovereign debt at amortised cost over *lagged sovereign debt portfolio*, changes in fair value do not mechanically influence *Classification*, thus mitigating such concern.

²¹ Most EBA exercises contains two different data points. For example, the 2015 EBA transparency exercise contains sovereign debt exposures by country and by classification at the 31st of December 2014 and at the 30th of June 2015. It could be argued that the information content of EBA exercises might influence peer banks' asset allocation decisions in the period between the release date and the fiscal year end. Notably, in cases of EBA exercises with two data points, the average delay is close to eleven months with a release date usually in December. In a robustness test, we examine whether peer banks adapt their asset allocation decisions after the release of EBA exercises. To avoid confounding effects of sovereign debt disclosures in financial statements, this test is limited to non-disclosing countries. We do not find significant results, suggesting that peer banks tend not to incorporate the information content of EBA exercises, likely due to its lack of timeliness (see Table 10).

²² From January 2016 until December 2017, EBA exercises did not provide sovereign debt exposures by country and by classification.

Table 6
Investment portfolio.

Variable:	Change securities i,t	
	(1)	(2)
Classification#Disclosure $i,t-1$	-0.130*** (-4.43)	-0.108*** (-3.19)
Classification $i,t-1$	0.016 (1.65)	0.014 (1.34)
Disclosure $i,t-1$	0.005 (0.72)	0.005 (0.70)
Delinquency $i,t-1$	0.079** (2.13)	0.081** (2.16)
Deposits i,t	0.231*** (13.70)	0.232*** (13.71)
Financial income i,t	0.665 (1.39)	0.688 (1.44)
Gross loans $i,t-1$	-0.126*** (-5.23)	-0.125*** (-5.19)
Regulatory capital $i,t-1$	-0.072* (-1.73)	-0.073* (-1.73)
Securities $i,t-1$	-0.400*** (-13.52)	-0.399*** (-13.49)
Size $i,t-1$	-0.031*** (-4.74)	-0.031*** (-4.74)
Change equity index $i,t-1$	-0.006 (-0.43)	-0.005 (-0.32)
Change exposure $i,t-1$	-0.002* (-1.79)	-0.002** (-2.36)
Change sovereign debt $i,t-1$	-0.006 (-0.11)	0.003 (0.05)
Change sovereign yield $i,t-1$	-0.018*** (-10.36)	-0.017*** (-8.70)
Change unemployment rate i,t	0.020*** (10.74)	0.020*** (9.73)
Policy rate i,t	0.050*** (8.09)	0.050*** (7.58)
Sovereign yield $i,t-1$	0.001 (0.34)	-0.001 (-0.17)
Forecast GDP i,t		0.012** (2.03)
Forecast sovereign yield i,t		0.004 (0.67)
Constant	0.599*** (6.02)	0.577*** (5.82)
Bank fixed effects	Yes	Yes
Year fixed effects	Yes	Yes
Observations	6437	6437
Adjusted R-squared	0.3043	0.3048

This table reports the results of the investment portfolio analysis. Results are from the analysis comparing peer banks in disclosing countries to peer banks in non-disclosing countries. Please refer to Appendix B for variable definitions and data sources. All continuous variables are winsorized at the 1st and the 99th percentiles. All regressions include bank and year fixed effects. Standard errors are clustered at bank level (t-stat in brackets). ***, **, and * indicate statistical significance at the 1 %, 5 %, and 10 % two-tail levels, respectively.

Recommendation as a baseline period for comparison. In fact, the inclusion of sovereign debt exposures in EBA exercises is concomitant with the adoption of the ESMA Recommendation in 2011. As dealers can use derivatives to hedge and offset risks, we use *net* sovereign debt exposures that already take into account derivatives and other short positions. These financial instruments are however costly and represent on average less than 5 % of gross sovereign debt exposures in our sample.

Second, we hand-collect and content-analyze dealers' financial statements. This process allows us to identify whether a dealer discloses sovereign debt exposures by country and by classification in financial statements. Notably, this disclosure does not contain any information regarding sovereign debt maturity. As a result, peer banks, and incidentally our analysis, overlook any maturity considerations. Although EBA exercises contain sovereign debt exposures by maturity, this

information is communicated to peer banks with an average delay close to eleven months, therefore it is not available when bank managers make most of their investment and lending decisions for the current year (between January and December). We provide an example of a dealer's financial statement and EBA exercise in Appendix A. We collect data on dealers from AFME handbooks ([Association for Financial Markets in Europe AFME, 2010, 2015, 2017, 2020](#)).

Finally, we collect financial variables from *Bureau van Dijk (BvD) Bankfocus*, which offers the best coverage of listed and private banks in Europe. Macroeconomic variables come from *Bloomberg*, *European Central Bank*, *IMF Economic Outlook*, *OECD Data*, and *World Bank Economic Indicators*. We collect data on policy rates directly from the Central Bank websites.

4.3. Sample

Our *BvD Bankfocus* sample includes listed and private banks from 19 European countries whose sovereign debt market is organized with primary dealers. Our study covers the period from 2012 to 2019 and consists of 6437 bank-year observations, of which 48 % refer to disclosing countries. To rule out unconventional measures related to the Covid-19 pandemic, we limit the sample period from 2012 to 2019. We only include the non-missing variable filter. All dealers (both disclosing and non-disclosing) are excluded from the analysis as our purpose is to focus on spillover effects. We define peers as all other domestic banks that do not act as dealers. Among our observations, 58 % refer to Germany (non-disclosing) and Italy (disclosing), two countries with a fragmented banking industry ([Moch, 2013](#)). [Table 1](#) shows the sample distribution by year (Panel A) and by country (Panel B). The number of observations increases during the sample period, which is due to the partial availability of certain financial variables for the years 2012 and 2013.

