Sovereign Regulatory Risk-weight Privilege and Constitutional Fiscal Rules

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Abstract

The global financial crisis exposed the sovereign-bank nexus as a driver of financial instability and an impediment to economic growth. Less attention has been paid to fiscal effects. Accordingly, this study analyzes the interaction between the macroprudential regulation of banks' capital requirements and fiscal rules. We hypothesize that a conflict occurs between the regulatory privileged treatment of sovereign bonds held by banks and the market exposure logic enshrined in constitutional fiscal rules. This is particularly problematic in currency unions such as the US and the euro area. We estimate local projections to examine the reaction of sovereign fiscal positions in euro area member states to a restrictive macroprudential capital regulation shock. We find that peripheral euro area governments increase their debt following an unanticipated tightening in macroprudential capital regulation. This result lays bare that the macroprudential treatment is at odds with constitutional fiscal rules.

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1 Introduction

The global financial crisis exposed the close link between credit institutions and their domestic governments, the so-called *sovereign-bank nexus*, as a major cause of financial instability and an obstacle to economic growth (Acharya, Drechsler, and Schnabl, 2014; Bocola, 2016). In several countries, banking crises were followed by a rise in government debt because of bailouts, fiscal emergency measures, and widening of government bond spreads. The unfavorable interconnectedness between the domestic banking system and national governments is a defining feature of modern economies, with currency unions particularly vulnerable, as the euro debt crisis has shown (Becker and Ivashina, 2017; Reis, 2020).

Regulatory measures typically aim to strengthen financial stability, which lowers the probability of future banking crises. However, one remaining perennial flaw in banking regulation is the privileged treatment of sovereign exposure. Basel capital rules require banks to hold capital for all asset classes based either on a given regulatory risk weight or internally modeled default probabilities. However, while this principle of the Basel Accord has been rigorously applied to lending to corporations, its application in relation to sovereigns is generally much softer. In the US, federal government bonds are treated as zero weights, and bonds of US states and municipalities are assigned a weight of 20%. In the EU, banks are even permitted to assign a zero-risk weight for sovereign debt of all EU member states, and thus do not hold capital against any of the sovereign exposures. This privileged treatment causes a potential capital shortfall when a country's creditworthiness deteriorates (Gennaioli, Martin, and Rossi, 2014; Kirschenmann, Korte, and Steffen, 2020).

This study considers the tension of the sovereigns' regulatory risk-weight privilege with constitutional fiscal rules. The rationale of zero-risk weights for sovereign states is that when a country like the US has its own currency, the federal government can, in extremis, order the central bank to print money to sufficiently service its debt. Hence, the government repays its debt, at least in nominal terms; such nominal debt should be riskless. However, this rationale does not apply to currency union member states when the debtor governments, such as US states or euro area member states,

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are unable to print money to service their debt. Consequently, if government fiscal authorities are at a subordinate level to the monetary authority, the default risk on sovereign debt is not zero (Gros, 2013).

Constitutional fiscal rules enshrine the principles of fiscal discipline. Both under the US and the EU rules, a no-bailout clause governs the relationship between sovereigns. In principle, this clause bans governments or federal states from assuming the financial liabilities of sub-federal jurisdictions or other states, with the US federal level banned from rescuing US states just as the EU or any of its member states must not bailout another member state. The sovereign no-bailout principle applies the logic of market pressure on sovereigns for sovereigns to have an incentive to pursue fiscal discipline. By extension, the no-bailout logic implies that the regulatory treatment of government debt must not be designed to undermine fiscal discipline.

We assess whether the sovereigns' regulatory risk-weight privilege aligns with the constitutional fiscal rules. The research question is: *Does the risk-weight privilege lead sovereigns to lower fiscal discipline and undermine the purpose of fiscal rules*? Both the US and EU share a common fiscal constitutional rule to prohibit sovereign bailouts, and hence, build on the empirical premise that state intervention and regulation should not undermine budgetary discipline. Moreover, the regulatory treatment of sub-federal debt differs; as the EU considers member states' obligations entirely risk free and accords zero-risk weight, while the US requires a risk weight of 20% for US states and municipalities. Our hypothesis is that zero-risk weight undermines fiscal discipline (and hence fiscal rules) in times of fiscal distress, exacerbating the sovereign-bank nexus and financial and fiscal stability.

In our empirical analysis, we estimate local projections to examine the reaction of the sovereigns' fiscal position to an unanticipated tightening of macroprudential capital regulation. We focus on the euro area member countries, because the availability of US states fiscal data is severely restricted.[1] We divide the euro area

[1]First, US states' data on the fiscal position, such as the primary balance, government expenditures or government revenues, as well as bond yields are – to the best of our knowledge – not systematically reported on a quarterly basis. Second, to the extent that US states publish fiscal data, these data are inconsistent across states. Some states' definitions of deficit and revenue vary greatly, as they tend to separate the sections on expenditures and revenues. In addition, revenue structure is often complex because of the use of endowment funds, or the so-called "rainy days" funds, which can be drawn upon, thereby limiting the information on the primary balance.

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countries into two groups, the core and periphery, to consider possible structural heterogeneities across the entities. Such heterogeneities appear a priori likely, given the differences between the groups in terms of economic development before and after the global financial crisis (Hristov, Hülsewig, and Kolb, 2021). In particular, peripheral countries have come under fiscal distress in response to the sovereign debt crisis initiated in 2010 (Ongena, Popov, and Van Horen, 2019).

Our results show that the governments in the euro area peripheral countries increase their debt after a restrictive macroprudential capital regulation shock. The primary balance deteriorates, which is caused by an increase in government expenditures after deducting interest expenditures. Adjusting the components of the fiscal balance for cyclical influences suggests that the worsening in the primary balance is related to discretionary decisions as a consequence of a lower government bond rate. In contrast, we find that the primary balance remains unchanged in the core countries in response to a sudden tightening in macroprudential capital regulation.

