Does sovereign accounting quality matter?

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Abstract: This paper investigates the accounting quality of sovereign financial reporting. Eurostat, a division of the European Commission, monitors fiscal reporting quality and issues assessments and reservations on fiscal accounting quality to member states of the European Union (EU). Using a sample covering 27 EU countries from 2004-2018, we find that Eurostat is more likely to issue reservations (i) when a country's accounts include high stock flow adjustments, which represent the difference between changes in debt and deficit scaled by Gross Domestic Product (GDP); and (ii) for countries in worse economic conditions. Sovereign bond ratings changes do not predict or incorporate reservations after controlling for economic indicators. However, sovereign bond yields abnormally increase during the reservation announcement window, especially (i) when reservations explicitly mention deficit or debt; (ii) when such impact is quantified; and (iii) for countries that contributed to the European sovereign debt crisis of 2009-2012. Overall, our study contributes to the understanding of the reporting quality of fiscal data.

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Does sovereign accounting quality matter?

1. Introduction

This paper seeks to investigate whether concerns about fiscal accounting quality of sovereign entities are reflected in debt ratings and debt investors. Sovereign debt represents a significant financial asset class that is under-studied in the accounting literature. In 2020, $83.5 trillion of sovereign debt was outstanding, and that amount is equivalent to 98.6% of global GDP (International Monetary Fund 2021). Sovereign bonds are generally, but not always, guaranteed by the countries that issue them (Shleifer 2003). Major investors of sovereign debt in advanced economies include domestic and foreign central banks, domestic and foreign banks, as well as domestic and foreign institutional investors such as pension funds (Arslanalp and Tsuda 2012). Thus, the creditworthiness and performance of this asset class plays an important role in general economic health and stability. Countries account for their economic activities through national accounting of fiscal data. Independent national statistical institutes (SIs) produce and publish fiscal data which is then audited by independent national supreme audit institutions (SAIs). While the literature suggests that accounting quality is important for corporate debt contracting (e.g., Bharath et al. 2008; Graham et al. 2008) and for local government debt costs (Baber et al. 2013), existing evidence is unclear on whether accounting quality of sovereign financial reporting matters.

On the one hand, it is possible that sovereign accounting quality does not matter as much as corporate and local government accounting quality, because sovereign default in recent decades tends to be concentrated in a few known "serial default" countries (Tomz and Wright 2013). Moreover, the

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practitioner literature has stated that the quality of sovereign reporting is of worse quality than those of corporates partly because the usual checks and balances on corporate reporting such as an independent standard setter, short sellers, proxy advisors, auditors, sell and buy side analysts are often missing or ineffective in the context of government reporting (Bernstein et al. 2020).[1]

On the other hand, creditors in the sovereign debt market tend to have fewer rights and debt renegotiations are much more protracted and costly than those in the corporate and debt markets (Shleifer 2003). Furthermore, some countries are bound by constitutional deficit limits or international rules such as the stability and growth pact (SGP) imposed by the European Commission, which impose limits on official fiscal data as well as certain obligations to maintain debit and deficit ceilings.[2] The SGP involves both preventive measures in terms of guidance and monitoring, as well as corrective measures in the form of Excessive Deficit Procedures (EDP) launched against non-compliant member states.[3] Thus EU countries have strong incentives to fulfill these obligations, and these incentives may lead to using creative accounting to appear compliant (Bernoth and Wolff 2008). Following this line of reasoning, investors and debt rating agencies, should ex-ante, care about verifying the reported fiscal

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[1] https://www.forbes.com/sites/shivaramrajgopal/2021/01/04/the-sovereign-debt-market-ignores-fundamentals/?sh=3099cd997097, https://thehill.com/opinion/finance/407633-think-our-20-trillion-debt-is-bad-get-a-load-of-the-real-number,

[2] It is important to distinguish debt from deficits in the context of sovereign reporting. Most governments follow cash accounting or at best some version of hybrid accounting that includes aspects of accrual accounting. Deficits refer to the excess of cash spending-based payments over cash revenue receipts. The deficit is financed by issuing government debt. This distinction matters because accrual-accounting based debt can be orders of magnitude larger than cash or hybrid-accounting based deficits. Deficits tend to attract far more media attention than accrual based debt numbers.

[3] Member states in EDP are initially given a deadline of six months (three for serious breach) to comply with EC recommendations to correct their excessive deficit within a set timeframe. Failure to comply may lead to economic sanctions.

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health of the countries that are behind their sovereign debt investments. Thus, it is an open question whether sovereign accounting quality should matter to investors and information intermediaries such as credit rating agencies (CRAs).

One of the reasons for the lack of existing research into the importance of sovereign accounting quality is the difficulty in reliably measuring such quality (e.g., Bernoth and Wolff 2008; Seiferling 2013). We exploit a special feature in the European regulatory environment to study this question. In the European Union (EU), the national accounting of member states is further subject to routine monitoring and scrutiny by a dedicated division of the European Commission (EC) called Eurostat. Eurostat discloses bi-annual assessments on the quality of fiscal data reported by member states, issues reservations on specific national accounting issues, and sometimes requires countries to amend affected data.[4] This independent body tasked with monitoring and assessment of fiscal accounting quality is unique in the world, and the reservations issued by Eurostat share similar features with the comment letters and enforcement actions released by the Securities and Exchange Commission (SEC) which are related to corporate accounting quality in an established body of accounting literature (e.g., (Dechow et al. 1996; Dechow et al. 2011; Dechow et al. 2016; Naughton et al. 2018).[5]

Eurostat has published bi-annual assessments of fiscal accounting quality of EU member states

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[4] For ease of exposition, we term both reservations and amendments issued by Eurostat as reservations except when we discuss amendments separately.

[5] Note that some SEC comment letters relate to simple clarifications and do not relate to earnings manipulation, while Eurostat reservations are issued after Eurostat having started a conversation about the validity of a country's fiscal reporting with the national SI and clearly relate to identified accounting issues. SEC enforcement actions generally result in large fines while Eurostat reservations do not. However, Eurostat has the power to unilaterally restate an EU member state's fiscal data, which may result in the country violating EC fiscal rules such as debt and deficit ceilings.

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since 2004. We hand collect details on 88 reservations on accounting quality deficiencies issued by Eurostat for the period 2004-2018. In these reservations, Eurostat may, for example, question the reported deficit (income statement) figures by suggesting downward revisions of tax revenues, under-recording of military expenditures, payments from or to the EU budget, or dividends paid by state owned corporations. Eurostat may also question the reported debt (balance sheet) figures by challenging capitalized interest figures or asset values by social security funds. Other accounts unrelated to debt or deficit may also be questioned. For example, some reservations question the recording of receivables and payables accounts as well as the accounting treatment of certain contracts. We use this data to empirically investigate three related research questions: 1) what fiscal accounting quality, economic indicators and national governance characteristics are related to the issuance of reservations by Eurostat? 2) do ratings agencies incorporate Eurostat reservations by updating their ratings? 3) do investors find new and material information in Eurostat reservations?

To answer the first research question, we test the likelihood of a country receiving a Eurostat reservation on existing indicators of fiscal accounting quality, economic indicators, fiscal governance characteristics, as well as prior sovereign bond ratings. The first indicator of fiscal accounting quality is stock flow adjustments (SFAs), which represent the difference between the reported annual change in debt levels and the reported deficits and captures all events that affect the debt level without being recorded in the deficit. Some studies suggest that high levels of SFAs indicate the presence of creative accounting in fiscal reporting (Bernoth and Wolff 2008; von Hagen and Wolff 2006). However, just like accruals are a noisy signal of corporate earnings manipulation (see Dechow et al., 2010, for an

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review of the literature), SFAs are a noisy proxy for fiscal creative accounting because many events that have an effect on debt levels without being recorded in the budget result from purely technical adjustments that do not necessarily reflect a deliberate attempt in creative accounting.[6] Also similar to accruals, SFAs typically reverse over time and may not indicate inferior fiscal accounting quality (European Commission 2003; Seiferling 2013). Our empirical evidence suggests that Eurostat is more likely to issue reservations when countries have high levels of SFAs and provides support for the notion that fiscal accounting quality is lower when fiscal debt levels grow faster than deficit levels. Another existing measure of fiscal accounting quality is the level of sovereign guarantees which are not accounted as debt on the balance sheet but may be costly to the governments that back them (Mody and Patro 1996; Koen and Noord 2005; Bernoth and Wolff 2008).[7]

We do not find evidence to support the idea that Eurostat revisions are related to a country's level of off-balance-sheet guarantees. The empirical findings suggest that just like enforcement actions by the SEC are related to accruals but have the advantage of signaling unequivocal corporate earnings manipulation, reservations by Eurostat are related to SFAs but have the additional benefit of indicating unambiguous fiscal reporting manipulation. Furthermore, Eurostat reservations have an additional advantageous feature in that while the SEC does not routinely check every listed firm's financials in

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[6] For example, a positive SFA resulting from building up assets is unrelated to intentional manipulation and is unrelated to fiscal financial health.

[7] Guarantees are arrangements so that if a borrower defaults, a guarantor will make good the loss a lender would otherwise suffer. They are contingent liabilities as they are potential liabilities which are not reflected on the balance sheet (https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Contingent_liabilities_and_non-performing_loans_-_statistics&oldid=550070#Overview_of_contingent_liabilities) and do not affect the debt ceiling requirements from the Maastricht treaty.

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order to issue enforcement actions, Eurostat checks and issues commentary on the fiscal reporting quality of every member state on a bi-annual basis. The results on the relation between existing measures of fiscal accounting quality and the likelihood of receiving reservations are robust with or without country fixed effects in our regression design.

Given the constraints on reported debt and deficit figures imposed by the EC, we further investigate whether Eurostat reservations are more likely to occur when the member states have greater incentives to use creative accounting, i.e., when they carry high debt and deficit levels and suffer lower economic (GDP) growth. We find that without country fixed effects, Eurostat is more likely to issue reservations when a country has higher debt and deficit levels and lower gross economic product (GDP) growth. Not surprisingly, as fiscal characteristics tend to be sticky within countries over time, these results are no longer statistically significant once country fixed effects are introduced. We also test but do not find that Eurostat revisions are related to sovereign governance and disclosure quality proxies including fiscal transparency, public trust, irregular payments or bribes, efficiency of government spending, or the diversion of public funds. We interpret these null results with caution, as we have a small sample, and the sovereign governance environment is relatively homogeneous within EU member states, by design. While we do not find empirical evidence to support that governance and reporting environmental factors are related to the likelihood of a country receiving a Eurostat reservation, it is possible that fiscal accounting quality is related to sovereign governance indicators in global studies where there is more variation in governance quality. Finally, we examine and do not find that prior sovereign ratings predict future Eurostat reservations.

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Next, we investigate whether ratings agencies revise their sovereign bond ratings in response to Eurostat reservations. Existing research suggests that ratings agencies incorporate fiscal economic data including prior default history in their sovereign bond ratings, and that investors react to sovereign bond ratings changes (e.g., Cantor and Packer 1996; Afonso 2003). However, it is an open empirical question whether ratings agencies care about fiscal reporting quality when issuing sovereign bond ratings. Existing research suggests that sovereign credit ratings are slow to update and are only changed when there is substantial evidence of significant economic turmoil or long term changes in economic fundamentals (Kiff et al. 2012; Slapnik and Lončarski 2021). In addition, CRAs may engage in catering behavior in the sovereign bond setting where the majority of ratings are solicited, i.e., paid by the issuing countries (Klusak et al. 2022). Therefore, we predict and find that credit ratings do not respond in a timely fashion after the issuance of Eurostat reservations.

Finally, we investigate and find that investors do care about fiscal accounting quality. Sovereign bonds experience abnormally higher yields around the announcement windows of Eurostat reservations, after controlling for SFA levels and country fixed effects.[8] This effect is concentrated in newly expressed reservations, which constitute new information to the market, rather than Eurostat maintaining existing reservations that the named member states are yet to correct. We do not find a

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[8] We also investigated whether CDS spreads respond to reservations the same way as yields. We find that CDS spreads are not as sensitive as yields in that they only respond to those reservations that explicitly mention debt or deficit concerns. Our results are consistent with the finding by European Central Bank researchers that sovereign debt CDS spreads do not fully reflect the movement of sovereign debt yields (Fontana and Scheicher, Martin 2010). In our sample, the correlation between CDS spreads and sovereign debt yields averages 0.65 but ranges from a low of -0.08 for Sweden and a high of 0.93 for Cyprus. The correlation also varies across time with a low of 0.46 in 2004 and a high of 0.92 in 2013.