We provide descriptive statistics in Panel C of [Table 1](#). All continuous variables are winsorized at the 1 % and 99 % levels. The sovereign debt portfolio, which consists of all sovereign debt exposures, is on average around 11 % of total assets (untabulated). Its domestic portion is equal to 64 % (untabulated). *Classification* ranges from -38 % to +24 %, thus exhibiting sufficient variation. We can draw some descriptive evidence on the dependent variables as well. First, banks have 22 % of total assets in the investment portfolio (*Securities*). *Change securities* ranges from -18 % to +26 %, thus displaying variation. Second, the loan portfolio represents 62 % of total assets (*Gross loans*) while its change (*Change gross loans*) ranges from -16 % to +51 %, thus displaying variation.

5. Main results

5.1. Predictability of sovereign yields

As a first step, we perform a predictability analysis to examine whether dealers' sovereign debt classification at amortised cost is an indicator of future sovereign yields. The goal of this analysis is to provide empirical evidence that dealers' sovereign debt classification has information content, i.e. it is useful to predict future sovereign yields. Moreover, this analysis also aims to address potential endogeneity concerns of our setting. To examine whether and how dealers' sovereign debt classification is associated with future sovereign yields, we run the following ordinary least squares (OLS) regression model:

$$\text{Sovereign yield}_{i,t+1} = \beta_0 + \beta_1 \text{Classification}_{i,t} + \beta_2 \text{Sovereign yield}_{i,t} + \beta_i \text{Controls} + \text{Country FE} + \text{Year FE} + e_{i,t} \quad (1)$$

Our *EBA* sample contains listed and private banks from 19 European countries that are included in EBA exercises. This analysis covers the period from 2012 to 2019, thus matching that of our study. *Classification* is now defined at bank-year level. *Sovereign yield* is the long-term interest rate of a country. We use the 10-year sovereign yield because it is a key

economic indicator²³ and, most importantly, because the average residual sovereign debt maturity of European countries is close to ten years. We include country and year fixed effects to control for country- and time-invariant characteristics. Following prior literature, and given the small number of countries in our sample (Angrist and Pischke, 2009, p. 320), standard errors are clustered at bank level. We add several bank and macroeconomic variables that capture the economic outlook of a country and proxy for information that is publicly available. *Change sovereign debt* controls for new sovereign debt issuances and is defined as the variation in the ratio between a country's sovereign debt and its gross domestic product. *Change sovereign yield* controls for the change in the interest rate of a country. We further control for *Change exposure* that captures a bank's investments in government securities. Since we use a forecasting model (De Marco et al., 2022), we control for the current dependent variable. We also include *Forecast sovereign yield*, the long-term interest rate forecast, which is defined as the 10-year sovereign yield forecast. As expected, it is highly correlated (97 %) with *Sovereign yield*, suggesting that current yields already incorporate forward-looking information. Including both variables in the model could potentially lead to biased estimates.²⁴ Therefore, we use two distinct specifications and perform the analysis controlling for and without forecast variables.

Table 2 shows the EBA sample distribution by year (Panel A) and by country (Panel B) of 408 bank-year observations (132 unique domestic banks). We tabulate the descriptive statistics in Panel C of Table 2. All continuous variables are winsorized at the 1 % and 99 % levels. The change in sovereign debt at amortised cost (*Classification*) is on average equal to 4 %, ranging from -61 % to +255 %. On average, only 26 % of the banks in the EBA sample provide detailed information in their financial statements (*Disclosure*). *Dealer*, an indicator variable equal to one if a bank acts as a primary dealer and zero otherwise, is equal to 56 % on average. Please see Appendix B for detailed variable definitions.

We provide the results of model (1) in Table 3. Panel A reports the results for domestic banks while Panel B shows the results for foreign banks. In Panel A, the coefficient on *Classification* is positive and statistically significant in the dealers subsample (Columns 3 and 4), indicating that domestic dealers' sovereign debt classification at amortised cost is an indicator of future sovereign yields. The coefficient on *Classification* is not statistically significant in the all banks and non-dealers subsamples (Columns 1–2 and 5–6), indicating that non-dealers' sovereign debt classification has limited predictive ability. Moreover, the insignificant coefficients on *Classification* in Columns 1–6 of Panel B suggest that foreign banks' sovereign debt classifications at amortised cost are not indicative of future sovereign yields. In sum, these results show that sovereign debt classifications of domestic dealers' reveal superior information sets regarding expected sovereign yields and improve the predictive ability of other information sources.

It is worth noting that the content of sovereign debt disclosures remains voluntary and is left to the single bank (see also Bischof and Daske, 2013, p. 3), thus entailing potential self-selection of disclosing

dealers. We therefore examine potential information content differences between disclosing and non-disclosing dealers. We focus on domestic banks in the light of the results of Table 3 and include *Disclosure* and the interaction term *Classification#Disclosure* in the regression model (1). We tabulate the results in Table 4. The coefficient on *Classification* is positive and statistically significant in the dealers subsample (Columns 3 and 4). The coefficients on *Disclosure* and *Classification#Disclosure* are not statistically significant, indicating that the predictive ability of dealers' sovereign debt classification is not related to the disclosure regime. Finally, the variables of interest do not exhibit any statistically significant coefficients in the all banks and non-dealers subsamples (Columns 1–2 and 5–6). Overall, the results of Table 4 indicate that dealers' sovereign debt classification is associated with future sovereign yields regardless of the disclosure regime, thus mitigating potential concerns on the self-selection of disclosing dealers.