Our study connects to two strands of literature: the sovereign-bank nexus literature as well as the constitutional fiscal rules scholarship. First, our study connects to a number of empirical studies that report a significant increase in banks' domestic government bond holdings in the peripheral countries following restrictive capital-based macroprudential policy measures (Acharya, Engle, and Pierret, 2014; Acharya and Steffen, 2015; Gropp et al., 2019; Hristov, Hülsewig, and Kolb, 2021, among others). The increase in banks' exposure to domestic sovereign debt indicates the strengthening of the sovereign-bank nexus, which reflects an unintended side-effect of bank capital regulation that is associated with the zero-risk weight (Acharya, Engle, and Pierret, 2014). In line with this finding, we show that public debt in the peripheral countries rises as well. Moral suasion by a sovereign may prompt banks to purchase additional domestic government bonds in times of fiscal distress (Ongena, Popov, and Van Horen, 2019). Moreover, banks may concentrate their portfolios on assets that receive a low-risk weight if poorly capitalized (Acharya, Engle, and Pierret, 2014; Acharya and Steffen, 2015).[2]

[2]In addition, banks with low capitalization tend to increase their capital ratio in response to higher capital requirements by reducing their risk-weighted assets rather than raising the level of equity (Gropp et al., 2019).

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Second, our analysis connects to the legal literature that examines the doctrinal basis and design of constitutional no-bailout clauses. Both in the US and the EU, the financial crisis gave rise to a discussion on how no-bailout regimes should be applied to financially distressed US states and euro area member countries. The legal literature discusses how the market logic of the no-bailout principle can be reconciled with various instruments granting fiscal support in federal relationships (see Peterson and Nadler (2012) and Johnson and Young (2012) for the US, and Steinbach (2013) and Palmstorfer (2012) for the EU). Our analysis contributes to the role of macroprudential policies in the interpretation of fiscal rules.

The study is structured as follows: Section 2 outlines the legal framework. Section 3 presents the empirical model, the data and the deviation of capital-based macroprudential policy shocks. Section 4 discusses the empirical results. Section 5 summarizes the legal implications of our empirical findings. Finally, Section 6 presents the conclusion.

2 Fiscal Rules and Macroprudential Regulation

2.1 Fiscal Rules and Budgetary Market Exposure of Sovereigns

Our empirical test explores the extent to which macroprudential preferential treatment runs counter to constitutional fiscal rules governing sovereign states' market exposure. Among these rules, the no-bailout clause is applicable to many jurisdictions. It aims to prevent governments or federal states from assuming the financial liabilities of sub-federal jurisdictions or other states. The US constitution does not foresee an explicit no-bailout clause, but there is an established and credible regime of not bailing out US States and municipalities (Peterson and Nadler, 2012). This implicit no-bailout regime exposes US states and municipalities to market pressure, incentivizing them to maintain fiscal discipline (Johnson and Young, 2012). Historically, US states increased their debt levels since the mid-1820s, mainly because to heavy investments in infrastructure, creating a bubble that finally burst in 1837 (Sinn, 2014). The federal level intervened for some time, buying up a great deal of the states' bonds but finally pursued a strict no-bailout policy. Since Congress allowed several states to default in the 1840s, its no-bailout commitment has been

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perceived as highly credible (Johnson and Young, 2012), though the financial crisis revived the debate on the federal government stepping in to bail out state at risk of default.[3]

Similar to the US, the EU Treaties built on the notion of fiscal responsibility and market exposure of sovereign states. Unlike in the US, there is an explicit ban on member states to assume the debt of a member state.[4] On more granular level, EU rules prohibit privileged access to financial institutions.[5] Financial institutions must not be forced to lend to EU or EU member states to allow markets to exert budgetary pressure on the sovereign entity. Hence, EU rules forbid any measure that establishes privileged access by EU institutions and the central government. This refers to financial advantages, which do not comply with the principles of a market economy, to encourage the acquiring or holding of government liabilities.[6] Consequently, the EU may not promote the acquisition or holding of government debt by financial institutions in a manner that undermines market mechanisms.

Thus, US and EU constitutional rules share the notion of enforcing market logic to incentivize budgetary discipline. They let market forces work, with lower interest rates rewarding fiscal soundness and rising interest rates signaling budgetary caution. To render these constitutional rules effective, financial markets assessments should assess the default probability of each member state individually. Granting economic advantages to financial institutions, which in turn create or are intended to create advantages for the public sector on the financial market in the private sector, is forbidden. Apart from direct bailouts, other indirect and regulatory ways undermine the logic of market exposure. We suggest that a zero-risk weight privilege is a regulatory treatment potentially conflicting with the market discipline concept of the no-bailout clause. Zero-weight privilege confers economic advantages to credit institutions to the extent that it exempts financial institutions from backing these

[3]State and Municipal Debt: The Coming Crisis? Hearing before the Subcommittee on TARP, Financial Services and Bailouts of Public and Private Programs of the House Committee on Oversight and Government Reform, 112th Cong, 1st Sess 1 (2011) ("State and Municipal Debt Hearings") (Rep Patrick McHenry).

[4]Article 125 TFEU

[5]Article 124 TFEU

[6]Article 1 paragraph 1 of Regulation No. 3604/93 of December 13, 1993, Treaty Establishing the European Community further specifies the definition of any measure establishing privileged access.

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loans with their own funds.