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statistically significant market reaction when reservations are withdrawn. Our empirical results are consistent with the notion that when first issued, reservations constitute new information to the market. However, the market is likely able to anticipate the eventual corrections in fiscal reporting and when reservations are withdrawn.

We further hypothesize and find that investors care more about the information contained in Eurostat reservations when they (i) explicitly mention debt or deficit; and (ii) when they quantify the financial impact. We also find that the market reaction is not equal across all EU member states. Debt investors react more when perceived sovereign debt riskiness is higher, that is, when reservations are issued against Greece, Ireland, Italy, and Portugal (GIIPS), the group of countries that constituted the European sovereign debt crisis in 2009-12. In addition, we find that investors react differently across our sample period. In line with the notion that investors are more aware of the link between fiscal accounting quality and sovereign debt riskiness, we find that investors care more about the quality of fiscal reporting after the start of the European sovereign debt crisis.

Our paper contributes to the literature in several ways. First, we exploit the unique setting in the EU to identify an unambiguous proxy for fiscal accounting quality and thereby extend the sparse academic literature on creative fiscal accounting. Second, we contribute to the literature on credit ratings agencies (CRAs) by providing empirical evidence that sovereign credit ratings do not seem to anticipate Eurostat reservations. In addition, we find that information contained in fiscal accounting quality assessments by an EC agency specifically tasked with evaluating the fiscal reporting quality of all EU member states does not appear to drive ratings changes of sovereign debt. Interviews with EU

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officials reveal that credit rating agencies rely on future forecasts of the economy published by ministries of finance of the respective countries and these forecasts tend to be optimistic than eventual realizations.

Third, given the importance of sovereign debt instruments to the global financial markets, we contribute to the literature's understanding of whether fiscal accounting quality matters to investors. Our evidence suggests that the Eurostat reservations provide novel information to investors in their assessment of sovereign credit risk, and that the information is more relevant when the reservations are more severe in nature, and when they relate to countries with higher sovereign debt riskiness.

2. Institutional Background and Hypotheses Development

2.1. Institutional Background

The literature documents that corporate debt and equity investors care about corporate financial reporting quality because the accuracy of a firm's reported earnings, cash flows, assets and liabilities has a significant impact on the firm's ability to pay off both interest and principal of its loans and its equity valuation (e.g., Bharath et al. 2008; Graham et al. 2008; (Dechow et al. 2010). In the corporate setting, there are well established internal and external checks and balances put in place to monitor corporate accounting quality. Internally, governance mechanisms such as the audit committee of the board oversee the quality of a firm's financial reporting. Externally, an independent auditor audits the reported financial statements according to a set of rules made by either national or international

standard setters (or both if the company is cross listed).[9] In addition, national regulators such as the SEC in the US monitor the quality of financial reporting of firms with publicly listed securities. Moreover, sell side analysts, financial journalists, short sellers, activist investors actively monitor and publicize incidents of earnings manipulation or financial fraud (e.g., (Desai et al. 2006; Ferri and Sandino 2009; Lehavy et al. 2011). In case of default, at least in the US, creditors still have significant rights thanks to the Chapter 11 corporate bankruptcy process (Krueger 2002).

In contrast, the institutional setting is very different for sovereign financial reporting. While the producer and auditor of fiscal data are both meant to be institutions independent from the government at least in democratic countries, they are nevertheless liable to come under pressure from politicians and civil servants. For example, (Dafflon and Rossi 1999) document that a number of countries, such as Greece and Italy, used accounting tricks in their fiscal reporting to qualify joining the European Union. This evidence lends support to the notion that national SIs succumb to political pressure and manage the reporting of fiscal data. More recently, the former head of the Hellenic Statistical Authority (ELSTAT), Andreas Georgiou, who after repeated concerns raised by Eurostat corrected the grossly underreported debt and deficit figures for Greece in 2010, has been prosecuted by the current Greek government for "inflating" the 2009 fiscal deficit which precipitated the European sovereign debt crisis and led to externally imposed austerity measures in Greece. Except for the EU setting further elaborated in section 2.2., there are no supranational regulators or other governance mechanisms to

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[9] For example, Generally Accepted Accounting Principles (GAAP) set by the Financial Accounting Standards Board (FASB) in the US and the International Financial Reporting Standards (IFRS) set by the International Accounting Standards Board (IASB) that apply to most countries in the world except the US.

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oversee fiscal accounting quality. Short selling of sovereign debt is often restricted and therefore does not serve well as a market-based governance mechanism. For example, the European Securities and Markets Authority prohibits uncovered short selling of sovereign debt.

In case of default, creditors in sovereign debt have few rights (Bulow and Rogoff 1989a; Bulow and Rogoff 1989b; Shleifer 2003). Countries can default unilaterally without consulting creditors. Debt renegotiations are protracted and involve costly lawsuits. There are limited avenues by which creditors can claim assets of a country. [10] Unlike the corporate setting, management (i.e., the national government) cannot be replaced by activist investors. Moreover, institutional investors such as pension funds, national banks and insurance firms are often required to hold sovereign debt. Thus, the quality of fiscal reporting is probably even more salient than the importance of accounting quality in the corporate setting.

2.2. The European Setting

Against the backdrop outlined in section 2.1. above, the European setting provides a unique opportunity for researchers to study whether fiscal accounting quality matters. The EC imposes a number of fiscal rules on its member states. First, to qualify for membership, countries must be able to demonstrate that they can establish a sustainable budgetary position according to the so-called Maastricht Treaty criteria (Dafflon and Rossi 1999). After joining the union, the member states are

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[10] A rare exception is sovereign bondholders' seizure of a 100-meter Argentine naval vessel docked in the Ghanian port of Tema during the Argentine sovereign crisis (https://www.economist.com/the-americas/2020/05/23/argentina-defaults-yet-again-but-hopes-to-get-off-lightly).

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subject to additional fiscal constraints such as 1) the EDP which requires them to maintain a deficit-to-GDP ceiling of 3% and a debt-to-GDP ceiling of 60 %; and 2) the SGP, which is a further requirement under the EDP that demands EU countries to aim for a medium-term surplus or close-to-surplus budgetary position (Dafflon and Rossi 1999). Given these fiscal constraints and the resulting incentives for member states to manipulate their fiscal reporting in order to comply, the EC has imposed additional regulations on the reporting of sovereign financial reporting and has tasked Eurostat to collect, publish, and assess the quality of the data.

Independent national SIs are responsible for the production and publication of sovereign financial reporting. In the EU, national SIs extract state and local governmental accounting information which is based either on a partial accrual or cash basis depending on the country, and convert it to report standardized statistical "deficit" and "debt" measures which are based on the European System of Accounts (ESA), which is accrual based, to Eurostat (Jorge et al. 2016; Caruana and Grima 2019).[11] The member states report initial and revised annual figures for the past four fiscal years, twice a year. For example, the fiscal data for the year 2004 will be reported twice in 2005, 2006, 2007, and 2008. The initially reported 2004 figures tend to be rougher estimates which are then revised due to revisions in the underlying statistical sources, errors and omissions, changes to the interpretation or clarifications of rules. On behalf of the EC and as part of the EDP, Eurostat is responsible for disseminating the data

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[11] In 2013 across 27 EU countries, nine countries (33%) report local governmental budgets based on IPSAS, the accrual based accounting system for local governmental accounting (Jorge et al. 2016). The same study reports that 12 countries (44%) report local governmental accounting using the cash basis and the rest of the countries use some elements of both.

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reported by national SIs and for assessing the quality of the reported data.[12]

Eurostat publishes the results of these assessments in the form of bi-annual press releases, usually in April and October, on each member state's reported deficit and debt figures for the prior four years (see for example, Eurostat, 2021). It also publicly communicates any 'qualified' positions it takes on member states' data on deficit and debt by issuing reservations. In some circumstances, Eurostat may also decide to directly amend a member state's data on deficit and debt (amendments). Reservations are signaled *on* reported data whereas amendments are made *to* reported data. Our study focuses on the publication of the communication of qualified positions on fiscal data reporting through the issuance of reservations and amendments. While the news releases also contain the reporting of deficit and debt figures of the member states, these figures are typically independently published by the member states beforehand. Therefore, ratings changes by CRAs and market reaction in sovereign bond yields after the issuance of reservations, if any, are attributable to the Eurostat's assessment of financial reporting quality rather than the debt or deficit figures themselves.

In summary, the EU offers a uniquely advantageous setting to study whether sovereign accounting quality matters. Not only does the EC impose fiscal regulations that may incentivize accounting

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[12] According to the Quality report on National and Regional Accounts (Eurostat 2021), Eurostat verifies the following criteria when assessing the quality of the sovereign fiscal accounting data (interchangeably termed "statistical data") transmitted by member states: 1) compliance with ESA accounting rules by the national reporting authorities; 2) the exhaustiveness of the coverage of the general government sector; 3) the quality of the "EDP inventories of methods, procedures and sources"; 4) the reliability, timeliness and consistency of the statistical data; 5) the consistency, sustainability, transparency, documentation and control of the EDP compilation processes within national statistical authorities, 6) the conformity of these processes with the European Statistics Code of Practice (ESCP); and 7) the degree of assurance provided by internal controls and external audits by supreme audit institutions or other external audit bodies of the quality of public accounts used as inputs to the EDP compilation processes.

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manipulations on the part of its member states in order for them to enter and remain in the union, but it also has created a supranational agency, Eurostat, to routinely monitor and publish independent and authoritative assessments of the sovereign fiscal quality on each of the EU member states.

2.3 Determinants of Eurostat Reservations

While to our knowledge we are the first academic study to introduce Eurostat reservations as an unambiguous proxy of sovereign accounting quality for EU countries, existing research, published usually by the IMF and the World Bank, examines the quality of fiscal data using noisy empirical measures which include SFAs (von Hagen and Wolff 2006; Bernoth and Wolff 2008; Seiferling 2013) and off-balance sheet items such as guarantees (Mody and Patro 1996; Dafflon and Rossi 1999; Koen and Noord 2005). As explained earlier in the introduction, just like their parallels in corporate accounting, accruals and off-balance-sheet items, higher figures in SFAs and off-balance-sheet items do not necessarily indicate intentional accounting manipulation. For example, Seiferling (2013) argues that SFAs reflect technical corrections rather than intentional manipulation, contrary to the conclusions of other researchers (von Hagen and Wolff 2006; Bernoth and Wolff 2008). Nevertheless, we expect that Eurostat is, on average, more likely to issue reservations to countries that have report SFA and guarantees figures. Because sovereign accounting data is first disclosed but then revised for several years into the future, some studies suggest that the quality of fiscal accounting is lower in the initially reported figures rather than in revised numbers (Koen and Noord 2005; De Castro et al. 2013). Therefore, we expect that Eurostat is more likely to issue reservations to countries that report a high

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number of revisions.

Through the SGP and the EDP regulations discussed previously, the EC imposes constraints on a member state's debt and deficit figures. We conjecture that there are more incentives for a member state to manipulate its accounting when their debt and deficit figures are high and while their economic (GDP) growth is lower. In addition, analytical research suggests that fiscal transparency affects the likelihood of fiscal accounting manipulation (Milesi-Ferretti 2004) and this analytical finding was studied empirically using SFAs as the measure of fiscal accounting quality (Alt et al. 2012). Therefore, we also investigate whether Eurostat is more likely to issue reservations if the sovereign governance and disclosure environment is less favorable.

Taken together, we hypothesize that Eurostat is more likely to issue reservations when other proxies of fiscal accounting quality are high, when there are more incentives to manipulate the sovereign accounts, and when the sovereign governance and disclosure environment is less favorable.

2.4. Do CRAs Use Information Contained in Eurostat Reservations?

Prior research suggests that CRAs incorporate fiscal economic data, such as GDP per capita, external debt, level of economic development, real growth rate, inflation rate, and prior default history in their sovereign bond ratings (Cantor and Packer 1996; Afonso 2003). This line of research also provides evidence that investors react to sovereign ratings changes, suggesting that the ratings changes contain new information for the market (Aizenman et al. 2013; Baum et al. 2016). However, it is an open question whether CRAs qualify the reliability of the fiscal economic data used in their ratings

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generation process. On the one hand, given the incentives facing EU member states to report economic data that enable them to comply with the EC's fiscal health constraints, it is reasonable for CRAs to consider the reporting quality of the fiscal economic data they use to generate their ratings. On the other hand, CRAs generally assign ratings on a through-the-business cycle basis. Through-the-cycle ratings do not react to changes of the borrower's current economic situation but only to changes of their "permanent" attributes (Altman and Rijken 2004). Existing research suggests that sovereign credit ratings are based on through-the-business cycle philosophy and predicts that issuers can withstand potential economic turmoil and are not likely to be changed unless economic fundamentals change (Kiff et al. 2012; Slapnik and Lončarski 2021). In addition, there might be other incentives for CRAs to wait for downgrades facing negative news about a country's fiscal reporting from Eurostat. Most sovereign bond ratings are solicited, i.e., the issuers pay for ratings. Existing research supports the notion that CRAs engage in catering behavior to win solicited ratings (Griffin and Tang 2011; Kraft 2015). Recent research suggests that the first CRA to downgrade a sovereign bond rating is more likely to have its paid contract cancelled by the sovereign issuer (Klusak et al. 2022). Following this line of reasoning, we predict that CRAs are unlikely to change sovereign bond ratings as a group in a timely fashion following Eurostat reservations.