It could be argued that peer banks, which are smaller, simply follow larger counterparts. In this vein, we examine whether the predictive ability of dealers' sovereign debt classification depends on their size. This test is important to highlight peer banks' incentives to follow all dealers, not just larger banks. Consistent with existing literature (De Marco et al., 2022), we focus on the size of sovereign debt portfolio to identify potential information asymmetries between larger and smaller dealers. More precisely, *Big* is an indicator variable equal to one if a dealer's sovereign debt portfolio is above the top quartile and zero otherwise (we do the same for non-dealers). We include *Big* and the interaction term *Classification#Big* in the regression model (1) and tabulate the results in Table 5.²⁵ The coefficient on *Classification* is positive and statistically significant in the dealers subsample (Columns 3 and 4). The coefficients on *Big* and *Classification#Big* are not statistically significant (Columns 3 and 4). Moreover, the coefficient on the variables of interest are not significant in the other subsamples, thus mitigating size effects also for non-dealers (Columns 1–2 and 5–6). The results of Table 5 indicate that the predictive ability of dealers' sovereign debt classification and consequently peer banks' incentives to act accordingly are unlikely due to size.

5.2. Investment portfolio

The first hypothesis states that peer banks adapt the investment portfolio according to dealers' sovereign debt classification. To test it, we use the *BvD Bankfocus* sample and perform the following ordinary least squares (OLS) regression model:

$$\begin{aligned} \text{Change securities}_{i,t} = & \beta_0 + \beta_1 \text{Classification}\#\text{Disclosure}_{i,t-1} \\ & + \beta_2 \text{Classification}_{i,t-1} + \beta_3 \text{Disclosure}_{i,t-1} \\ & + \beta_4 \text{Controls} + \text{Bank FE} + \text{Year FE} + e_{i,t} \end{aligned} \quad (2)$$

We investigate whether and how the timely disclosure of dealers' sovereign debt classification affects peer banks' financial instruments (*Change securities*). *Classification#Disclosure* captures information transfers from disclosing dealers to peer banks. We include bank and year fixed effects to control for bank- and time-invariant characteristics. Standard errors are clustered at bank level.

Consistent with extant literature (Meder, 2015; Chircop and Novotny-Farkas, 2016; Kim et al., 2019), we control for bank and country time-variant characteristics that relate to asset allocation decisions. If not stated differently, control variables are lagged by one year to capture fundamental information that was known to bank managers at the time the decision was made. In particular, we control for *Delinquency*, *Deposits*, *Financial income*, *Gross loans*, *Regulatory capital*, *Securities*, *Size*, *Change equity index*, *Change exposure*, *Change sovereign debt*, *Change sovereign yield*, *Change unemployment rate*, *Policy rate*, *Sovereign*

²³ We focus on the 10-year sovereign yield because it is commonly used as an economic indicator of investor confidence (see <https://www.stlouisfed.org/op-en-vault/2022/apr/what-bond-yields-signal-about-economy>). See also <https://data.ecb.europa.eu/data/data-categories/prices-macro-economic-and-sectoral-statistics/government-finance/government-debt/gross-government-debt-consolidated/residual-maturity>.

²⁴ We also consider including interest rate futures as an additional proxy for market participants' interest rate expectations and information publicly available. We collect data on interest rate futures from Bloomberg. Data are available only for the following sovereign issuers: France, Germany, Italy, Spain, and the United Kingdom (see <https://www.eurex.com/ex-en/markets/int/fix/government-bonds> for the list of interest rate future contracts). The correlation between interest rate futures and the current sovereign yield is equal to 98 %. We opt for retaining the current sovereign yield as a control variable in order to maximize the sample size.

²⁵ In an untabulated analysis, we use total assets as a proxy for size and find similar results.

yield, *Forecast GDP* and *Forecast sovereign yield*.²⁶

Delinquency is defined as the ratio of non-performing loans over gross loans and captures the quality of the existing loan portfolio (Kishan and Opiela, 2000). Loans and financial instruments are substitute asset allocation decisions (Kim et al., 2019). Since poor loan quality impairs the ability to make new loans, *Delinquency* is positively related to the investment portfolio and vice-versa. *Deposits* is the change in customer deposits over total assets and proxies for the availability of funds; it is positively related to both financial instruments and loans (Bernanke and Blinder, 1992). *Financial income* captures banks' exposure to capital markets (Hodder et al., 2002); it is defined as total financial income including fair value gains/losses and controls for current fair value changes of financial instruments.²⁷ *Gross loans* is the ratio of gross customer loans over total assets, and captures the size of the existing loan portfolio (Mede, 2015). Following Kishan and Opiela (2000), (2006), we control for regulatory capital. We define *Regulatory capital* as the ratio of Tier 1 capital over risk-weighted total assets. *Securities* equals the ratio of financial instruments over total assets and controls for the size of the investment portfolio (Kim et al., 2019). *Size* is the natural logarithm of total assets and is included to rule out potential size effects.

We also add macroeconomic variables that capture the economic outlook of a country and proxy for information that is publicly available. *Change equity index* captures equity market trends. *Change exposure* controls for dealers' investments in government securities. This variable is defined as the change in domestic sovereign debt over lagged sovereign debt portfolio ((domestic sovereign debt t – domestic sovereign debt $t-1$)/sovereign debt $t-1$). *Change exposure* is defined at country-year level as the weighted average of dealers' investments, where the weights refer to their domestic sovereign debt exposures. *Change sovereign debt* controls for new sovereign debt issuances. This variable is included to mitigate concerns that dealers' decisions to classify government securities might be correlated with new sovereign debt issuances. *Change sovereign yield* controls for the change in the interest rate of a country (Hodder et al., 2002). *Change unemployment rate* captures loan demand (Mede, 2015). We include *Policy rate* to control for monetary policies that relate to the availability of funds (Bernanke and Blinder, 1992). *Sovereign yield* controls for the long-term interest rate of a country (10-year). Furthermore, *Forecast GDP* is equal to the long-term GDP forecast and captures the expected growth rate of a country. We also include *Forecast sovereign yield*, the long-term interest rate forecast, to control for expected sovereign yields. Since sovereign yields are highly autocorrelated, (see Poghosyan, 2012, for more details on the autocorrelation of sovereign yields), the level of current and future sovereign yields goes hand in hand. As a result, current sovereign yields already reflect forward looking information, as confirmed by the high correlation between *Sovereign yield* and *Forecast sovereign yield* (97 %). We thus use two distinct specifications including or excluding forecast variables, respectively.