2.2 The Zero Weight (Un)Logic

The empirical question is whether macroprudential regulatory treatment undermines the constitutional fiscal principle. The regulatory treatment of sovereign bonds is governed by Basel capital requirements. Accordingly, banks must hold capital for all asset classes, either based on a given regulatory risk weight under the standardized approach or internally modeled default probabilities. Depending on the risk assessment by rating agencies, risk weights vary between 0% and 150% and are applicable to the standardized approach.[7] The underlying logic is that a good debtor creditworthiness results in low capital requirements, whereas low creditworthiness leads to high capital requirements; in theory, this regulatory approach follows the fiscal logic of no-bailout described above. However, as a deviation from this principle, Basel capital requirements determine the regulatory treatment of sovereign bonds. Under the standardized approach, sovereign bonds can be assigned a zero-risk weight when they are denominated and funded in domestic currency.[8] The zero-risk weight of sovereign bonds does not follow the otherwise mandatory risk-based valuation requirement.[9]

The US and EU have implemented Basel capital requirements differently in their respective macroprudential rules. We are interested in the treatment of sub-federal entities (euro area member states and US states), as they have no control over their currency and cannot simply print money to service their debts. This implies that when monetary and fiscal authorities are separate entities, the default risk of sovereign debt is not zero (Gros, 2013). Under US banking regulation, obligation exposures to US states, municipalities, and other political subdivisions of the US have a weight of 20%.[10] In contrast, the EU constitutional rules implementing the Basel

[7] Basel Committee on Banking Supervision, Basel III: Finalising post-crisis reforms, December 2017, paragraph 7.

[8] Basel Committee on Banking Supervision, Minimum capital requirements for market risk, January 2019, paragraph 22.7.

[9] By contrast, the internal model approach requires banks to assess the default risk of sovereign bonds in the trading book. This requirement also applies to government bonds that are denominated in the sovereign's domestic currency (BCBS, 2019, paragraph 33.21). Hence, under the Basel rules, the internal model approach does not grant privileged treatment to sovereign bonds.

[10] § 217.32 of Reg. Q, 78 FR 62157, 62285, Oct. 11, 2013 General risk weights. Federal Financial

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framework assign a 0% risk weight to exposures vis-à-vis member states denominated and funded in the domestic currency.[11] Hence, unlike in the US, exposure to EU member states is considered risk free regardless of the ratings assigned by rating agencies.[12] Therefore, even if a bank's internal risk model determines the risk weight of these exposures to be above zero percent, the credit institution may assign a 0% in the EU risk weight.

3 Model specification, data and macroprudential policy shocks

We base our empirical analysis on Jordà's (2005) local projection method, which allows us to examine the reaction of the fiscal balance to a capital-based macroprudential policy shock.

3.1 Baseline model

The linear model is given by:[13]

$$X_{i,t+h} = \theta_h \text{MPS}_t + \phi_h'(L) Z_{i,t-1} + \alpha_{i,h} + u_{i,t+h} \tag{1}$$

where $X_{i,t+h}$ is the variable of interest, subindex i denotes the country, MPS_t is an exogenous capital-based macroprudential policy shock, $Z_{i,t-1}$ is a vector of control variables, $\phi_h(L)$ is a polynomial in the lag operator, $\alpha_{i,h}$ captures country fixed effects, and $u_{i,t+h}$ is an error term. In our baseline model, the variables of interest are the primary balance ratio, that is the primary balance as a percentage of GDP, the government expenditures ratio, the government revenue ratio and the government balance ratio. The vector of control variables comprises lags of real output in logs, the government debt as a percentage of GDP, a measure of the monetary policy stance, the banks' domestic government bond holdings ratio, that is, the holdings of

Institutions Examination Council, FFIEC 051 RC-R-35, p. 43

[11] Article 114 paragraph 4 of EU Regulation 575/2013.

[12] Furthermore, even credit institutions that apply the Internal Ratings Based Approach (that is, allowing credit institutions to apply their own rating models to calculate the default risks) may apply the standardized approach for exposures to central governments, if these exposures are assigned a 0% weight (Article 150 paragraph 1 (d) (ii) of Reg. 575/2013 with reference to Article 114 of Reg. 575/2013).

[13] See Hristov, Hülsewig, and Kolb (2022) for a model that takes account of non-linearities.

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domestic government bonds relative to total assets, and a measure of fiscal stress. We impose a lag order of three for every control variable.[14]

The response of X at time $t+h$ to a capital-based macroprudential policy shock at time t is given by the estimated coefficient θ_h. Thus, the impulse responses are derived by estimating a series of single regressions for each horizon $h = 0, 1, 2, 3...H$ to generate a sequence of the θ_h's. We use the macroprudential capital regulation indicators of Hristov, Hülsewig, and Kolb (2021) to compute capital-based macroprudential policy shocks. The derivation of the shocks is discussed below. Moreover, we use the method of Driscoll and Kraay (1998) to calculate standard errors to account for the serial correlation in the error terms induced by the successive leading of the dependent variable (Ramey and Zubairy, 2018). As in Tenreyro and Thwaites (2016), we set the maximum autocorrelation lag to $H + 1$.

3.2 Data

Given the data limitations for the US states mentioned above, we focus on the empirical assessment of the euro area member countries. Since our sample is small, we adopt panel techniques. Due to structural heterogeneities across the entities, we consider two euro area member country groups, the core and periphery. All countries in the euro area fell into recession because of the global financial crisis. However, in the peripheral countries, the economic slack was substantial because of a loss of international price competitiveness, a deterioration of the banking sector's health, and a sharp increase in public and/or private debt. In addition, peripheral countries' sovereigns experienced substantial financial distress as interest rates on government bonds soared. Consequently, they faced increasing difficulties in issuing bonds in international capital markets.

Our data is obtained from the European Central Bank (ECB) and comprise quarterly time series.[15] We consider the period 2005Q1–2018Q4. The core countries include Austria, Belgium, Finland, France, Germany, and the Netherlands, while the peripheral countries consist of Ireland, Italy, Portugal, and Spain.[16] The panel

[14] Note that the results are robust against the choice of alternative lag orders.
[15] See the Appendix for details on the data.
[16] We exclude Greece from our analysis because the country was severely affected by the European

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approach allows us to pool diverse information from the two country groups while controlling for heterogeneity across the units by taking account of country-fixed effects. An advantage of the approach is that it increases the efficiency of statistical inference.