2.5. Do Investors Use Information Contained in Eurostat Reservations?

There is an established literature that suggests that accounting quality is important for corporate debt contracting (e.g., Bharath et al. 2008; Graham et al. 2008). In addition, using restatements as

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proxy for poor municipal government accounting, Baber et al. (2013) find that local government accounting quality matters to municipal bond investors. Following this line of reasoning, accounting quality of sovereign financial reporting should matter to sovereign bond investors too. It is possible that accounting quality is especially salient in this setting as creditors in the sovereign debt market tend to have fewer rights and debt renegotiations are much more protracted and costly than those in the corporate and debt markets (Shleifer 2003). Furthermore, as discussed above, some countries are bound by constitutional deficit limits or international deficit or debt ceilings such as the EC's SGP and EDP procedures and the excessive deficit procedure (EDP). Therefore, the incentives for manipulating fiscal financial reporting in order to stay within EC rules could be strong.

However, it is also possible that sovereign accounting quality does not matter as much as corporate and local government accounting quality, as sovereign default in recent decades tends to be concentrated in a few known "serial default" countries (Tomz and Wright 2013). Taking into consideration both sides of the argument and the importance of the sovereign debt market, we predict that abnormal sovereign bond yields for countries that receive Eurostat reservations on fiscal reporting quality should increase at the announcement of the reservations.

We further predict that investors are more likely to care about 1) reservations that are newly expressed, as they are more likely to contain new information; 2) relevant reservations that specify impact on debt or deficit levels; 3) more precise reservations that quantify impact; initial rather than revised fiscal data as initial data is more likely to be wrong; 4) reservations issued at or after the start of the European sovereign debt crisis as investors are more likely to appreciate the importance of

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sovereign fiscal quality; 5) reservations against the so-called GIIPS (Greece, Ireland, Italy, Portugal, and Spain) countries as their debt is perceived as risky.

3. Our Sample

Our sample covers all 27 EU member states for the 2004-2018 period. We hand collect reservations, SFA, guarantees, public debt, public deficit/surplus data from Eurostat. For sovereign bond yields, we use the 10-year government bond, end-of-day yield data from Thomson Reuters. Our GDP growth data comes from the World Economic Outlook (WEO) database from the International Monetary Fund (IMF). Sovereign credit ratings data covers all three major CRAs, namely S&P, Moody's, and Fitch. Our sovereign governance and disclosure environment variables come from an Executive Opinion Survey produced by the World Economic Forum to compute their Global Competitiveness Index.

Table 1 describes our sample of 67 events covering a sample period of 2004-2018 that we use to test our first hypothesis regarding the market reactions of reservations at announcement. Panel A of Table 1 describes our sample selection methodology. We follow a six-step procedure to build our event dataset. First, we manually retrieve all existing semi-annual publications on reservations from Eurostat's website. We identify 88 events across the 31 publications from September 2004 (date of first ever issuance of reservations by Eurostat) to end of 2018. In a second stage, we drop five events conveying non-negative news as the spirt of the reservations is mainly to discuss errors or inconsistencies in sovereign fiscal reporting. Thirdly, we drop one observation about Germany as

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following extensive literature on European sovereign debt, Germany serves as the benchmark for our CAR model and therefore it is impossible to match German abnormal yields to a reservation issued against Germany. In the fourth stage, we drop 10 duplicate observations. In the fifth and sixth stage, we drop events for which we have no associated market data at all (fifth stage) or no associated market data on the event day or in the event window (sixth stage). This selection procedure leads us to a final sample of 67 events in the sample period of 2004-2018.

Panel A of Appendix C provides examples of the wording of the reservations. We select several examples to introduce the reader to representative content in Eurostat reservations. Event 12 details a reservation issued against France in April 2018. In this reservation, doubts are raised against the classification of a capital transfer that would impact the deficit, as well as including the liabilities of a French international development agency as part of the national debt. The impact of the concerns is enumerated in the reservation. This example suggests that the source of the accounting problem is improper accounting of public corporations, and the impact is on both debt (balance sheet) and deficit (income statement) levels. Event 18 details a reservation issued against Greece in April 2010. The reservation details concern over the reporting of the surplus from social security funds and classification of certain liabilities, resulting in increase in deficit and debt figures. A numerical range of the potential impact is estimated in the release. In this example, the source of the accounting problem comes from improper accounting of public entities, and the problem affects both the reported deficit (income statement) and debt (balance sheet) figures. Event 19 is a reservation issued against Hungary on April 21, 2016, charging that the Hungarian Export Import Bank should have been classified within

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national fiscal accounting which would have resulted in an increase in debt levels. In this reservation, there are no numerical details. The source of accounting error is bank capital injections, and the impact is on reported debt (balance sheet) figures.

Panel B and Panel C of Appendix C summarize the most common issues raised by Eurostat reservations. Inappropriate accounting of public corporations (34%) and public entities (30%), as well as of bank capital injections (27%), account for the top three types of complaints detailed in the reservations. In addition, the income statement (deficit or surplus) is affected 63% of the time and the balance sheet (debt or other balance sheet items such as working capital accounts) is affected 58% of the time. Note that these figures are not meant to add up to 100% as most reservations cover more than one category.

Panel B of Table 1 summarizes the distribution of the events across EU member states, which include Austria, Belgium, Bulgaria, Cyprus, Czechia, Denmark, France, Germany, Greece, Hungary, Ireland, Italy, Luxembourg, Netherlands, Portugal, Romania and the United Kingdom (UK). Figure 1 represents the same distribution on a map. We only include observations after countries joining the EU.[13] Out of the 27 EU member states, 16 have at least one reservation or amendment in our sample period. Figure 2 illustrates the timeline of reservations received by country. The UK has received 13 reservations although only three of which contained newly expressed information. The reservations were maintained in subsequent periods because the UK did not respond to them in a timely manner. Economically, the UK has never been part of the European Monetary Union (EMU) and therefore has

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[13] Bulgaria and Romanian joined the EU in January 2007 and Croatia in July 2013.

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kept its own currency and central bank. Therefore, the UK may not be as concerned about the possible

economic consequences of fiscal reporting to the EC.

Greece has received 11 reservations out of which five were expressed, three were maintained and

three were withdrawn. Greece was the first country to receive a reservation from the EU in September

2004 and had received all its reservations from 2004 and 2010 (Figure 2). In October 2009 and in April

2010, Eurostat issued reservations concerning Greek fiscal accounts (see Appendix C) and Greece had

to revise its debt and deficit data which ran afoul of EDP debt and deficit ceilings by a large margin.[14]

As a result, investors started to lose confidence in the reliability of Greek fiscal data and to question

the real sovereign debt riskiness of the country. From our bond yields data, we observe that Greek

sovereign bond yields increased by 56% in the 12 months following the October 2009 reservation. By

issuing reservations consistently from 2004 to 2010, Eurostat had been signalling their concern about

Greek fiscal accounting quality for six years leading up to the European sovereign debt crisis. Apart

from the UK and Greece, other reservations are broadly distributed across EU countries.[15]

Panel C of Table 1 tabulates the distribution of reservations by year. Reservations are generally

evenly distributed across our sample. Panel D of Table 1 suggests that the majority of events are newly

expressed reservations (44.6%) with the rest roughly evenly distributed between maintained (26.2%)

and withdrawn events (29.2%). Note that 75.4% of events are reservations while 24.6% are

amendments. Reservations are signalled *on* reported data whereas amendment are made *to* reported

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[14] See for example, Financial Times (FT) article "History of statistics that failed to add up" on September 30 2011
(https://www.ft.com/content/deeaea88-eb81-11e0-a576-00144feab49a) and FT article "Eurostat's bell tolls for Greek
debt" on April 22, 2010 (https://www.ft.com/content/e3f2815a-1870-3bd9-8975-6ab293a479e1).

[15] Our later empirical results are robust after excluding Greece and the UK.

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data. Note that 55.3% of reservations are more relevant in the sense that they specifically take issue

with either debt or deficit figures. In terms of precision, 44.6% of events are quantified and the rest are

not. In terms of new signals, 58.5% of reservations are against newly reported fiscal data (as opposed

to revised fiscal data) and the rest are against revised data or unknown. Reservations issued before the

start of the European sovereign debt crisis represent 44.6% of the reservations while 55.4% are made

at or after the start of the crisis in October 2009 when Eurostat's reservation against Greece triggered

the crisis. The GIIPS countries account for 29.2% of the reservations. This data thus suggests that

reservations are not mainly targeted at GIIPS countries.

4. Research Design and Empirical Results

4.1. Determinants of Eurostat Reservations

Table 2 presents descriptive statistics for variables used in our tests on the determinants of Eurostat

reservations. Reservations occur for 9% of our observations. The proxies for sovereign accounting

quality from existing literature vary greatly across the sample. SFAs are on average 0.54% of GDP but

the minimum is -35% while the maximum is 15.49% with a standard deviation of 3.27%. Guarantees,

on average, represent 10.64% of GDP and range from 0.02% to 96% with a standard deviation of

15.25%. The average debt is 59.66% of GDP and the average deficit is 2.8% of GDP. These figures

are very close to, but fall within, the Maastricht criteria ceilings of 60% debt as percentage of GDP

and 3% deficit as percentage of GDP. Average GDP growth is 2.27%. While the range for the fiscal

governance and disclosure environment variables, which are rated on a scale from 1 to 7 with 7 being

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of the highest quality, can be wide, the standard deviations of these variables are generally low (mostly below 1 and at maximum 1.27). This is consistent with the notion that the fiscal governance and disclosure environments in the EU are relatively homogeneous.

To answer our first research question, we investigate the determinants of reservations across countries by regressing the indicator variable, *Reservation*, which takes on the value of one if a reservation or amendment is issued by Eurostat for a particular b-annual country observation, on a set of explanatory variables in a pairwise fashion that includes year fixed effects. We then repeat the analysis with the addition of country fixed effects to examine within-country effects. We cluster standard errors by country in all regressions. Our explanatory variables are lagged by one year and include SFA levels as a percentage of GDP and guarantees levels as a percentage of GDP, which are noisy existing sovereign accounting quality proxies.[16]

In addition, we include public debt/surplus levels as a percentage of GDP, and year-on-year GDP growth, which are economic fundamental performance variables. Furthermore, we examine governance and disclosure environment variables that include transparency of government policy making, public trust, irregular payments and bribes, efficiency in government spending, and diversion of public funds. We also investigate whether average outstanding sovereign bond ratings across three major CRAs are related to the issuing country's likelihood to receive a Eurostat reservation.

The pairwise regressions in Table 3, Panel A suggest that across countries, Eurostat is more likely to issue reservations when SFA levels are higher, when public debt and deficit levels are higher, and

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[16] As Eurostat only started providing guarantees data from 2010 onwards, we use the 2010 value for the years 2003-2009.

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when GDP growth is lower. When we regress the likelihood of receiving a Eurostat reservation on these statistically significant explanatory variables together in a single regression, only SFAs remain statistically significant. Panel B of Table 3 repeats the above analysis with the addition of country fixed effects. The results suggest that after controlling for country-specific, time-invariant effects, Eurostat is more likely to issue reservations only when SFA levels are higher. Taken together, our results suggest that Eurostat considers fiscal accounting quality and fundamental economic performance when issuing reservations.

We do not find empirical evidence to support the conjecture that Eurostat takes national governance and reporting environment factors into account. However, we note that ours is a small sample and the proxies we use likely contain measurement error. In addition, the national governance and reporting environment factors across the EU are relatively homogeneous. Finally, our empirical results do not provide support for the notion that sovereign credit ratings anticipate reservations.

4.2. Ratings Impact of Eurostat Reservations

Table 4, Panel A summarizes the sovereign bond ratings across the different countries in our sample. Following existing CRA literature, alphanumeric ratings are into numeric ones by using linear mapping. The top rating (Aaa/AAA) is equivalent to 24 and the lowest rating (D/SD)[17] is equivalent to 1. The average rating over the sample is equal to 19.90 which reflects the general robust economic strength of EU member states. Germany, Denmark, Luxembourg, and Sweden have the highest average

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[17] D stands for Default and SD stands for Selective Default.