We expect the coefficient on *Classification#Disclosure* to be negative and statistically significant in the *Change securities* model, and our expectations are borne out. We report the results in Table 6 (Columns 1 and 2). More precisely, a 1 % increase in dealers' sovereign debt at amortised cost (if timely disclosed in financial statements) results in a

1.08 % reduction in the investment portfolio. We find that when dealers disclose more sovereign debt at amortised cost, peer banks divest financial instruments as they anticipate expected decreases in prices. Notably, *Classification* is not statistically significant, suggesting that it is its timely disclosure rather than the classification per se which affects peer banks' asset allocation decisions.

Our control variables show signs consistent with prior research. *Delinquency* has a positive coefficient: the lower the quality of the loan portfolio, the higher the incentives to invest in financial instruments. *Deposits* proxies for the availability of funds and exhibits a positive sign. *Change exposure* exhibits a negative coefficient, suggesting a rotation in asset allocation decisions. *Change sovereign yield* has also a negative coefficient: rising yields are associated with decreases in the investment portfolio, which is consistent with our first hypothesis. *Change unemployment rate* has a positive sign: the higher the unemployment rate, the lower the loan demand. As a result, banks managers tend to invest more in financial instruments. *Policy rate* also exhibits a positive coefficient. Stricter monetary policies are associated with lower loan demand, which, in the end, increases the investment portfolio. Finally, *Forecast sovereign yield* is not statistically significant due to the high correlation with *Sovereign yield* (97 %) (in the untabulated stand-alone model it is statistically significant).

5.3. Loan portfolio

The second hypothesis states that peer banks adapt the loan portfolio according to dealers' sovereign debt classification. To test it, we perform the following ordinary least squares (OLS) regression model:

$$\begin{aligned} \text{Change gross loans}_{i,t} = & \beta_0 + \beta_1 \text{Classification} \# \text{Disclosure}_{i,t-1} \\ & + \beta_2 \text{Classification}_{i,t-1} + \beta_3 \text{Disclosure}_{i,t-1} \\ & + \beta_4 \text{Controls} + \text{Bank FE} + \text{Year FE} + e_{i,t} \end{aligned} \quad (3)$$

The features of model (3) are the same as in the previous model (2). *Change gross loans* is the dependent variable. Again, we use two distinct specifications, controlling for and without *Forecast GDP* and *Forecast sovereign yield*, respectively.

We provide the results in Table 7. The coefficient on *Classification#Disclosure* is positive and statistically significant in the *Change gross loans* model (Columns 1 and 2). More precisely, a 1 % increase in dealers' sovereign debt at amortised cost (if disclosed) results in a 1.45 % increase in the loan portfolio. Notably, this economic magnitude is aligned with that of the *Change securities* model, thus confirming that financial instruments and loans are substitute asset allocation decisions. We find that peer banks, anticipating expected increases in yields, make new loans when dealers timely disclose more sovereign debt at amortised cost. *Classification* is not statistically significant.

Our control variables have signs consistent with prior research. *Delinquency* has a negative coefficient: banks reduce loans when the quality of the existing loan portfolio is poor. Similarly, *Gross loans* captures the size of the loan portfolio and exhibits a negative sign. *Deposits* proxies for the availability of funds and has a positive coefficient. *Sovereign yield* shows a positive sign: interest rates are positively associated with loans, which is consistent with the second hypothesis. Lastly, by capturing decreases in loan demand, *Change unemployment rate* and *Policy rate* have negative coefficients.

6. Peer banks' internal information

To better understand the dynamics underlying our findings, we take a closer look at peer banks' weighting process between internal and external information (Aymanns and Georg, 2015). Since peer banks develop expectations on future sovereign yields also organically, this internal information is deemed to play a relevant role in their asset allocation decisions. On the one hand, peer banks with a superior ability to develop internal information are less likely to rely on dealers'

²⁶ In an untabulated analysis, we also control for *Change rating*, *Debt GDP ratio*, *Net interest margin*, and *Profitability*, and find similar results. Yet these variables are highly correlated and often do not exhibit sufficient variation. For example, changes in credit ratings of sovereign issuers are unlikely events. Notably, *Classification* is available only for banks included in EBA exercises. More precisely, peer banks in EBA exercises represent 3.5 % of our *BvD Bankfocus* sample. As a result, including a bank's own *Classification* as a control variable in the model severely impairs the scope of the analysis.

²⁷ Controlling only for fair value gains/losses (instead of *Financial income*) yields similar results. Yet we lose 40% of the observations because of missing data. Therefore, we opt for using *Financial income*.

sovereign debt classification, even when it is timely disclosed. On the other hand, peer banks with limited internal information are more likely to rely on external information, including dealers' sovereign debt classification, in the weighting process of the two information sets. We predict that our findings are more pronounced among peer banks that have an information disadvantage.

De Marco et al. (2022) find that sovereign debt exposures are positively associated with future returns and macroeconomic forecast accuracy, concluding that the size of these exposures is an indicator of a bank's information set. Consistently, we use the size of sovereign debt portfolio to identify information asymmetries between dealers and peer banks. Since *BvD Bankfocus* does not provide sovereign debt exposures by country and/or by classification, this variable encompasses both domestic and foreign sovereign debt. The home bias however mitigates these concerns (Burger and Warnock, 2003; Coeurdacier and Rey, 2013; Enria et al., 2016; Ongena et al., 2019). Peer banks whose size of sovereign debt portfolio is above and below the top quartile value are assigned respectively to the *High* and *Low internal information* subsamples. We then test the difference in coefficients between the two subsamples.