The fiscal data consist of the primary balance ratio, that is, the government primary deficit (-) or surplus (+) as a percentage of GDP; the government expenditures ratio, which is determined by the difference between total expenditures minus interest expenditures, both expressed as a percentage of GDP; government total revenue as a percentage of GDP; the government balance ratio, that is the government deficit (-) or surplus (+) as a percentage of GDP; the government debt as a percentage of GDP. Fiscal data are adjusted seasonally. Moreover, we use real GDP to measure economic activity.[17] The ECB's monetary policy stance is measured by the Euro Interbank Offered Rate's (EURIBOR) three-month rate. The banks' exposure to domestic sovereign debt is measured by their domestic government bond holdings ratio. The Sovereign Composite indicator of systemic stress (SocCiss) is used as a measure of stress in sovereign debt markets.[18] Finally, we use the government bond rate in an additional specification, which is a long-term yield with a ten-year maturity.

3.3 Derivation of macroprudential policy shocks

The use of local projections requires the shock to be exogenous. Therefore, we estimate panel vector autoregressive (VAR) models for the two euro area country groups, that is, the core and periphery, over the period 2005Q1 to 2018Q4, to derive structural innovations that can be interpreted as capital-based macroprudential policy surprises.

sovereign debt crisis and obtained external financing only through financial aid programs from May 2010 onwards.

[17]Note that the Irish GDP exhibits a shift of approximately 23% in 2015Q1 compared to the previous quarter. The shift in GDP was because the country's low corporate tax rates attracted cooperation from some large multinationals, which relocated their economic activity. We consider the structural break in Irish GDP by smoothing the series, that is, we retain the dynamics of the series but adjust for the shift.

[18]For robustness, we alternatively measure the ECB's monetary policy stance by the shadow short-rate derived by Krippner (2013), which considers both conventional and unconventional monetary policy measures.

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For every country group, the panel VAR model is specified as follows (Hristov, Hülsewig, and Kolb, 2021):

$$y_{i,t} = \sum_{j=1}^{p} B_j y_{i,t-j} + c_i + \varepsilon_{i,t}, \tag{2}$$

where $y_{i,t}$ is a vector of endogenous variables for country i, B_j is a matrix of autoregressive coefficients for lag j, p is the number of lags, c_i is a vector of country-specific intercepts that account for possible heterogeneity across the units, and $\varepsilon_{i,t}$ is a vector of reduced-form residuals. The vector of endogenous variables includes an indicator for capital-based macroprudential policy measures; the Basel gap, that is, the credit-to-GDP gap; lending spread between the loan rate and the EURIBOR three-month rate; Country-Level Index of Financial Stress (CLIFS) as an indicator of financial stress; and banks' government bond holdings ratio. We use the macroprudential policy indicator of Hristov, Hülsewig, and Kolb (2021), who derive country-specific indicators from the Macroprudential Policy Evaluation Database (MaPPED) provided by Budnik and Kleibl (2018), which summarizes information on changes in capital-based macroprudential policy measures. The indicators comprise adjustments in the MaPPED categories (i) "capital buffers", (ii) "loan-loss provisioning", (iii) "minimum capital requirements' and (iv) "risk weights". Each policy change is assigned a value of +1 if it is a tightening, -1 if it is a loosening, or zero if the intervention is characterized as "unspecified or with ambiguous impact" (Hristov, Hülsewig, and Kolb, 2021). If a country reports more than one policy change in a particular quarter, associated discrete values are added. Capital-based macroprudential policy indicators are constructed as the cumulative sum of quarterly values. Figure 1 displays the respective indicator for each country.

Regarding the elements of $y_{i,t}$ we use a pooled set of $M \cdot T$ observations, where M denotes the number of countries, and T is the number of observations. For each cross-sectional unit, the reduced-form residuals are assumed to be normally distributed with a homogeneous variance-covariance matrix Σ, that is, $\varepsilon_{i,t} \sim \mathcal{N}(0, \Sigma)$. After stacking the $\varepsilon_{i,t}$ into a vector $\varepsilon_t = [\varepsilon'_{1,t} \dots \varepsilon'_{M,t}]'$, we obtain $\varepsilon_t \sim \mathcal{N}(0, I_M \otimes \Sigma)$, where I_M is an identity matrix of dimension M.