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rating of 24 throughout our sample period. Cyprus (15.54) and Greece (12.61) have the lowest average ratings. Given the imminence of a potential default without EU intervention, the minimum rating for Greece is one during the peak of the European sovereign debt crisis.

To answer our second research question, using logistic regressions we examine whether a future ratings downgrade is more likely after Eurostat issues a reservation, after controlling for change in debt, change in deficit, GDP growth, and stock flow adjustments. Future ratings downgrade is an indicator variable that equals one when there is a rating downgrade by any of the three CRAs between the date of the current reservation and the next one.[18] *Reservation* is our variable of interest and is defined as in previous tests. *Change in Public debt* and *Change in Public deficit (-)/surplus (+)* represent, respectively, the change in the value of public debt and the change in the value of the public deficit/surplus, in the year preceding the reservation in the year preceding the reservation.

As predicted, the results in column (1) to (4), Panel B of Table 4 suggest that sovereign credit ratings are more likely to be downgraded after increases in public debt levels and further worsening of public deficits. However, columns (1) to (2) suggest that ratings are not more likely to be downgraded after a reservation. Furthermore, columns (3) to (4) suggest that rating downgrades do not occur for either expressed, maintained or withdrawn reservations. These results are consistent with the notion that sovereign credit ratings are long term measures of national economic fundamentals and that the Eurostat reservations on average do not offer information of high enough magnitude to cause ratings changes. CRAs are known to rate sovereign debt "through-the-cycle," which means CRAs are slow to

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[18] Our results remain unchanged if we increase the downgrade horizon to the next twelve months after the reservation.

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update sovereign ratings in response to portfolio managers demand for stability in ratings. Under the alternate model known as "point in time" system (not followed for sovereign debt), CRAs would update ratings to reflect current information (Kiff et al. 2012)

4.3. Market Reaction to Eurostat Reservations

Table 5 presents the descriptive characteristics of the 1,208 daily sovereign bond yield observations in our sample by country (Panel A) and by year (Panel B). Raw yields are on average the highest in Greece (8.13 bp) and the lowest in Austria (2.47 bp), Malta (2.41 bp) and the Netherlands (2.51 bp). Panel B of Table 5 suggests that not surprisingly, raw yields are on average the highest during the global financial crisis of 2008-2009 and the European sovereign debt crisis in 2009-2012.

To perform our market reaction tests, we first calculate daily abnormal returns (AR) from each event as follows:

$$AR_{i,d} = Y_{i,d} - E(Y_{i,d})$$

where $AR_{i,d}$ is the abnormal return of the yield of country i on day d, $Y_{i,d}$ is the observed yield of country i on day d and $E(Y)_{i,d}$ is the predicted relative variation in yield on this date. We compute the predicted return $E(Y)_{i,d}$ using the following regression:

$$E(Y_{i,d}) = \propto_i + \beta_i . Y_{M,d}$$

where d is taken from our estimation window [-60, -30], $\propto_i$ is the stable component of the yields for the country i and is stable over time, β_i is the beta or a measure of the systematic risk of country i and is stable over time and $Y_{M,d}$ is relative variation in German yield. We choose to base

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our event study on the observed bond yields spreads between country specific bonds and German bonds (see Campbell et al., 1997 for a detailed discussion).[19] When we have the $AR_{i,d}$, the yield market reaction is then computed as the cumulated abnormal return $CAR_i[d_1, d_2]$ from d_1 to day d_2 around the event:

$$CAR_i[d_1, d_2] = \sum_{t=d_1}^{d_2} AR_{i,t}.$$

Figure 3 presents CARs for reservation versus non-reservation events for the [-1, 15] window. The results suggest that the CARs are positive around the reservation event windows and the reaction does not appear to reverse up to 15 days after the event. To test our third research question on whether Eurostat reservations matter to investors, we regress announcement window [0, 1] Cumulative Abnormal Returns (CAR) on *Reservation*, our variable of interest as defined above, and control for SFA, the variable that is related to *Reservation* and may influence yields. The coefficient on *Reservation* captures the market reaction to the issuance of Eurostat reservations. To control for time-invariant country-level effects on CARs, we include country fixed effects. We also cluster standard errors by country. We expect an increase in CAR around the announcement of a Eurostat reservation as the information contained in a reservation presents novel negative information about a country's fiscal accounting quality.

The results in Table 6 are consistent with our hypothesis as the coefficients on *Reservation* in both columns (1) and (3), representing [0,1] and [-1,+1] windows respectively, are positive and statistically significant at 5% confidence levels. We further investigate how the market reacts to different types of

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[19] Afonso et al. (2011) followed the same method to study the impact of rating changes on European sovereign yields.

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reservations and column (3) suggests that the market reaction is mainly concentrated in newly expressed reservations which contain the most novel information (coefficient is positive and statistically significant at 1% confidence levels) though the coefficient on maintaining a previous reservation is also positive and significant at 10% confidence levels. While the overall results are similar across [0,1] and [-1,1] announcement windows, column (4) shows that the coefficient on maintaining a previous reservation is no longer significant for the longer [-1,1] window. This result suggest that some investors can anticipate that Eurostat is to maintain an existing reservation.

Next, we examine whether the market reacts to the content of the reservations. Panel A of Table 7 compares the market reaction across subsamples formed on differences in reservation content. The results in columns (1) and (2) suggest that for the [0,1] window, the coefficient on *Reservation* is only statistically significant if the reservations mention debt or deficit concerns. However, the coefficients are not statistically significantly different across the subsamples according to the F-test with p-value of 0.655. Columns (3) and (4) of Table 7 report that the coefficient on *Reservation* appears to be higher and more economically significant if the reservations quantify the concerns instead of only discussing them qualitatively. However, the coefficients are not statistically significantly different across the subsamples according to the F-test, with a p-value of 0.726.

Columns (5) and (6) of Table 7 report that the coefficient on *Reservation* is statistically significant for both initially released fiscal figures (5% confidence levels) and other figures (10% confidence levels). The difference in coefficients is not statistically significant according to the F-test (p-value of 0.728). Taken together, the results from Panel A of Table 7 provide some evidence to support the notion

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that reservations matter more to investors when they contain more relevant and precise information.

We also investigate whether investors react more to reservations issued to countries that appear to have higher sovereign debt riskiness. Columns (1) and (2) suggest that the economic magnitude of the coefficient on *Reservation* appears to be higher since the beginning of the sovereign debt crisis, suggesting that investors may care more about the importance of fiscal reporting quality after the start of the crisis. However, this evidence needs to be interpreted with caution as the difference in coefficients is not statistically significant according to the F-test (p-value of 0.256). The results in columns (3) and (4) of Table 7 suggest that market reaction to reservations is higher for GIIPS countries, which were likely to have higher sovereign debt riskiness, than the rest of the EU member states. The difference in coefficients is not statistically significant according to the F-test. Taken together, our results provide some support for the notion that investors care more about the information contained in Eurostat reservations when they concern countries with higher sovereign debt riskiness.

In summary, our empirical evidence is consistent with the notion that fiscal accounting quality matters to investors, and that they care more when the quality signal is more relevant or more precise, and when the quality signal concerns countries with higher debt riskiness.

5. Conclusions

Our study exploits a uniquely advantageous setting in the EU to study whether sovereign accounting quality matters. We identify the reservations issued by Eurostat, an agency tasked with monitoring and assessing the financial reporting quality of the EU member states, as an unambiguous

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proxy for inferior fiscal accounting quality. Using a sample covering 27 EU countries from 2004-2018, we investigate whether Eurostat reservations are related to other existing measures of sovereign accounting quality, economic indicators, as well as sovereign governance and disclosure environments. Our evidence suggests that Eurostat is more likely to issue reservations when a country's accounts include SFAs but not off-balance-sheet governmental guarantees. We also find that countries in worse economic conditions, i.e., with higher debt and deficit and lower economic growth, are more likely to receive Eurostat reservations. As the governance and disclosure environments of EU states are relatively homogeneous and we have a relatively small sample, we do not find evidence to support a link between these environmental factors having a significant impact on the likelihood of receiving Eurostat reservations.

Our empirical results suggest that sovereign bond ratings do not incorporate reservations in a timely manner. However, sovereign accounting quality appears to matter to investors, as bond yields abnormally increase during the reservation announcement window. This evidence suggests that reservations offer novel and economically impactful information about the fiscal health of the affected countries. Our results also indicate that the market reacts more to reservations are more relevant and precise. We find that the market reaction is stronger for countries with higher sovereign debt riskiness and that we the market reaction is concentrated in the sample periods prior to and after the crisis.

Our European setting offers several advantages. The sovereign statistical measures are produced under the same ESAs rules as required by the EC, and the homogeneous standards leads to more comparability in a cross-country setting. In addition, the EC's constraints regarding debt and deficit

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ceilings on member states provide potential incentives for certain countries to resort to creative accounting in order to stay within the regulations. Importantly, Eurostat is a unique supranational authority that is tasked with monitoring and assessing accounting quality of EU countries.

However, a disadvantage of the EU setting is that there is not much variation in the member states' governance and reporting transparency environments. Most of the findings from this study are likely to be generalizable to the rest of the world, as the relative homogeneity within EU member states goes against us finding statistically significant results. Thus, our main findings are likely to be even stronger in a global setting where cross-country variations will be larger. Our main contribution is to empirically examine whether sovereign accounting quality is informative to market participants. Future research might want to further explore the relation between sovereign governance and disclosure environments and fiscal accounting quality in a global setting where cross-country variation is more significant.

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References

Afonso, A. 2003. Understanding the determinants of sovereign debt ratings: Evidence for the two leading agencies. *Journal of Economics and Finance* 27 (1): 56–74.

Aizenman, J., M. Binici, and M. Hutchison. 2013. Credit ratings and the pricing of sovereign debt during the euro crisis. *Oxford Review of Economic Policy* 29 (3): 582–609.

Alt, J. E., D. D. Lassen, and J. Wehner. 2012. *Moral Hazard in an Economic Union: Politics, Economics, and Fiscal Gimmickry in Europe*. SSRN Scholarly Paper. Rochester, NY: Social Science Research Network.

Altman, E. I., and H. A. Rijken. 2004. How rating agencies achieve rating stability. *Journal of Banking & Finance* 28 (11). Recent Research on Credit Ratings: 2679–2714.

Arslanalp, S., and T. Tsuda. 2012. Tracking Global Demand for Advanced Economy Sovereign Debt. *International Monetary Fund Working Papers Series*. 12/284.

Baber, W. R., A. K. Gore, K. T. Rich, and J. X. Zhang. 2013. Accounting restatements, governance and municipal debt financing. *Journal of Accounting and Economics* 56 (2): 212–227.

Baum, C. F., D. Schäfer, and A. Stephan. 2016. Credit rating agency downgrades and the Eurozone sovereign debt crises. *Journal of Financial Stability* 24: 117–131.

Bernoth, K., and G. B. Wolff. 2008. Fool the Markets? Creative Accounting, Fiscal Transparency and Sovereign Risk Premia. *Scottish Journal of Political Economy* 55 (4): 465–487.

Bharath, S. T., J. Sunder, and S. V. Sunder. 2008. Accounting Quality and Debt Contracting. *The Accounting Review* 83 (1): 1–28.

Bulow, J., and K. Rogoff. 1989a. A Constant Recontracting Model of Sovereign Debt. *Journal of Political Economy* 97 (1): 155–178.

———. 1989b. Sovereign Debt: Is to Forgive to Forget? *The American Economic Review* 79 (1): 43–50.

Cantor, R., and F. Packer. 1996. Determinants and Impact of Sovereign Credit Ratings: 18.

Caruana, J., and L. Grima. 2019. IPSAS, ESA and the fiscal deficit—a question of calibration. *Public Money & Management* 39 (2): 113–122.

Dafflon, B., and S. Rossi. 1999. Public Accounting Fudges towards EMU: A First Empirical Survey and Some Public Choice Considerations. *Public Choice* 101 (1/2): 59–84.

De Castro, F., J. J. Pérez, and M. Rodríguez-Vives. 2013. Fiscal Data Revisions in Europe. *Journal of Money, Credit and Banking* 45 (6): 1187–1209.

Dechow, P., W. Ge, and C. Schrand. 2010. Understanding earnings quality: A review of the proxies, their determinants and their consequences. *Journal of Accounting and Economics* 50 (2): 344–401.

Dechow, P. M., W. Ge, C. R. Larson, and R. G. Sloan. 2011. Predicting Material Accounting Misstatements*: Predicting Material Accounting Misstatements. *Contemporary Accounting Research* 28 (1): 17–82.