We provide the results in Table 8. Control variables are included but not tabulated for parsimony. The coefficients on *Classification#Disclosure* is aligned and statistically significant only in the *Low internal information* subsample (Columns 1 and 3). The *t*-test comparing the coefficients between the two subsamples is statistically significant in the *Change securities* model (it is statistically significant in the *Change gross loans* model at the one-tail level). These results indicate that our findings are more pronounced among peer banks with limited internal information, those facing a greater information disadvantage. In sum, our prediction that information asymmetries between dealers and peer banks play a relevant role in the weighting process of different information sets is supported by these additional analyses.

7. Robustness tests

In Table 4 (see above), we address potential self-selection concerns related to disclosing dealers by showing that dealers' sovereign debt classification is associated with future sovereign yields, regardless of the disclosure regime. We run some robustness tests to further confirm these findings. The first tabulated robustness test consists in running the predictability analysis at country level instead of bank level. Our sample consists of 83 country-year observations from 19 European countries over the 2012–2019 period. We control for *Change exposure* and other public information sources. We tabulate the results in Table 9. The coefficient on *Classification* is positive and statistically significant across the models (Columns 1–4), indicating that dealers' sovereign debt classification at amortised cost is an indicator of future sovereign yields. Moreover, the coefficients on *Disclosure* and *Classification#Disclosure* are not statistically significant, confirming that the predictive ability of dealers' sovereign debt classification is not related to the disclosure regime. Notwithstanding the limited number of countries, we also cluster standard errors at country level, finding similar results. These results confirm those of the predictability analysis at bank level and mitigate concerns that there are major differences in terms of predicting future sovereign yields between disclosing and non-disclosing countries.

As a second robustness test, we examine whether and how peer banks adapt their asset allocation decisions according to dealers' sovereign debt classification after the release of EBA exercises. As mentioned earlier, EBA exercises are released to the public with an average delay close to eleven months. To avoid confounding spillover effects of sovereign debt disclosures in financial statements, this test is limited to non-disclosing countries. We tabulate the results in Table 10. The coefficient on *Classification* is not statistically significant across the models (Columns 1–4). These results indicate that peer banks tend not to incorporate the information content of EBA exercises, likely due to its lack of timeliness.

Table 7
Loan portfolio.

Variable:	Change gross loans i,t	
	(1)	(2)
Classification#Disclosure $i,t-1$	0.149*** (4.73)	0.145*** (4.18)
Classification $i,t-1$	-0.015 (-1.17)	-0.022 (-1.52)
Disclosure $i,t-1$	-0.009 (-1.60)	-0.006 (-1.19)
Delinquency $i,t-1$	-0.133*** (-3.51)	-0.138*** (-3.60)
Deposits i,t	0.577*** (22.16)	0.576*** (22.19)
Financial income i,t	-0.895** (-2.40)	-0.866** (-2.31)
Gross loans $i,t-1$	-0.150*** (-4.78)	-0.150*** (-4.68)
Regulatory capital $i,t-1$	0.019 (0.39)	0.017 (0.36)
Securities $i,t-1$	0.045 (1.49)	0.045 (1.46)
Size $i,t-1$	-0.038*** (-3.30)	-0.038*** (-3.28)
Change equity index $i,t-1$	0.058*** (3.79)	0.064*** (4.11)
Change exposure $i,t-1$	0.001 (1.53)	0.002* (1.76)
Change sovereign debt $i,t-1$	0.180** (2.54)	0.173** (2.43)
Change sovereign yield $i,t-1$	0.006*** (3.05)	0.003 (1.31)
Change unemployment rate i,t	-0.012*** (-5.27)	-0.015*** (-5.61)
Policy rate i,t	-0.042*** (-5.13)	-0.051*** (-6.10)
Sovereign yield $i,t-1$	0.011*** (4.19)	0.001 (0.12)
Forecast GDP i,t		-0.007 (-1.07)
Forecast sovereign yield i,t		0.020** (2.40)
Constant	0.633*** (3.72)	0.628*** (3.70)
Bank fixed effects	Yes	Yes
Year fixed effects	Yes	Yes
Observations	6437	6437
Adjusted R-squared	0.5818	0.5826

This table reports the results of the loan portfolio analysis. Results are from the analysis comparing peer banks in disclosing countries to peer banks in non-disclosing countries. Please refer to Appendix B for variable definitions and data sources. All continuous variables are winsorized at the 1st and the 99th percentiles. All regressions include bank and year fixed effects. Standard errors are clustered at bank level (t-stat in brackets). ***, **, and * indicate statistical significance at the 1 %, 5 %, and 10 % two-tail levels, respectively.

In additional untabulated robustness tests, we restrict the sample to the Eurozone. In this case, the goal is to mitigate concerns that different exchange rates and monetary policies could drive our findings. Results are robust to retaining only Eurozone banks. We also restrict the sample to countries that do not change their disclosure regime during our sample period. We drop observations from Austria, France, and Poland, which represent 7 % of the sample, and find similar results. Moreover, we extend our sample to include the observations of year 2020 as the Covid 19 unfolded and find similar results. Finally, results are robust when we define *Classification* as the change in domestic sovereign debt at amortised cost over total assets or over domestic sovereign debt exposures. These results are untabulated for parsimony.

8. Discussion and conclusions

In this paper, we investigate whether and how the timely disclosure of dealers' sovereign debt classification in their financial statements

Table 8
Peer banks' internal information.