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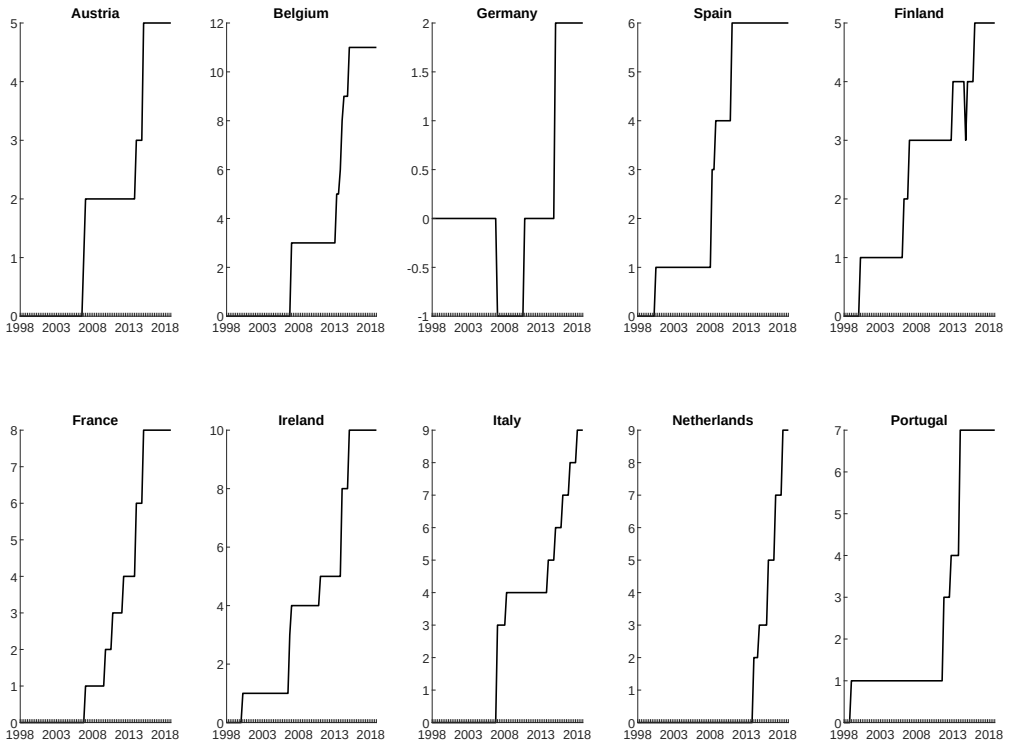
Figure 1: Capital-based macroprudential policy indicator



Notes: The figure shows the euro area countries' capital-based macroprudential policy indicators derived by Hristov et al. (2021), which measure the cumulative changes in capital-based macroprudential policy.

The panel VAR model (2) is estimated for every country group using Bayesian methods with a Normal-Wishart prior for the parameters. Inference is based on 10,000 draws from the corresponding posterior distribution. The relationship between the structural innovations $\eta_{i,t}$ and the reduced-form residuals is governed by $\varepsilon_{i,t} = A_0\eta_{i,t}$, which holds for each cross-sectional unit $i = \{1, ..., M\}$ and $\Sigma = A_0 A_0'$. The structural shock related to capital-based macroprudential policy is identified by imposing a recursive ordering. This is implemented by assuming that the matrix A_0 corresponds to the lower triangular element in the Choleski factorization of the variance-covariance matrix Σ of ε_t. The macroprudential policy indicator is ordered first and the corresponding orthogonal disturbance is interpreted as capturing the exogenous component of capital-based macroprudential policy.

The ordering implies that the macroprudential policy indicator reacts only to its own shock, while the reaction to all other shocks occurs with a lag of at least one quarter.. This identification scheme is based on the fact that macroprudential policy, unlike monetary policy, tends to be slow-moving. In particular, the adjust-

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ment of macroprudential instruments frequently suffers from inaction and delays in implementation (Knot, 2014; Arslan and Upper, 2017; Edge and Liang, 2020).[19]

For the local projections, we extract the structural innovations for both country groups from the estimated models by calculating the mean of the single shock series of the 10,000 draws. The structural shocks are standardized to have a mean of zero and a standard deviation of one.

4 Empirical results

4.1 Baseline model impulse responses

For the euro area country groups, we estimate Model (1) to derive impulse responses of the fiscal variables to a restrictive capital-based macroprudential policy innovation. Figure 2 summarizes the outcome. The dashed lines represent the estimated impulse responses. The shaded areas represent the 95% error bands.

We observe a notable difference in the reactions of the fiscal position across the country groups to a restrictive capital-based macroprudential policy shock. In the peripheral countries, the primary balance ratio declines. The maximum decrease to a one standard deviation macroprudential policy disturbance is approximately 0.5 percentage points. This decline is related to an initial increase in the government expenditures ratio. The government revenue ratio decreases, but hardly significantly. Moreover, the government balance ratio deteriorates, reaching a maximum decline of more than 0.3 percentage points. This suggests that the structure of the government budget is realigned toward higher public borrowing in response to a sudden macroprudential policy tightening.

Crosignani (2021) shows in a model that banks with low capitalization optimally allocate their portfolio of government bonds to domestic securities. An increase in banks' demand for domestic sovereign debt, for instance, as a result of a tightening in the capital requirement, lowers the interest rate on government bonds, which

[19] Note that we find that our results are robust against alternative orderings, in which the macroprudential policy indicator reacts on impact to other shocks. The results are not reported here, but are available upon request.