Dechow, P. M., A. Lawrence, and J. P. Ryans. 2016. SEC Comment Letters and Insider Sales. *The Accounting Review* 91 (2): 401–439.

Dechow, P. M., R. G. Sloan, and A. P. Sweeney. 1996. Causes and Consequences of Earnings

Preliminary draft – please do not post or disseminate.

Manipulation: An Analysis of Firms Subject to Enforcement Actions by the SEC*. *Contemporary Accounting Research* 13 (1): 1–36.

Desai, H., S. Krishnamurthy, and K. Venkataraman. 2006. Do Short Sellers Target Firms with Poor Earnings Quality? Evidence from Earnings Restatements. *Review of Accounting Studies* 11 (1): 71–90.

European Commission. 2003. *Public finances in EMU. 2003*. European economy 2003,3.

Eurostat. 2021. Quality report on national and regional accounts - 2020 data - 2021 edition: 120.

Ferri, F., and T. Sandino. 2009. The Impact of Shareholder Activism on Financial Reporting and Compensation: The Case of Employee Stock Options Expensing. *The Accounting Review* 84 (2): 433–466.

Fontana, A. and Scheicher, Martin. 2010. An analysis of euro area Sovereign CDS and their relation with government bonds. European Central Bank Working Paper Series.

Graham, J. R., S. Li, and J. Qiu. 2008. Corporate misreporting and bank loan contracting. *Journal of Financial Economics* 89 (1): 44–61.

Griffin, J. M., and D. Y. Tang. 2011. Did Credit Rating Agencies Make Unbiased Assumptions on CDOs? *American Economic Review* 101 (3): 125–130.

von Hagen, J., and G. B. Wolff. 2006. What do deficits tell us about debt? Empirical evidence on creative accounting with fiscal rules in the EU. *Journal of Banking & Finance* 30 (12): 3259–3279.

International Monetary Fund. 2021. Fiscal Monitor. *IMF*. https://www.imf.org/en/Publications/FM/Issues/2021/10/13/fiscal-monitor-october-2021.

Jorge, S. M., M. A. Jesus, and R. M. S. Laureano. 2016. Governmental Accounting Maturity Toward IPSASs and the Approximation to National Accounts in the European Union. *International Journal of Public Administration* 39 (12): 976–988.

Kiff, M. J., S. Nowak, and M. Schumacher. 2012. *Are Rating Agencies Powerful? An Investigation Into the Impact and Accuracy of Sovereign Ratings*. International Monetary Fund.

Klusak, P., M. Kraemer, and H. Vu. 2022. First-mover disadvantage: the sovereign ratings mousetrap. *Financial Markets, Institutions & Instruments* 31 (1): 3–44.

Koen, V., and P. van den Noord. 2005. *Fiscal Gimmickry in Europe: One-Off Measures and Creative Accounting*. Paris: OECD.

Kraft, P. 2015. Do rating agencies cater? Evidence from rating-based contracts. *Journal of Accounting and Economics* 59 (2): 264–283.

Krueger, A. 2002. A New Approach to Sovereign Debt Restructuring. In , 52. International Monetary Fund.

Lehavy, R., F. Li, and K. Merkley. 2011. The Effect of Annual Report Readability on Analyst Following and the Properties of Their Earnings Forecasts. *The Accounting Review* 86 (3): 1087–1115.

Milesi-Ferretti, G. M. 2004. Good, bad or ugly? On the effects of fiscal rules with creative accounting. *Journal of Public Economics* 88 (1): 377–394.

Mody, A., and D. K. Patro. 1996. Valuing and Accounting for Loan Guarantees. *The World Bank Research Observer* 11 (1): 119–142.

Preliminary draft – please do not post or disseminate.

Naughton, J. P., R. Rogo, J. Sunder, and R. Zhang. 2018. SEC monitoring of foreign firms'
   disclosures in the presence of foreign regulators. *Review of Accounting Studies* 23 (4): 1355–
   1388.

Seiferling, M. 2013. IMF Working Papers Volume 2013 Issue 063: Stock-Flow Adjustments,
   Government's Integrated Balance Sheet and Fiscal Transparency (2013). *imfsg*.
   https://www.elibrary.imf.org/view/journals/001/2013/063/001.2013.issue-063-en.xml.

Shleifer, A. 2003. *Will the Sovereign Debt Market Survive?* SSRN Scholarly Paper. Rochester, NY:
   Social Science Research Network.

Slapnik, U., and I. Lončarski. 2021. On the information content of sovereign credit rating reports:
   Improving the predictability of rating transitions☆. *Journal of International Financial
   Markets, Institutions and Money* 73: 101344.

Tomz, M., and M. L. J. Wright. 2013. Empirical Research on Sovereign Debt and Default. *Annual
   Review of Economics* 5 (1): 247–272.

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Appendix A: Variable Definitions

Variable Name	Definition
Reservation variables	
Reservation	Indicator variable that equals one if a reservation or amendment is issued by Eurostat in the time period 2004-2018 and it is a negative news. Reservations are signaled <u>on</u> reported data whereas amendment are made <u>to</u> reported data. Source: Eurostat.
Reservation Expressed	Indicator variable that equals one if a reservation or amendment is expressed by Eurostat, and zero otherwise. Source: Eurostat.
Reservation Maintained	Indicator variable that equals one if a reservation or amendment is maintained by Eurostat, and zero otherwise. Source: Eurostat.
Reservation Withdrawn	Indicator variable that equals one if a reservation or amendment is withdrawn by Eurostat, and zero otherwise. Source: Eurostat.
Determinants Analysis	
Stock-flow adjustments (SFA)	Value of the stock-flow adjustments in percentage of gross domestic product for each European Union country the year before a reservation or amendment was issued or not issued. Years available: 2005 to 2017. Source: Eurostat.
Guarantees	Value of government guarantees in percentage of gross domestic product. Source: Eurostat.
Public debt	Value of the general government consolidated gross debt in percentage of gross domestic product the year before a reservation or amendment was issued or not issued.
Public deficit(-)/surplus(+)	Value of the public deficit/surplus the year before a reservation or amendment was issued or not issued. Public deficit/surplus is defined in the Maastricht Treaty as general government net borrowing/lending according to the European System of Accounts. Source: Eurostat.
GDP growth	Annual GDP growth from the World Economic Outlook (WEO) database. Source: International Monetary Fund (IMF).
Rating	Numerical value of the average of the three credit rating agencies' issuers ratings one year before a reservation or amendment was issued on not issued. Source: Moody's, S&P and Fitch.
Transparency of policymaking	Proxy for the transparency of government policymaking ranging from 1 = extremely low to 7 = extremely high. Source: Executive Opinion Survey for the Global Competitiveness Index from the World Economic Forum.
Public trust	Proxy for public trust ranging from 1 = extremely low to 7 = extremely high. Source: Executive Opinion Survey for the Global Competitiveness Index from the World Economic Forum.
Irregular payments and bribes Efficiency of gov spending	Proxy for the existence of irregular payments and bribes the efficiency of government ranging from 1 = very common to 7 = never occurs. Source: Executive Opinion

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	Survey for the Global Competitiveness Index from the World Economic Forum.
Diversion of public funds	Proxy for the efficiency of government spending ranging from 1 = extremely inefficient to 7 = extremely efficient. Source: Executive Opinion Survey for the Global Competitiveness Index from the World Economic Forum.
	Proxy for the occurrence of the diversion of public funds ranging from 1 = very commonly occurs; 7 = never occurs. Source: Executive Opinion Survey for the Global
Rating Analysis	Competitiveness Index from the World Economic Forum.

Rating Downgrade	
	Indicator variable that equals one where there is a rating downgrade between the date of the reservation at (t) and 30 days before the next reservation at (t+1) by at least one of the three main credit rating agencies (Moody's, S&P and Fitch), and zero otherwise).
Change in Public debt	Change in the value of public debt in the year preceding the reservation. Source: Eurostat.
Change in Public deficit (-)/surplus (+)	Change in the value of the public deficit (-)/surplus (+) in the year preceding the reservation. Source: Eurostat.

Market Impact Analysis	
CAR[A; B]	Cumulative abnormal return are calculated using yields and with an estimation window of [-60, -30] and an event window is [A; B]. The sample period is from 2004-2018. Source: Reuters.

Appendix B: Figures

Figure 1: Country distribution

Notes. This figure displays Eurostat reservations to European countries' data on a map.

Figure 2: Timeline distribution

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Figure 3: Cumulative Abnormal Return on a [-1,15] window

Notes. This figure plots the cumulative abnormal returns on the issuance of Eurostat reservations for the window [-1,15]. We use the 67 reservations in our sample and compare the cumulative market reaction on the issuance of Eurostat reservations to the cumulative market reaction in absence of a reservation announcement.

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Appendix C. Reservation List[20]

Panel A: Details provided by Eurostat

	Country and Reservation Date	Details provided by Eurostat followed by small digest in italic prepared by authors
1	Austria 21 Oct. 2013	Eurostat is expressing a reservation on the quality of the data reported by Austria, due to uncertainties on the statistical impact of the conclusions of the Federal Audit Office's report on the Land Salzburg, published on 9 October 2013. The report revealed deficiencies with regard to financial management and to completeness of the public accounts of the Land Salzburg. The statistical implications of the audit for EDP data are being investigated by Statistics Austria in collaboration with Eurostat, in order to clarify the precise impacts on 2012 and also on preceding years. It is possible that this will lead to an upward revision of government debt of up to half a percent of GDP, with more minor revisions to the government deficit, based on the information available at this point. *Problem identified: Public entity | Impact: Income Statement, Balance Sheet*
2	Austria 21 Oct. 2015	Eurostat is expressing a reservation in relation to an insufficient adherence to the accrual rules of recording of expenditure and revenue, as required in ESA 2010, notably at the budgetary central government level ("Bund"). Currently, a significant number of transactions are recorded on a cash basis in national accounts. This situation creates uncertainty on the quality of the figures and the risk that data will be revised in the April 2016 EDP exercise. Eurostat expects that the National Statistical Institute and the Ministry of Finance will cooperate on moving from substantially cash based reporting to an accrual-based system in national accounts, using the new sources now at their disposal, integrating cash statements with balance sheet and profit and loss accounts information. *Problem identified: Other (Accounting basis) | Impact: Income Statement*
3	Belgium 24 Apr. 2006	Eurostat considers that the assumption by government in 2005 of 7400 million euro of the debt of the railway company SNCB must result, according to ESA95 rules, in a capital transfer from government to SNCB, with an impact on the government deficit by the same amount (equal to 2.5% of GDP). However, the Belgian statistical authorities have informed Eurostat of the intention of the Belgian government to introduce legislation to retroactively annul this operation. The accounting consequences of this must be clarified before the next EDP notification in October 2006. *Problem identified: Public corporation | Impact: Income Statement, Balance Sheet*
4	Belgium 31 Oct. 2006	Eurostat has amended the deficit and debt data notified by Belgium for 2005 in relation to the assumption by government (FIF - Fonds de l'infrastructure ferroviaire) in 2005 of 7 400 million euro (2.5% of GDP) of the debt of the railway company SNCB. According to ESA95 rules, the impact on the government deficit is of the same amount; the impact on the government debt at the end of 2005 amounts to 5 200 million euro (1.7% of GDP). *Problem identified: Public corporation | Impact: Income Statement, Balance Sheet*
5	Belgium 21 Apr. 2016	Eurostat is expressing a reservation in relation to the sector classification of hospitals. Eurostat considers that, in line with ESA 2010, government-controlled hospitals in Belgium should be classified inside government. This is