Variable:	Change securities i_{t-1}		Change gross loans i_{t-1}	
	(1)	(2)	(3)	(4)
Classification#Disclosure i_{t-1}	-0.162*** (-3.66)	0.009 (0.15)	0.159*** (3.42)	0.051 (0.90)
Classification i_{t-1}	0.037* (1.82)	-0.019 (-0.85)	-0.009 (-0.43)	0.035 (1.30)
Disclosure i_{t-1}	0.006 (0.40)	0.012 (1.07)	0.006 (0.39)	-0.007 (-0.92)
Subsample	Low	High	Low	High
Test Small = Big	0.022		0.142	
Control variables	Yes	Yes	Yes	Yes
Bank fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Observations	3895	1298	3895	1298
Adjusted R-squared	0.3387	0.3117	0.6134	0.5682

This table reports the results of the peer banks' internal information analysis. Internal information category assignments use criteria based on the size of a bank's sovereign debt portfolio (below and above the top quartile). Test Low = High is a t -test of equality of the Classification#Disclosure coefficients between the two subsamples. Please refer to Appendix B for variable definitions and data sources. All continuous variables are winsorized at the 1st and the 99th percentiles. All regressions include bank and year fixed effects. Standard errors are clustered at bank level (t -stat in brackets). ***, **, and * indicate statistical significance at the 1 %, 5 %, and 10 % two-tail levels, respectively.

affects peer banks' asset allocation decisions. The core idea of our paper is that this classification is likely to reflect dealers' superior information sets regarding expected sovereign yields, and – if its disclosure is timely, i.e. included in their financial statements – peer banks adapt investment and lending decisions accordingly. The non-uniform implementation of the ESMA Recommendation is our unique research setting. We predict and find that peer banks divest financial instruments and increase loans when dealers disclose more sovereign debt at amortised cost. Our findings are robust to alternative explanations.

Our study makes several contributions to the literature. First, we

Table 9
Predictability of sovereign yields at country level.

Variable:	Sovereign yield i_{t+1}			
	(1)	(2)	(3)	(4)
Classification i_t	0.854** (2.67)	0.898*** (2.75)	0.700* (1.90)	0.730* (1.97)
Disclosure i_t			0.058 (0.25)	0.040 (0.17)
Classification # Disclosure i_t			0.975 (0.97)	1.083 (1.06)
Change exposure i_t	0.001 (0.07)	0.002 (0.08)	0.000 (0.01)	0.000 (0.01)
Change sovereign debt i_t	-2.380** (-2.04)	-1.610 (-1.05)	-2.519** (-2.13)	-1.650 (-1.06)
Change sovereign yield i_t	0.049 (0.99)	-0.027 (-0.25)	0.038 (0.73)	-0.050 (-0.44)
Sovereign yield i_t	0.685*** (14.09)	0.844*** (4.01)	0.701*** (13.40)	0.885*** (4.07)
Forecast sovereign yield i_t		-0.174 (-0.78)		-0.198 (-0.87)
Constant	0.133 (0.83)	0.165 (1.00)	0.057 (0.30)	0.096 (0.48)
Country fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Observations	83	83	83	83
Adjusted R-squared	0.9617	0.9614	0.9611	0.9609

This table reports the results of the predictability of sovereign yields at country level. Please refer to Appendix B for variable definitions and data sources. All continuous variables are winsorized at the 1st and the 99th percentiles. All regressions include country and year fixed effects. Standard errors are not clustered (t -stat in brackets). ***, **, and * indicate statistical significance at the 1 %, 5 %, and 10 % two-tail levels, respectively.

show that the timely disclosure of dealers' sovereign debt classification affects peer banks' asset allocation decisions, thus extending the literature on the classification of financial instruments. Prior research only explores how the classification of financial instruments impacts a bank's own activities (Beatty, 1995; Hodder et al., 2002; Meder, 2015; Chircop and Novotny-Farkas, 2016; Argimon et al., 2018; Kim et al., 2019). Our main innovation is showing that dealers' sovereign debt classifications – if timely disclosed – affect peer banks' investment and lending decisions. Second, we show that dealers' sovereign debt classification is not merely an accounting choice but also carries forward-looking information. We therefore provide *prima facie* evidence on the information content of dealers' sovereign debt classification at amortised cost, thus contributing to the ongoing debate on accounting standards regulating financial instruments (Plantin et al., 2008; Laux, 2016; Xie, 2016; Laux and Rauter, 2017). Third, we show that spillover effects can unfold from the timely disclosure of the classification of financial instruments in financial statements (Docking et al., 1997; Frank et al., 2004; Verbeek and Wang, 2013; Caiazza et al., 2018; Hagenberg, 2024).

Our findings are subject to certain caveats and some caution should be used when interpreting them. First, the majority of our observations

Table 10
EBA exercises.

Variable:	Change securities i_t		Change gross loans i_t	
	(1)	(2)	(3)	(4)
Classification i_{t-1}	0.002 (0.16)	0.002 (0.18)	-0.016 (-1.07)	-0.017 (-1.07)
Delinquency i_{t-1}	0.065 (1.13)	0.066 (1.15)	-0.035 (-0.81)	-0.044 (-1.00)
Deposits i_t	0.244*** (13.66)	0.245*** (13.54)	0.690*** (27.36)	0.682*** (26.71)
Financial income i_t	0.096 (0.12)	0.116 (0.15)	-0.092 (-0.14)	-0.246 (-0.40)
Gross loans i_{t-1}	-0.035 (-1.20)	-0.035 (-1.22)	-0.218*** (-4.61)	-0.214*** (-4.50)
Regulatory capital i_{t-1}	0.013 (0.25)	0.012 (0.24)	-0.054 (-0.75)	-0.056 (-0.78)
Securities i_{t-1}	-0.418*** (-10.25)	-0.418*** (-10.27)	0.036 (0.79)	0.039 (0.86)
Size i_{t-1}	-0.020* (-1.95)	-0.020* (-1.93)	-0.051*** (-3.64)	-0.051*** (-3.76)
Change equity index i_{t-1}	0.055*** (2.75)	0.055*** (2.71)	0.057*** (2.71)	0.064*** (3.07)
Change exposure i_{t-1}	-0.003*** (-3.42)	-0.004*** (-3.44)	0.001 (1.36)	0.004*** (3.21)
Change sovereign debt i_{t-1}	0.103 (1.41)	0.128 (1.45)	0.215** (2.14)	0.040 (0.42)
Change sovereign yield i_{t-1}	0.007 (1.02)	0.008 (1.11)	-0.014* (-1.94)	-0.021*** (-2.62)
Change unemployment rate i_t	0.009** (2.48)	0.009* (1.77)	-0.013** (-2.16)	-0.011* (-1.65)
Policy rate i_t	0.017* (1.84)	0.020* (1.89)	-0.018 (-1.38)	-0.041*** (-3.17)
Sovereign yield i_{t-1}	0.012* (1.66)	0.018 (1.64)	0.003 (0.28)	-0.037*** (-2.76)
Forecast GDP i_t		0.002 (0.24)		-0.029*** (-2.97)
Forecast sovereign yield i_t		-0.009 (-0.65)		0.064*** (3.68)
Constant	0.369** (2.39)	0.366** (2.38)	0.876*** (4.16)	0.926*** (4.44)
Bank fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Observations	3323	3323	3323	3323
Adjusted R-squared	0.4070	0.4066	0.7272	0.7313