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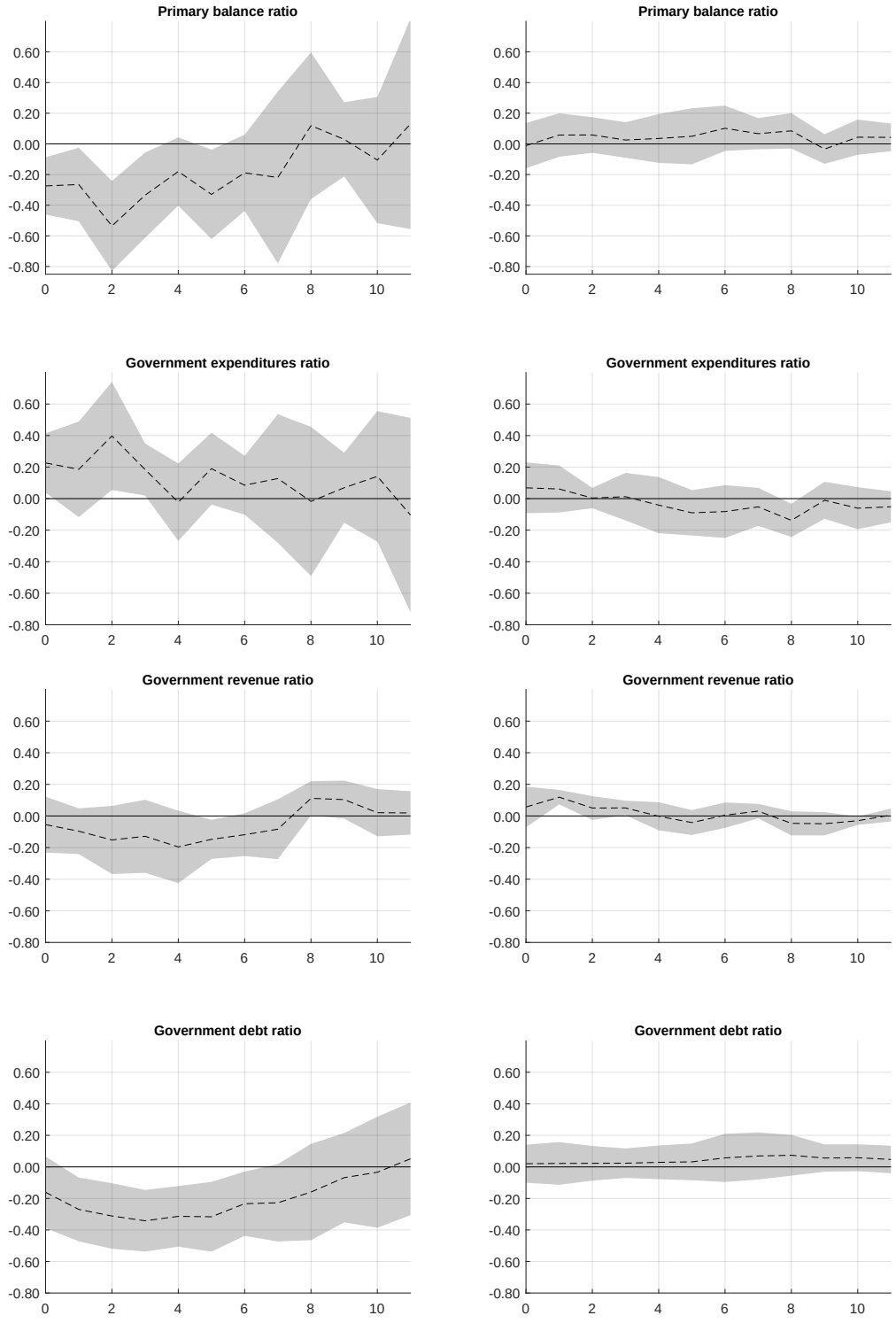
Figure 2: Impulse responses to a restrictive macroprudential policy shock



Notes: The figure shows impulse responses to an exogenous restrictive capital-based macroprudential policy shock. The dashed lines denote the estimated impulse responses. The shaded areas reflect the 95% error bands. The reactions of all variables are measured in percentage points. A positive value of the primary balance ratio and government deficit/ surplus ratio denotes an improvement, while a negative value reflects a deterioration.

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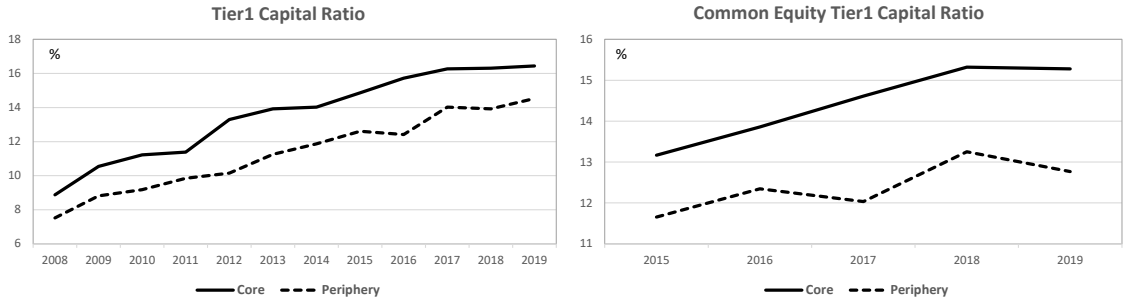
supports government debt capacity. Figure 3 displays for both country groups, that is, the core and periphery, that peripheral bank capital ratios are comparatively low.

Figure 3: Regulatory capital ratios, averages for each country group



Notes: The figure builds on Hristov, Hülsewig, and Kolb (2021). Regulatory capital as a percentage of risk-weighted assets. Weighted averages across countries in the corresponding country group. Each country-specific value is weighted by the ratio $TA_{i,t}/\sum_{i=1}^{N} TA_{i,t}$, where $TA_{i,t}$ are the total assets of country i's banks and $\sum_{i=1}^{N} TA_{i,t}$ are banks' total assets in the corresponding country group. The length of time series is restricted by the data availability. Source: ECB Statistical Data Warehouse.

Against this background, empirical studies report that the sovereign exposures of peripheral banks increase after a restrictive capital-based macroprudential policy shock (Acharya, Engle, and Pierret, 2014; Acharya and Steffen, 2015; Gropp et al., 2019; Hristov, Hülsewig, and Kolb, 2021). Since banks are important investors in domestic government debt (Arslanalp and Tsuda, 2014; BCBS, 2017), the shift toward higher sovereign exposure may exacerbate the adverse effects of the sovereign-bank nexus to the extent that sovereign risk increases. Our findings contribute to this result by showing that the government fiscal balance in the peripheral countries worsens after a restrictive capital-based macroprudential policy innovation. Thus, government borrowing increases. By contrast, in the core countries, the primary balance ratio does not respond to a sudden macroprudential policy tightening. The government expenditure ratio remains unchanged, while the government revenue ratio increases temporarily, but moderately. The government balance ratio also remains unchanged.