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		currently not the case. A future reclassification will most likely result in a limited increase in government debt.
		*Problem identified: Public entity	Impact: Balance Sheet*
6	Bulgaria 21 Apr. 2015	Eurostat is expressing a reservation in relation to the sector classification of the Deposit Insurance Fund and the impact on the government deficit of the fund's repayment of the guaranteed deposits (3.7 bn BGN) in the Corporate Commercial Bank. The impact of the transaction will be assessed by Eurostat in cooperation with the Bulgarian statistical authorities during the coming months. This will most likely result in an increase of the government deficit. *Problem identified: Public corporation	Impact: Income Statement*
7	Cyprus 21 Oct. 2016	Eurostat is expressing a reservation in relation to a series of technical issues, such as the recording of EU flows, the basis for the working balance of central government, the incomplete use of source data for accrual reporting and the absence of reporting of statistical discrepancy in EDP tables. *Problem identified: Revenues and/or expenditures	Impact: Income Statement*
8	Denmark 22 Apr. 2009	During 2008 the Danish authorities nationalised the Roskilde Bank and established a vehicle for bank rescues (AFS-Afviklingsselskabet). These bodies have been classified as financial corporations in the reported Danish data. Eurostat is investigating these cases. *Problem identified: Bank capital injection	Impact: Balance Sheet*
9	France 24 Apr. 2006	Eurostat has amended the deficit data notified by France for the year 2005, due to a reclassification as a capital transfer of a capital injection in the railway company SNCF, by an amount of 250 million euro (0.01% of GDP). There is no change in the reported debt figures. *Problem identified: Public corporation	Impact: Income Statement*
10	France 21 Apr. 2016	Eurostat is expressing a reservation in relation to two issues. First, the sector classification of the French Deposit Guarantee and Resolution Funds (Fonds de garantie des Dépôts et de Résolution - FGDR) in 2015 which will most likely result in a limited increase in government debt and a limited decrease in government deficit. Second, the recording of settlement costs related to the restructuring of complex debt instruments undertaken by local government which will most likely result in a limited increase in government deficit for the year 2015. *Problem identified: Public corporation, public entity	Impact: Income Statement, Balance Sheet*
11	France 23 Oct. 2017	Eurostat is expressing a reservation on the quality of the data reported by France in relation to the recording of some operations of the Agence Française de Développement. Eurostat will investigate these issues with the French statistical authorities. *Problem identified: Public corporation	Impact: Balance Sheet*
12	France 23 Apr. 2018	Eurostat is expressing a reservation. Firstly, in relation to the sector classification of the Agence Française de Développement, which Eurostat considers should be classified inside the general government sector. A future reclassification will result in an increase in government debt. Moreover, Eurostat considers that the capital injection by the State into AREVA (NewCo/Orano) for an amount of €2.5 bn (0.1% of GDP) in 2017 should be treated as a capital transfer, with an impact on the deficit. *Problem identified: Public corporation	Impact: Income Statement, Balance Sheet*
13	Greece 23 Sept. 2004	The revision of data for the deficit between the March and September 2004 notifications was carried out on the basis of new information provided by the Greek Authorities, at the request of Eurostat, for the period 2000-2003. The change in the deficit figure is due mainly to: - Downward revision for 2003 of estimate of tax revenues (mainly VAT) in public accounts; - Downward revision for 2003 of payments received from EU institutions in the context of certain structural fund

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		programmes;
		- Reclassification for 2003 of a payment from the postal savings bank to government as a financial transaction;
		(for these first three items see News Release 62/2004 of 7 May 2004)
		- Under-recording of military expenditures between 2000 and 2003;
		- Over-estimation of surplus of social security funds between 2001 and 2003;
		- Under-recording of interest between 2000 and 2003.
		The revision of data for the debt between the March and September 2004 notifications was carried out on the basis of new information provided by the Greek Authorities for the period 2000-2003. The change in the debt figure is due mainly to:
		- Under-estimation of outstanding debt, notably in relation to bonds with capitalised interest;
		- Over-estimation of consolidating assets of social security.
		*Problem identified: Revenues and/or expenditures, public corporation	Impact: Income Statement, Balance Sheet*
14	Greece 18 Mar. 2005	Eurostat is not in a position to validate the figures for Greece. This is mainly due to a newly communicated inconsistency in the recording of flows between Greece and the EU budget. In addition, data for government deficit for the years 2002 and 2003 have also been revised by the Greek authorities in their March 2005 notification. These revisions were mainly due to the fact that a new law concerning the repayment of debt of hospitals was adopted at the end of 2004 by the Greek government. This revealed that unpaid expenditure by hospitals for the past years had not been properly booked when expenditure was incurred. Moreover, data on expenditure arrears of hospitals and on government expenditure for the Olympic Games are not yet final. This could lead to a further upward revision in the deficit figures. *Problem identified: Public entity	Impact: Income Statement*
15	Greece 23 Oct. 2006	Eurostat is using for the purpose of this EDP notification the GDP figures notified in April 2006, and not the revised GDP data reported by the Greek authorities on 1 October 2006. Given the magnitude and complexity of the revised GDP data (an increase of 25% compared to the old figures), Eurostat will carry out a complete verification of GDP data once Greece has delivered a full inventory of the sources and methods used for the new calculations. *Problem identified: Public entity, Other (GDP), Revenues and/or expenditures	Impact: Income Statement, Balance Sheet*
16	Greece 18 Apr. 2008	Eurostat is in the process of clarifying, in close co-operation with the Greek statistical authorities, some issues relating to the recording of EU grants in 2006 and 2007, the existence of a substantial statistical discrepancy in 2007 of 0.6% of GDP and the insufficient coverage of source data for extra-budgetary funds, local government and social security funds achieved for the first estimate of the 2007 balance. *Problem identified: Public entity	Impact: Income Statement, Balance Sheet*
17	Greece 22 Oct. 2009	Eurostat has expressed a reservation on the data reported by Greece due to significant uncertainties over the figures notified by the Greek statistical authorities. *Problem identified: Other (Not disclosed)	Impact: Other (Not disclosed)*
18	Greece 22 Apr. 2010	Eurostat is expressing a reservation on the quality of the data reported by Greece, due to uncertainties on the surplus of social security funds for 2009, on the classification of some public entities and on the recording of off-market swaps. Following completion of the investigations that Eurostat is undertaking on these issues in cooperation with the Greek Statistical Authorities, this could lead to a revision for the year 2009 of the order of 0.3 to 0.5 percentage points of GDP for the deficit and 5 to 7 percentage points of GDP for the debt.

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		*Problem identified: Public entity	Impact: Income Statement, Balance Sheet*
19	Hungary 21 Apr. 2016	Eurostat is expressing a reservation in relation to the sector classification of Eximbank (Hungarian Export-Import Bank Plc). Eximbank needs to be reclassified inside the general government sector which will result in an increase in government debt. *Problem identified: Bank capital injections	Impact: Balance Sheet*
20	Hungary 23 Apr. 2018	Eurostat is expressing a reservation on the quality of the data reported by Hungary in relation to the sector classification of the foundations created by the Hungarian National Bank. Eurostat considers that these foundations, including their subsidiaries, should be classified inside general government. *Problem identified: Bank capital injections	Impact: Balance Sheet*
21	Ireland 23 Apr. 2012	Eurostat is expressing a specific reservation on the data reported by Ireland, due to the fact that the restructuring plans of Allied Irish Banks and Irish Life & Permanent are not yet finalised. These restructuring plans have been used by the Irish statistical authorities to calculate in the reported figures a (deficit increasing) capital transfer element of 3.7% GDP arising from the July 2011 government injections into the two banks. Eurostat awaits the finalisation of the restructuring plans, including approval by the EU competition authorities, so that the amount of the capital transfer element can be confirmed. Eurostat is also expressing a specific reservation on the data reported by Ireland, due to the statistical classification of National Asset Management Agency Investment Limited (NAMA-IL), which is currently classified outside the general government. Owing to the nationalisation of one of its previously private beneficial owners, whose interest is currently under a process of sale, NAMA-IL has been in majority public ownership since July 2011. Eurostat's decision of 15 July 2009 on public interventions during the financial crisis specifies that majority private ownership is necessary for such an entity to be classified outside the General Government sector. *Problem identified: Bank capital injection	Impact: Balance Sheet*
22	Italy 18 Mar. 2005	Eurostat is not in a position to validate the figures for Italy. This is mainly due to the recording of payments to government by financial institutions which act as tax collectors on behalf of the government (concessionari d'imposta), the sectoral classification of government-owned entities (ISPA), the treatment of a securitisation operation, the recording of transactions with the EU budget, inconsistencies between data on cash and accrual bases and statistical discrepancies in government accounts. The clarification of these issues could lead to an upward revision in the government deficit, most notably for 2003 and 2004. *Problem identified: Public corporation, Bank capital injection, Other (Accounting basis)	Impact: Income Statement*
23	Luxembourg 24 Apr. 2017	Eurostat is expressing a reservation on the quality of the data reported by Luxembourg in relation to the sector classification of hospitals, as well as a number of technical issues such as the recording of receivables and payables, the size of statistical discrepancies in the EDP tables and the unavailability of data for local government. Eurostat will investigate these issues with the Luxembourgish statistical authorities. *Problem identified: Public entity	Impact: Balance Sheet*
24	Netherlands 23 Apr. 2014	Eurostat is expressing a reservation due to uncertainties on the statistical impact of the government interventions relating to the nationalisation and restructuring of SNS Reaal in 2013. The size of the impact is being clarified with the Dutch statistical authorities. Based on currently available information, Eurostat expects that the resulting

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		increase in the government deficit for 2013 would not exceed 0.3% of GDP.
		*Problem identified: Bank capital injection	Impact: Income Statement*
25	Portugal 18 Mar. 2005	There are ongoing discussions between Eurostat and Portugal on the consistency between accrual and cash-based data provided by Portugal, for the period 2001-2004. States which may lead to a subsequent revision of the data. *Problem identified: Other (Accounting basis)	Impact: Other (Not disclosed)*
26	Portugal 26 Sept. 2005	The Portuguese statistical authorities have informed Eurostat that they will investigate the nature of a dividend paid by a public corporation, Empresa de Desenvolvimento Mineiro (EDM), treated as government revenue and recorded in 2004. This might increase the deficit of general government by about 0.03% of GDP. *Problem identified: Public corporation	Impact: Income Statement*
27	Portugal 23 Apr. 2007	Eurostat has amended upwards the deficit data notified by Portugal in 2005 by 158 mn euro (0.1% of GDP) due to the reclassification of capital injections as capital transfers by government in two hospitals (Santa Maria and Nordeste). According to ESA95 rules, capital injections in public enterprises add to the deficit when government does not act as a private shareholder and there are doubts on the profitability of the project. *Problem identified: Public entity	Impact: Income Statement*
28	Portugal 21 Apr. 2015	Eurostat is expressing a reservation in relation to the capitalisation of Novo Banco. In the third quarter of 2014, the Portuguese Resolution Fund injected 4.9 bn euro (2.8% of GDP) into Novo Banco. In this EDP notification, the transaction has provisionally been recorded by the Portuguese authorities as a financial transaction for its full amount (due to lack of information) without any impact on the government deficit. The final impact of the transaction will be assessed by Eurostat in cooperation with the Portuguese statistical authorities during the coming months following the outcome of the privatisation process of Novo Banco and the final amount which the Portuguese government will obtain from the sale. This will most likely result in an increase of the government deficit. *Problem identified: Bank capital injection	Impact: Income Statement*
29	Romania 26 Apr. 2011	Eurostat is expressing a reservation on the quality of the data reported by Romania, due to uncertainties on the impact of some public corporations on the government deficit, on the reporting of ESA95 categories "other accounts receivable and payable", on the nature and impact of some financial transactions and on the consolidation of intra-governmental flows. *Problem identified: Public corporation	Impact: Balance Sheet*
30	United Kingdom 24 Apr. 2006	Eurostat has amended the data notified by the United Kingdom for years 2002 to 2005 for consistency of recording of UMTS licence proceeds. This leads to an increase in the government deficits for 2002, 2004 and 2005 (as well as for financial years 2002/03, 2004/05 and 2005/06) by GBP 1 045 million (0.1% of GDP) and for 2003 (financial year 2003/04) by GBP 1 044 million (0.1% of GDP). There is no change in the reported debt figures. *Problem identified: Revenues and/or expenditures| Impact: Income Statement*
31	United Kingdom 22 Oct. 2008	In 2007 the Bank of England made a loan of GBP 26.93 bn (1.9% of GDP) to Northern Rock Bank in the context of a rescue operation. Eurostat has taken the provisional view that the Bank of England lending to Northern Rock should have government as the principal party of the transaction in the national account framework. If the loan were to be treated in this way, the debt to GDP ratio would be 46.1% at end 2007 and 44.9% at end 2007/2008. The issue will be the object of further discussion with the Office for National Statistics (ONS). The lending to Northern Rock Bank has no direct impact on the UK government deficit for 2007. *Problem identified: Bank capital injection	Impact: Balance Sheet*