This table reports the results of the EBA exercises analysis. The sample is restricted to non-disclosing countries. Please refer to Appendix B for variable definitions and data sources. All continuous variables are winsorized at the 1st and the 99th percentiles. All regressions include bank and year fixed effects. Standard errors are clustered at bank level (t -stat in brackets). ***, **, and * indicate statistical significance at the 1 %, 5 %, and 10 % two-tail levels, respectively.

refers to German and Italian banks, which combined represent 58 % of the sample. The external validity of our findings might be limited. Second, during our sample period, various legislative interventions deeply changed banks' regulatory framework. For example, Basel III became effective since 2014 and IFRS 9 replaced IAS 39 since 2018. We acknowledge that the proliferation of new rules could also lead peer banks' asset allocation decisions (Hendricks et al., 2022). Although these new regulations should affect peer banks in the same way in both disclosing and non-disclosing countries, we cannot fully rule out that there might be some concurrent effects. Third, as the adoption of the ESMA Recommendation is concomitant with the inclusion of sovereign debt exposures in EBA exercises, this data constraint limits our ability to apply a diff-in-diff design and investigate the period before its enactment. A further limitation is that disclosing dealers do not provide any information regarding sovereign debt maturity or newly-purchased government securities in financial statements. As a result, our analysis overlooks these dimensions. Moreover, *BvD Bankfocus* does not provide data on financial instruments by country and/or by classification or loan level characteristics. Finally, we cannot open the *black box* of dealers' superior information sets regarding expected yields. Data limitations do not allow us to test whether dealers' superior information sets arise from their expertise, from a mosaic of formal and informal interactions with State Treasury Agencies and/or other members of the network, or are influenced by other sources such as social ties of the staff.

Future avenues of research are promising. We identify a novel setting, namely dealers' sovereign debt classification, that can be investigated through multiple lenses to explore the many research questions which still remain unanswered. For example, does the timely disclosure of dealers' sovereign debt classification affect the real

economy in a pro-cyclical way? This and other questions are left to future research.

Declaration of generative AI in scientific writing

During the preparation of this work we did not use any generative AI tools.

CRediT authorship contribution statement

Francesco Grazioli: Writing – review & editing, Writing – original draft, Validation, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Annalisa Prencipe:** Writing – review & editing, Writing – original draft, Validation, Methodology, Investigation, Formal analysis, Data curation, Conceptualization.

Declaration of interests

There are no conflicts of interests to declare.

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Appendix A – Disclosure of sovereign debt exposures by country and by classification

Panel A: Dealers			
Country	Name	Disclosure regime	Sovereign debt classification
Austria	Bawag	Non-disclosing	Included
Austria	Erste	Disclosing from 2011 to 2016	Included
Austria	Raiffeisen	Non-disclosing	Included
Austria	Volksbanken Verbund	Non-disclosing	Included
Belgium	KBC Group	Disclosing from 2011	Included
Bulgaria	First Investment Bank	Disclosing from 2018	Included
Denmark	Danske Bank	Non-disclosing	Included
Denmark	Nykredit	Non-disclosing	Included
Denmark	Sydbank	Non-disclosing	Included
Finland	Nordea Bank	Non-disclosing	Included
France	BNP Paribas	Disclosing from 2015	Included
France	Crédit Agricole	Disclosing from 2014	Included
France	Group BPCE	Non-disclosing	Included
France	Société Générale	Non-disclosing	Included
Germany	Commerzbank	Non-disclosing	Included
Germany	DekaBank	Non-disclosing	Included
Germany	Deutsche Bank	Non-disclosing	Included
Germany	DZ Bank	Non-disclosing	Included
Germany	Landesbank Baden-Württemberg	Non-disclosing	Included
Germany	Landesbank Bayerische	Non-disclosing	Included
Germany	Landesbank Hessen-Thüringen	Non-disclosing	Included
Germany	Landesbank Norddeutsche	Non-disclosing	Included
Greece	Alpha Bank	Disclosing from 2011	Included
Greece	Eurobank Ergasias	Non-disclosing	Not included
Greece	National Bank of Greece	Disclosing from 2019	Included
Greece	Piraeus Bank	Non-disclosing	Not included
Hungary	OTP Bank	Non-disclosing	Included
Italy	Intesa Sanpaolo	Disclosing from 2011	Included
Italy	Monte dei Paschi	Disclosing from 2011	Included
Italy	Unicredit	Disclosing from 2011	Included
Netherlands	ABN Amro	Non-disclosing	Included
Netherlands	ING	Non-disclosing	Included
Netherlands	Rabobank	Non-disclosing	Included
Norway	DNB Bank Group	Non-disclosing	Included

(continued on next page)

(continued)