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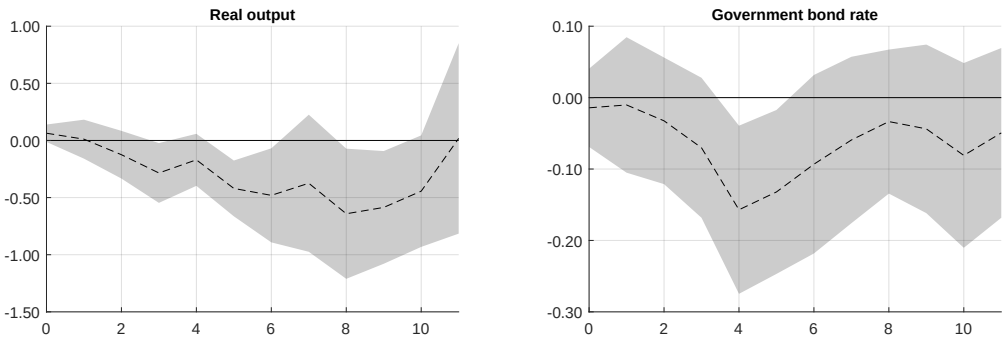
4.2 Discussion

For peripheral countries, our findings suggest that the deterioration of the primary balance ratio is triggered by a temporary rise in government expenditures, which results in an increase in government borrowing. Governments may make discretionary decisions on their fiscal balance because increasing borrowing becomes attractive because of lower interest rates on government bonds as a result of tightening capital requirements (Crosignani, 2021). However, the worsening of the fiscal balance may also result from a temporary economic downturn caused by more stringent capital requirements. For example, Meeks (2017), Budnik and Rünstler (2020) and Ampudia et al. (2021) show that for the UK, the euro area, and the US real output falls in response to a restrictive shock to capital-based macroprudential regulation. The decline in output can be temporary (Budnik and Rünstler, 2020), or longer-lasting. Moreover, Gropp et al. (2019) conclude that capital requirements that target the regulatory capital ratio have potentially adverse effects on the real economy.

In the following, we estimate Model (1) for two additional variables of interest: real output in logs and the government bond rate. The vector of control variables comprises lags of real output, the inflation rate, which is calculated as the annual rate of change of the harmonized consumer price index, the government bond rate, our measure of the monetary policy stance and our measure of financial stress. Again, we impose a lag order of three. Figure 4 displays the impulse responses together with the respective 95% error bands.

Figure 4: Additional periphery countries variables' impulse responses



Notes: The figure shows impulse responses to an exogenous restrictive capital-based macroprudential policy shock. The dashed lines denote the estimated impulse responses. The shaded areas reflect the 95% error bands. The reaction of real output is in percent. The reaction the government bond rate is in percentage points.

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Real output declines after a restrictive capital-based macroprudential policy shock. The maximum decrease is 0.6 percent. Thus, the economic conditions deteriorate, which may induce an increase in government borrowing. The government bond rate also falls in response to the shock. The maximum drop to a one standard deviation macroprudential policy disturbance is approximately 16 base points. Hristov, Hülsewig, and Kolb (2021) report a similar result, with the decline in the yield on sovereign bonds being even more persistent. This suggests that government borrowing becomes more attractive after an unexpected capital-based macroprudential policy tightening because of a lowering of the government bond rate. Thus, the worsening of the primary balance ratio may be driven by both a decrease in real output and a drop in the government bond rate.

4.3 Cyclical adjustment

As we are interested in identifying the discretionary decisions of fiscal policy after a shock we adjust the fiscal variables cyclically (Hristov, Hülsewig, and Kolb, 2022). For this purpose, we estimate the following equation:

$$X_{i,t} = \beta_j \sum_{j=0}^{p} g_{i,t-j} + c_i + u_{i,t}, \tag{3}$$

where $X_{i,t}$ is the fiscal variable of interest of country i, $g_{i,t}$ is the output gap, c_i is a constant, and $u_{i,t}$ is an error term. The output gap is calculated as the relative deviation of real GDP from the potential output, which is approximated by the real output trend. We use the Hodrick Prescott filter to calculate this trend. The lag order is set to $p = 4$.[20] The cyclical-adjusted fiscal variables are derived from (3) using the respective error terms.

Finally, we re-estimate Model (1), but with the cyclically adjusted fiscal variables. The results are summarized in Figure 5. We find that the deterioration in the cyclically adjusted primary balance ratio in peripheral countries following a restrictive capital-based macroprudential shock can be related to discretionary decisions. This suggests that governments increase their debt after capital regulation is tight-

[20] Note that the results of the cyclical adjustment are robust against different lag orders.