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32	United Kingdom 22 Apr. 2009	From April 2008 the United Kingdom government provided 185 billion GBP of treasury bills to the Bank of England for use in the Special Liquidity Scheme. These bills are not currently recorded as part of United Kingdom government debt. Eurostat is considering the appropriate treatment of these bills, and whether or not they should be statistically included as part of United Kingdom government debt. *Problem identified: Public entity | Impact: Balance Sheet*
33	United Kingdom 26 Apr. 2011	Eurostat is expressing a reservation on the quality of the data reported by the United Kingdom, due to uncertainties on the time of recording of military expenditure. The United Kingdom does not record military expenditure on a delivery basis, as required by the relevant Eurostat Decision of 9 March 2006. Eurostat has also amended the deficit and debt data notified by the United Kingdom for the years 2008 to 2010 (as well as for financial years 2008/2009 to 2010/2011), to ensure compliance with the Eurostat guidance note of 16 March 2011 on financial defeasance structures, with respect to Bradford & Bingley (B&B) and Northern Rock Asset Management (NRAM). This leads to an increase in government deficit by 360 mn GBP (0.03% of GDP) in 2008 (as well as in financial year 2008/2009), by 571 mn GBP (0.04% of GDP) in 2009 (as well as in financial year 2009/2010) and by 1 023 mn GBP (0.07% of GDP) in 2010 (as well as in financial year 2010/2011). The reported debt figures are increased by 32 374 mn GBP (2.24% of GDP) in 2008 (as well as in financial year 2008/2009), by 19 969 mn GBP (1.43% of GDP) in 2009 (as well as in financial year 2009/2010) and by 56 821 mn GBP (3.89% of GDP) in 2010 (as well as in financial year 2010/2011). *Problem identified: Bank capital injection, Revenues and/or expenditures, Public entity | Impact: Income Statement, Balance Sheet*

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Panel B: Statistics

Figure B1: Source of the problem identified in the reservations
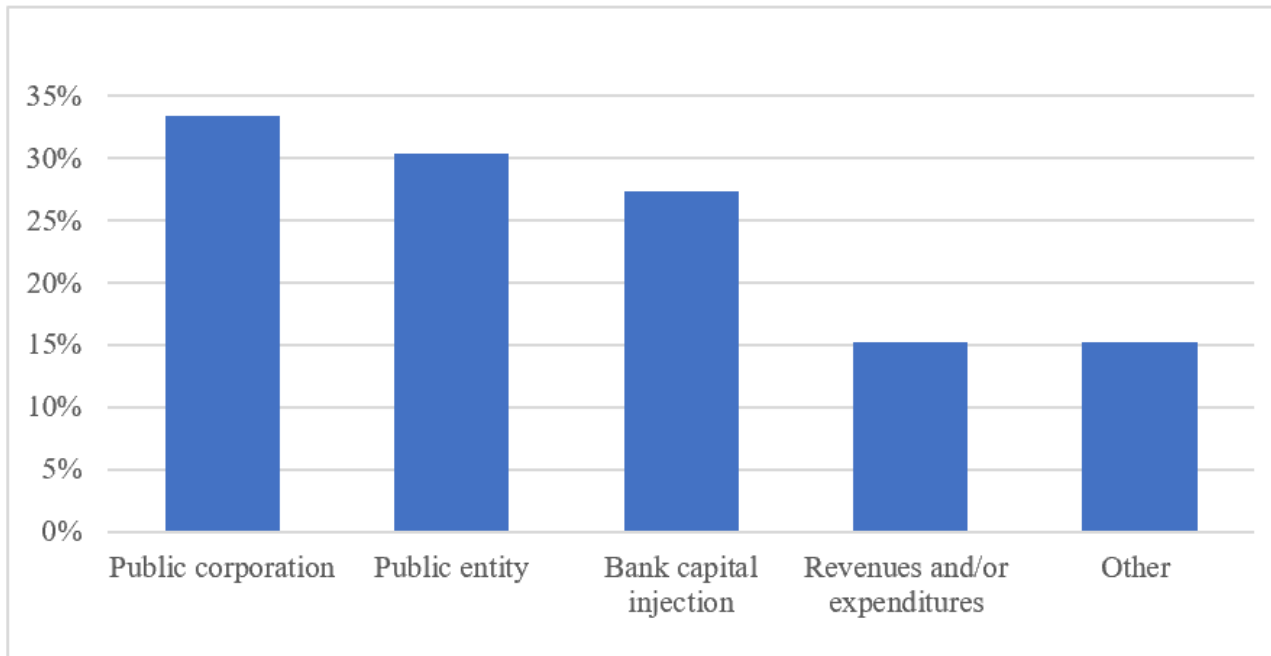
Figure B1: Impact on the financial statement on the reservations

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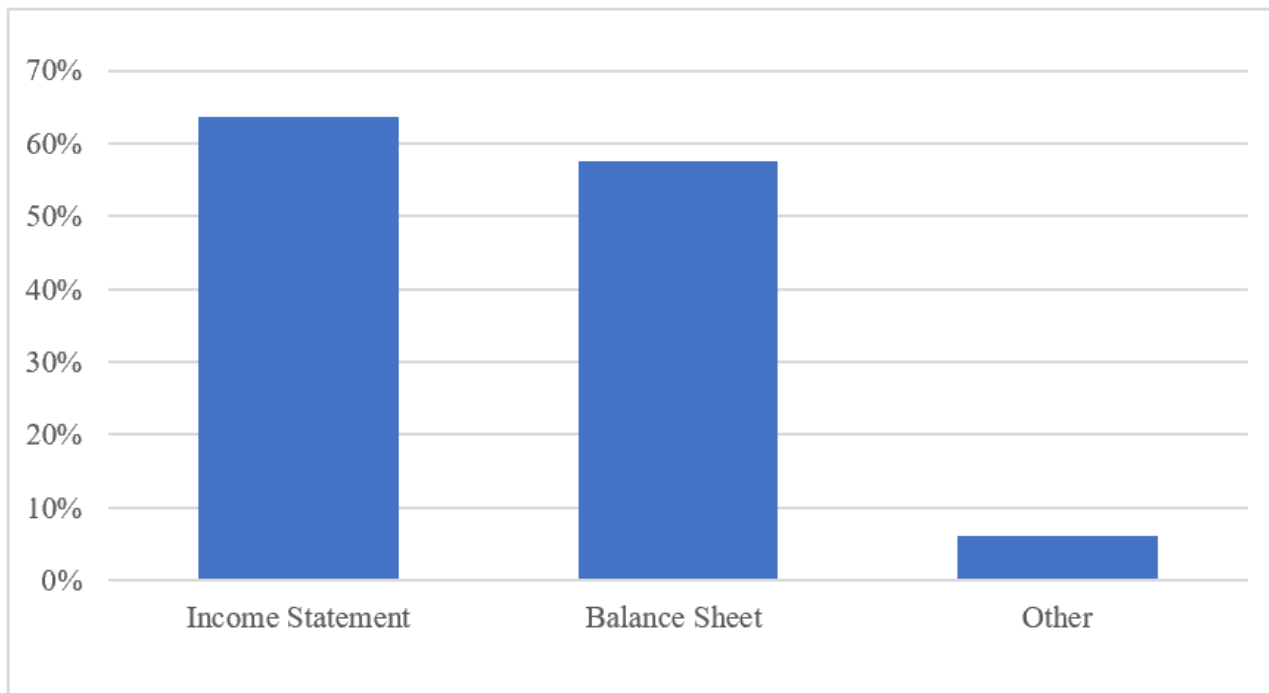
Table 1. Sample Selection and Summary Statistics

Panel A: Sample Selection

Steps	Sample Selection	Number of observations
1	Find all notifications of reservations and amendments issued by Eurostat between 2004-2018	91
2	Drop events conveying a positive news	6
3	Drop Germany	1
4	Drop duplicates (two events on same day for same country)	12
5	Drop events of countries with no yields available at all (Latvia)	2
6	Drop events with no yield on the event day (3)	3
	Final number of events used in the regressions	*67*

Notes. This table presents the sample selection procedure.

Panel B: Country Distribution

Country	No. of Observations	% of Sample
Austria	4	6
Belgium	9	13
Bulgaria	1	2
Cyprus	2	3
Denmark	2	3
France	5	8
Greece	11	16
Hungary	4	6
Ireland	1	2
Italy	1	2
Luxembourg	2	3
Netherlands	2	3
Portugal	6	9
Romania	2	3
United Kingdom	15	22
Total	67	100

Notes. This table summarizes the country distribution of the reservations sample from 2004 to 2018.

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Panel C: Year Distribution

Year	No. of Observations	% of Sample
2004	1	2
2005	5	8
2006	7	10
2007	8	12
2008	4	6
2009	5	8
2010	4	6
2011	4	6
2012	3	5
2013	1	2
2014	3	5
2015	4	6
2016	8	12
2017	7	10
2018	3	5
Total	67	100

Notes. This table summarizes the year distribution of the reservations sample from 2004 to 2018.

Panel D: Reservations for sub-samples

	Number of observations	% of Sample
Reservation	*67*	*100*
Event Type		
Reservation Expressed	33	49.3
Reservation Maintained	20	29.9
Reservation Withdrawn	14	20.9
Total	*67*	*100*
Event Relevance		
Deficit or debt	41	61.3
Not disclosed	26	38.8
Total	*67*	*100*
Event Precision		
Quantified	32	47.8
Non-quantified	35	52.2
Total	*67*	*100*

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<u>Initially Reported Data</u>

Initial estimate	41	61.2
Not disclosed	26	38.8
Total	*67*	*100*

<u>Time Period</u>

Before start of crisis [2004-Sep2009]	27	40.3
After start of crisis [Oct2009-2018]	40	59.7
Total	*67*	*100*

<u>Country Type</u>

GIIPS	19	28.4
Non- GIIPS	48	71.6
Total	*67*	*100*

Notes. This table summarizes the distribution of the reservations sample across our sub-samples: event type (either expressed, maintained or withdrawn reservations), event relevance (either impact on deficit or debt or not disclosed), event precision (quantified effect of the reservation or unquantified one), event year (initial estimate or not disclosed), time period (2004-Sep2009, Oct2009-2018) and finally by country type (GIIPS or non GIIPS) GIIPS refer to Greece, Ireland, Italy, and Portugal, Spain.

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Table 2. Descriptive Statistics for Reservations Determinants Tests

	Mean	P50	Min	Max	SD	N
Reservation	0.09	0	0	1	0.28	811
Stock-flow adjustments	0.54	0.43	-35	15.49	3.27	811
Guarantees	11.25	7.38	0.02	96	15.62	811
Public debt	59.66	54.2	3.8	180.8	34.67	811
Public deficit (-)/surplus (+)	-2.68	-2.5	-32.1	5.1	3.66	811
GDP growth	2.27	2.4	-14.84	25.18	3.78	811
Transparency of government policymaking	4.51	4.53	2.54	6.13	0.84	561
Public trust	3.47	3.3	1.54	6.21	1.27	561
Irregular payments and bribes	5.16	5.16	3.35	6.76	0.92	411
Efficiency of government spending	3.41	3.41	1.78	5.4	0.86	561
Diversion of public funds	4.5	4.54	2.46	6.59	1.23	561
Rating	19.9	20.33	4.33	24	3.96	811

Notes. This table reports the summary statistics of variables used in the determinants test for reservations reported in Table 3. Variable definitions are provided in Appendix A.

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Table 3. Reservations Determinants

Panel A: Determinants across countries

VARIABLES	Reservation (t)											
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Stock-flow adjustments (t-1)	0.00686*											0.0114***
	(1.88)											(3.13)
Guarantees (t-1)		0.000164										
		(0.13)										
Public debt (t-1)			0.00159***									0.000876
			(3.49)									(1.49)
Public deficit (-)/surplus (+) (t-1)				-0.0186**								-0.0161
				(-2.18)								(-1.67)
GDP growth (t-1)					-0.0126**							-0.00431
					(-2.68)							(-0.74)
Log Transparency of gov policymaking (t-1)						-0.0475						
						(-0.49)						
Log Public trust (t-1)							0.00653					
							(0.16)					
Log Irregular payments and bribes (t-1)								0.0743				
								(0.77)				

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	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Log Efficiency of government spending (t-1)										-0.0132		
										(-0.26)		
Log Diversion of public funds (t-1)											0.0267	
											(0.37)	
Rating (t-1)												0.00366
												(0.74)
Constant	0.0381	0.0377	-0.0393	-0.0156	0.0782*	0.151	0.0721	-0.0421	0.0971	0.0384	-0.0387	-0.0421*
	(0.93)	(1.07)	(-1.11)	(-0.53)	(2.02)	(1.00)	(0.95)	(-0.26)	(1.04)	(0.34)	(-0.30)	(-1.70)
Observations	811	811	811	811	811	561	561	411	561	561	811	811
R-squared	0.026	0.021	0.054	0.063	0.036	0.020	0.019	0.028	0.019	0.020	0.023	0.091
Country FE	No	No	No	No	No	No	No	No	No	No	No	No
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

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Panel B: Determinants within countries

VARIABLES	Reservation (t)										
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Stock-flow adjustment (t-1)	0.0122*** (3.54)										
Guarantees (t-1)		0.000151 (0.17)									
Public debt (t-1)			-0.00378 (-1.29)								
Public deficit (-)/surplus (+) (t-1)				-0.00958 (-1.62)							
GDP growth (t-1)					-0.00233 (-0.30)						
Log Transparency of gov policymaking (t-1)						-0.510 (-1.02)					
Log Public trust (t-1)							-0.137 (-0.48)				
Log Irregular payments and bribes (t-1)								0.148 (0.20)			
Log Efficiency of government spending (t-1)									0.0123 (0.04)		

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	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Log Diversion of public funds (t-1)											-0.203
											(-0.66)
Rating (t-1)											0.0219
											(1.18)
Constant	0.0817**	0.0789*	0.327	0.0574	0.0896***	1.001	0.366	-0.0158	0.157	0.522	-0.460
	(2.29)	(1.80)	(1.60)	(1.63)	(3.56)	(1.23)	(0.92)	(-0.01)	(0.34)	(1.00)	(-1.05)
Observations	811	811	811	811	811	561	561	411	561	561	811
R-squared	0.240	0.223	0.244	0.229	0.224	0.184	0.173	0.174	0.171	0.173	0.242
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes. This table reports the coefficient estimates and t-statistics from ordinary least squares (OLS) regressions of *Reservation* on national accounting characteristics. The sample period is from 2004-2018. Variable definitions are provided in Appendix A. t-statistics based on standard errors clustered at country level are displayed in parentheses below the coefficient estimates. Panel A does not include country fixed effects whereas Panel B does. ***, **, * indicate significance at the 1%, 5%, and 10% levels, respectively.