Panel A: Dealers			
Country	Name	Disclosure regime	Sovereign debt classification
Norway	SpareBank 1 SMN	Non-disclosing	Included
Poland	Polski Bank	Disclosing from 2018	Included
Portugal	BPI (acquired in 2015)	Disclosing from 2011 to 2014	Included
Portugal	Caixa Geral de Depósitos	Disclosing from 2011	Included
Portugal	Novo Banco (created in 2014)	Disclosing from 2014	Included
Romania	Transylvania Bank	Non-disclosing	Included
Slovenia	Abanka	Non-disclosing	Not included
Slovenia	Nova Ljubljanska Bank	Disclosing from 2011	Included
Spain	Bakinter	Disclosing from 2016	Included
Spain	BBVA	Disclosing from 2011 to 2016	Included
Spain	BFA Bankia	Disclosing from 2011	Included
Spain	Caixa	Disclosing from 2011	Included
Spain	Santander	Disclosing from 2013	Included
Sweden	Skandinaviska Enskilda Banken	Disclosing from 2011	Included
Sweden	Svenska Handelsbanken	Non-disclosing	Not included
Sweden	Swedbank	Disclosing from 2011	Included
United Kingdom	Barclays	Non-disclosing	Included
United Kingdom	HSBC	Non-disclosing	Included
United Kingdom	Lloyds	Non-disclosing	Included
United Kingdom	NatWest	Non-disclosing	Included

Banco Cooperativo Español and Cecabank (Spain) are dealers that are not included in EBA exercises. We exclude them for the lack of data.

Panel B: Banco Santander Annual report 2015 (p. 222) and EBA stress test 2016 (p. 21)

Appendix B – Variable definitions and data sources

BvD Bankfocus sample

Variable:	Definition:	BvD Code:	Source:
INDEPENDENT VARIABLES			
Disclosure	Indicator variable equal to one if a dealer discloses sovereign debt exposures by country and by classification in financial statements and zero otherwise. The variable is defined at country-year level.		Annual reports
Classification	(Domestic sovereign debt at amortised cost t – domestic sovereign debt at amortised cost t-1)/sovereign debt t-1. The variable is defined at country-year level as dealers' weighted average. The weights refer to dealers' domestic sovereign debt exposures.		EBA exercises
Classification #Disclosure	Interaction term between the Classification and Disclosure. The variable is defined at country-year level.		EBA exercises
DEPENDENT VARIABLES			
Securities	Total securities t/total assets t	50,820	BvD Bankfocus
Change securities	(Total securities t – total securities t-1) /total assets t-1	50,820	BvD Bankfocus
Gross loans	Gross loans t /total assets t	51,350	BvD Bankfocus
Change gross loans	(Gross loans t – gross loans t-1) /total assets t-1	51,350	BvD Bankfocus
CONTROL VARIABLES			
Delinquency	Impaired loans t/gross loans t	80,395; 51,350	BvD Bankfocus
Deposits	(Customer deposits t – Customer deposits t-1) /total assets t-1	60,300	BvD Bankfocus
Financial income	Total net trading income (losses) and fair value (FV) gains (losses) t/total assets t	71,700	BvD Bankfocus
Regulatory capital	Tier 1 capital t/risk weighted assets t	99,040	BvD Bankfocus
Size	Natural logarithm of total assets t	52,600	BvD Bankfocus
Change equity index	(Equity index t – equity index t-1) /equity index t-1		Bloomberg
Change exposure	(Domestic sovereign debt t – domestic sovereign debt t-1)/sovereign debt t-1. The variable is defined at country-year level as dealers' weighted average. The weights refer to dealers' domestic sovereign debt exposures.		EBA exercises
Change sovereign debt	Sovereign debt-to-GDP ratio t – sovereign debt-to-GDP ratio t-1		European Central Bank
Change sovereign yield	Sovereign yield t – sovereign yield t-1		OECD Data
Change unemployment rate	Unemployment rate t – unemployment rate t-1		World Bank Economic Indicators
Policy rate	Central bank policy rate t		Central bank websites
Sovereign yield	Sovereign yield t		OECD Data
Forecast GDP	Three-year forward GDP growth rate forecast. It is the longest forecast horizon available. IMF releases its economic bulletin twice a year.		IMF Economic Outlook
Forecast sovereign yield	Ten-year forward sovereign yield forecast.		OECD Data

EBA sample

Variable:	Definition:	BvD Code:	Source:
INDEPENDENT VARIABLES			
Disclosure	Indicator variable equal to one if a bank discloses sovereign debt exposures by country and by classification in financial statements and zero otherwise. The variable is defined at bank-year level.		<i>Annual reports</i>
Classification	(Domestic sovereign debt at amortised cost t – domestic sovereign debt at amortised cost t-1)/sovereign debt t-1. The variable is defined at bank-year level.		<i>EBA exercises</i>
Classification #Disclosure	Interaction term between the Classification and Disclosure. The variable is defined at bank-year level.		<i>EBA exercises</i>
Dealer	Indicator variable equal to one if a bank is a primary dealer and zero otherwise. The variable is defined at bank-year level.		<i>AFME handbooks</i>
DEPENDENT VARIABLES			
Sovereign yield	Sovereign yield t+1		<i>OECD Data</i>
CONTROL VARIABLES			
Change exposure	(Domestic sovereign debt t – domestic sovereign debt t-1)/sovereign debt t-1. The variable is defined at bank-year level.		<i>EBA exercises</i>
Change sovereign debt	Sovereign debt-to-GDP ratio t – sovereign debt-to-GDP ratio t-1		<i>European Central Bank</i>
Change sovereign yield	Sovereign yield t – sovereign yield t-1		<i>OECD Data</i>
Exposure	Natural logarithm of sovereign debt portfolio t		<i>EBA exercises</i>
Sovereign yield	Sovereign yield t		<i>OECD Data</i>
Forecast sovereign yield	Ten-year forward sovereign yield forecast.		<i>OECD Data</i>

Data availability

We collected data from public sources including Bloomberg, European Banking Authority stress-tests and transparency-exercises, European Central Bank, IMF Economic Outlook, OECD Data, and World Bank Economic Indicators. We remain available to share the data and the code upon your request. All authors had access to the data and were involved in the analysis.

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