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Table 4. Ratings Impact Tests

Panel A: Descriptive Statistics

	Mean	P50	Min	Max	SD	N
Austria	23.71	24.00	23	24	0.37	28
Belgium	22.31	22.67	21	23	0.70	28
Bulgaria	15.46	15.33	15	16	0.36	23
Croatia	13.26	13.33	13	14	0.28	9
Cyprus	15.54	18.00	8	21	4.92	28
Czechia	19.83	20.00	19	20	0.57	28
Denmark	24.00	24.00	24	24	0.00	28
Estonia	19.73	19.83	18	20	0.67	28
Finland	23.80	24.00	23	24	0.37	28
France	23.33	24.00	22	24	0.85	28
Germany	24.00	24.00	24	24	0.00	28
Greece	12.61	11.00	4	19	6.00	28
Hungary	15.73	15.00	14	19	1.76	28
Ireland	20.26	19.50	16	24	3.27	28
Italy	18.82	20.17	16	22	2.47	28
Latvia	16.83	17.67	14	18	1.62	28
Lithuania	17.61	18.00	16	19	0.96	28
Luxembourg	24.00	24.00	24	24	0.00	28
Malta	18.81	18.67	18	20	0.63	28
Netherlands	23.95	24.00	24	24	0.12	28
Poland	18.18	18.33	18	18	0.25	28
Portugal	17.37	15.33	13	22	3.92	28
Romania	14.83	15.00	14	15	0.35	23
Slovakia	19.48	19.33	18	20	0.43	28
Slovenia	19.67	21.00	16	22	2.37	28
Spain	20.24	21.50	15	24	3.70	28
Sweden	24.00	24.00	24	24	0.00	28
United Kingdom	23.57	24.00	22	24	0.65	28
Average	19.90	20.33	4	24	4.00	755

Notes. This table reports the summary statistics for average ratings across the three ratings agencies by country. Variable definitions are provided in Appendix A.

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Panel B: Ratings Impact Test

VARIABLES	Rating Downgrade (t+1)			
	(1)	(2)	(3)	(4)
Reservation (t)	-0.102	-0.223		
	(-0.17)	(-0.32)		
Reservation expressed (t)			-0.639	-0.720
			(-0.91)	(-0.90)
Reservation maintained (t)			-1.160	-1.333
			(-0.61)	(-0.67)
Reservation withdrawn (t)			0.771	0.741
			(1.17)	(1.25)
Change in Public debt (t)		0.170**		0.170**
		(2.21)		(2.19)
Change in Public deficit(-)/surplus(+) (t)		-0.0717*		-0.0735*
		(-1.88)		(-1.92)
GDP growth (t)		-0.0433		-0.0421
		(-0.43)		(-0.42)
Stock-flow adjustments (t)		-0.0966		-0.0937
		(-1.29)		(-1.24)
Constant	-3.350***	-2.783***	-3.269***	-2.770***
	(-4.42)	(-4.41)	(-4.57)	(-4.58)
Observations	592	592	592	592
Country FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes

Notes. This table reports the results from the logistic regressions of rating downgrade (variable that equals one where there is a rating downgrade between the date of the reservation at (t) and 30 days before the next reservation at (t+1) by at least one of the three main credit rating agencies (Moody's, S&P and Fitch), and zero otherwise), along with a set of control variables. T-statistics are based on standard errors clustered at country level are displayed in parentheses below the coefficient estimates. Variable definitions are provided in Appendix A. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively, using two-tailed tests.

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Table 5. Descriptive Statistics for Market Reaction Tests

Panel A: Daily Yields by Country (in bps)

	Mean	P50	Min	Max	SD	N
Austria	2.52	3.01	0.18	4.43	1.45	54
Belgium	2.84	3.55	0.23	4.48	1.48	58
Bulgaria	4.21	4.45	1.23	7.40	1.83	44
Croatia	3.57	3.41	2.23	5.25	0.95	20
Cyprus	3.58	3.35	3.23	4.15	0.45	6
Czechia	2.79	3.22	0.37	5.58	1.55	52
Denmark	2.41	2.29	0.14	4.38	1.50	54
Finland	2.54	2.86	0.14	4.37	1.47	58
France	2.69	3.14	0.28	4.37	1.39	58
Germany	2.37	2.84	0.00	4.29	1.49	62
Greece	8.40	6.31	3.34	24.80	5.47	56
Hungary	6.24	6.68	2.59	10.89	2.36	48
Ireland	3.91	4.10	0.46	10.71	2.60	52
Italy	3.65	4.11	1.44	5.95	1.28	58
Lithuania	4.22	4.18	0.40	14.22	3.08	56
Luxembourg	1.43	1.44	0.77	2.32	0.49	18
Malta	2.41	2.14	0.50	4.23	1.30	30
Netherlands	2.55	2.81	0.11	4.37	1.47	58
Poland	4.73	5.00	2.38	7.00	1.42	58
Portugal	4.86	4.06	1.68	12.61	2.62	58
Romania	6.25	6.11	3.02	11.00	2.42	44
Slovakia	2.70	2.69	0.39	5.20	1.86	34
Slovenia	3.64	4.42	0.62	6.34	1.97	42
Spain	3.57	3.97	1.11	6.02	1.40	58
Sweden	2.48	2.89	0.16	4.32	1.36	58
United Kingdom	3.14	3.29	1.05	5.08	1.38	58
Total	3.66	3.68	0.00	24.80	2.57	1252

Notes. This table reports the summary statistics for yields by country used in the market reaction test reported in Table 6 and 7.

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Panel B: Daily Yields by Year

	Mean	P50	Min	Max	SD	N
2004	4.62	4.12	3.86	8.55	1.23	34
2005	3.81	3.70	3.01	7.10	0.93	66
2006	4.17	3.97	3.81	6.99	0.57	68
2007	4.62	4.39	3.92	7.17	0.67	119
2008	5.17	4.58	3.50	11.00	1.67	85
2009	5.22	4.05	3.14	14.22	2.60	87
2010	4.65	3.99	2.57	11.71	1.92	90
2011	5.83	4.65	1.94	24.80	4.33	76
2012	4.76	4.00	1.57	21.48	3.93	86
2013	3.59	3.18	1.23	11.44	2.04	92
2014	2.67	2.27	0.87	7.78	1.44	96
2015	1.76	1.15	0.10	13.59	2.14	98
2016	1.62	0.92	0.00	8.79	1.81	105
2017	1.66	1.11	0.34	6.43	1.36	100
2018	1.55	1.23	0.63	4.61	1.02	50
Total	3.66	3.68	0.00	24.80	2.57	1252

Notes. This table reports the summary statistics for yields by year used in the market reaction test reported in Table 6 and 7.

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Table 6. Market Reaction Test

VARIABLES	CAR 0/+1 (1)	CAR -1/+1 (2)	CAR 0/+1 (3)	CAR -1/+1 (4)
Reservation	0.0123**	0.00958**		
	(2.45)	(2.62)		
Reservation Expressed			0.0137***	0.0195***
			(4.14)	(4.95)
Reservation Maintained			0.00532	-0.00394
			(0.70)	(-0.87)
Reservation Withdrawn			0.0168	0.00164
			(1.25)	(0.28)
Stock Flow Adjustment	-0.000157	0.000161	-0.000144	0.000157
	(-0.21)	(0.17)	(-0.20)	(0.16)
Constant	-0.000763	-0.00327***	-0.000719	-0.00318***
	(-1.41)	(-7.76)	(-1.39)	(-7.80)
Observations	595	595	595	595
R-squared	0.024	0.027	0.025	0.030
Country FE	Yes	Yes	Yes	Yes

Notes. This table reports the coefficient estimates and t-statistics from ordinary least squares (OLS) regressions of cumulative abnormal returns (CAR) on *Reservation*. The dependent variable is the cumulative abnormal return (CAR) over the [0/+1], [-1/+1] event windows. The estimation window is [-60/-30] and the sample period is 2004-2018. Variable definitions are provided in Appendix A. t-statistics based on standard errors clustered at country level are displayed in parentheses below the coefficient estimates. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively, using two-tailed tests.

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Table 7. Market Reaction Test for subsamples

Panel A: Market reaction by Reservation Content

VARIABLES	CAR 0/+1					
	Deficit or debt	*Not disclosed*	*Quantified*	*Non-Quantified*	*Initial release*	*Not disclosed*
	(1)	(2)	(3)	(4)	(5)	(6)
Reservation	0.0128***	0.0119	0.0118**	0.0121*	0.00959*	0.0164**
	(2.803)	(1.433)	(2.512)	(1.812)	(1.863)	(2.197)
Stock Flow Adjustment	-0.000141	-0.000210	-0.000185	-0.000176	-0.000136	-0.000221
	(-0.190)	(-0.270)	(-0.248)	(-0.228)	(-0.184)	(-0.284)
Constant	-0.000665*	-0.000421	-0.000444	-0.000579	-0.000575	-0.000601
	(-1.824)	(-1.025)	(-1.383)	(-1.333)	(-1.607)	(-1.401)
Observations	569	554	560	563	567	552
R-squared	0.025	0.023	0.025	0.023	0.024	0.024
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Coef. comp. F-test	Chi2	Prob>Chi2	Chi2	Prob>Chi2	Chi2	Prob>Chi2
	0.011	0.914	0.003	0.954	0.578	0.447

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Panel B: Market reaction by Sovereign Debt Riskiness

VARIABLES	CAR 0/+1			
	2004-Sep2009	Oct2009-2018	*GIIPS*	*Non-GIIPS*
	(1)	(2)	(3)	(4)
Reservation	0.00746**	0.0169*	0.0164*	0.0108
	(2.699)	(2.043)	(2.698)	(1.629)
Stock Flow Adjustment	-5.59e-05	-0.000448	-0.000347	0.000118
	(-0.0540)	(-0.663)	(-0.356)	(0.0969)
Constant	0.00535***	-0.00390***	-0.00166	-0.000709
	(4.335)	(-4.813)	(-1.598)	(-0.794)
Observations	195	400	112	483
R-squared	0.207	0.027	0.052	0.023
Country FE	Yes	Yes	Yes	Yes
Coef. comp. F-test	Chi2	Prob>Chi2	Chi2	Prob>Chi2
	0.745	0.387	0.372	0.541

Notes. This table reports the coefficient estimates and t-statistics from ordinary least squares (OLS) regressions of cumulative abnormal returns (CAR) on *Reservation* for our sub-samples. The dependent variable is the cumulative abnormal return (CAR) over the [0/+1] event window. The estimation window is [-60/-30] and the sample period is 2004-2018. Panel A displays CARs partitioning the reservation sample by event impact (either impact on deficit or debt or not disclosed), event content (quantified effect of the reservation or unquantified one) and event year (initial estimate or not disclosed). Panel B displays CARs partitioning the sample by time period (2004-sept2009, oct2009-2018) and country type (GIIPS or Non-GIIPS countries). GIIPS refer to Greece, Ireland, Italy, and Portugal, Spain. Variable definitions are provided in Appendix A. t-statistics based on standard errors clustered at country level are displayed in parentheses below the coefficient estimates. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively, using two-tailed tests.

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