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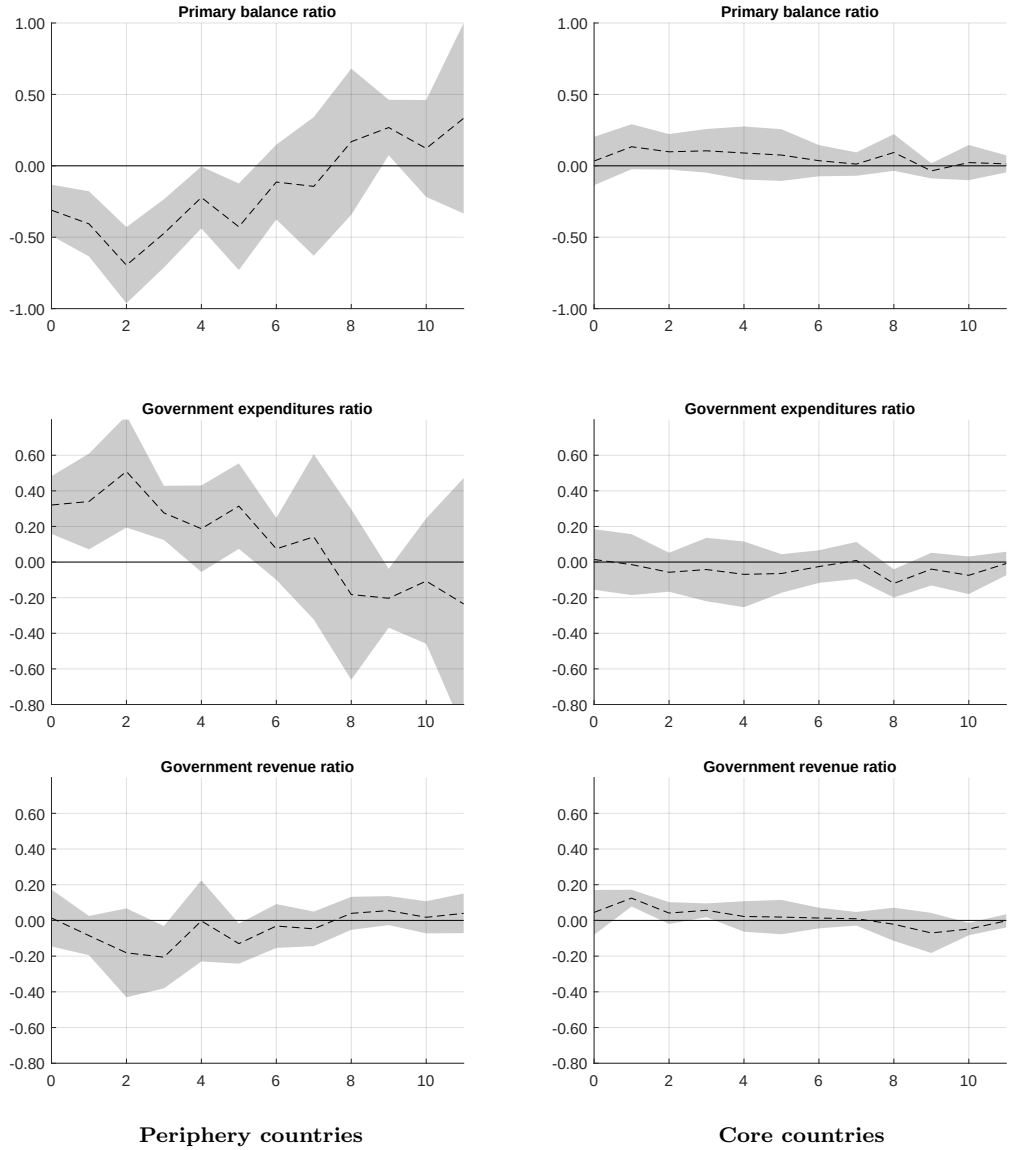
ened, which may be associated with the incentive to increase borrowing because of the reduction in the government bond rate. By contrast, in the core countries, the cyclically adjusted primary balance ratio remains unchanged after the shock.

Figure 5: Impulse responses of cyclical-adjusted fiscal variables



Notes: The figure shows the impulse responses of the cyclical adjusted fiscal variables to an exogenous restrictive capital-based macroprudential policy shock. The dashed lines denote the estimated impulse responses. The shaded areas reflect the 95% error bands. The reactions of all variables are measured in percentage points. A positive value of the primary balance ratio denotes an improvement, while a negative value reflects a deterioration.

5 Reviewing the legal governance of zero weights

The empirical analysis underscores how the regulatory privileged treatment of government bonds conflicts with the logic underlying constitutional fiscal rules. The

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euro area peripheral countries' fiscal policy takes advantage of a restrictive shock to macroprudential capital regulation by increasing borrowing. Credit extensions to the government may become more attractive because of the zero-risk weights. We observe a decrease in the primary balance in response to the shock, which comes along with a temporary increase in government expenditures less interest expenditures. Simultaneously, the government bond rate decreases.

The empirical evidence highlights that zero weighting is at odds with the idea of market pressure on sovereigns as foundational principle of constitutional no-bailout clauses. The regulatory conferral of privileged access by central governments to financial institutions lifts market pressure and reduces budgetary discipline. While the US incorporates its constitutional no-bailout clause into the macroprudential treatment by requiring a 20% risk weight for obligations of US states, the EU acts in contradiction to the no-bailout regime. The zero-risk weight furthers the risk of fiscal instability and ultimately the risk of bailout. Pressure to bail out EU member states increases considerably if a state default causes a European banking crisis. Therefore, as long as the zero-risk weight privilege and thus the sovereign-bank nexus exists, the credibility of the no bailout clause is reduced (Hauser, 2020).[21]

Considering the rationale of exempting sovereign bonds from the banks' risk valuation, the exemption would be sensible, as these bonds are risk free. The intention of the drafters of the relevant EU zero-risk regulations is revealed in this regard: the legislator opined that "public debt paper is usually relatively liquid and the government is, in principle, a good debtor because of its prerogative to raise taxes, so that it is justified to make sure that financial institutions observe certain prudential measures leading to the holding of public debt paper" (European Commission, 1993, p. 15). While privileged access builds on the assumption that government bonds are risk free, this reasoning is not valid in the context of currency areas such as the US or the euro area, when the debtor government (US or EU member states) has no power to create and print money to serve its debt, but where this authority lies with the federal or supranational level.[22] When monetary and fiscal authorities are

[21]Moreover, the finding is also at odds with the treaty-based rule, which bans privileged access to financial institutions (Article 124 TFEU).

[22]The ECB is forbidden to provide monetary financing to any government or even to EU author-

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separate entities, default risk on sovereign debt is not zero (Gros, 2013). The recent crises revolving around sovereign debt in both the US and the EU have shown that member states also have default risks, although varying (Johnson and Young, 2012; Atik, 2016).

One might argue that macroprudential considerations could trump fiscal rules concerns, building on the rationale that financial stability concerns vested in macroprudential regulations should have primary concerns over budgetary effects. From a legal perspective, EU law provides an explicit exception to the prohibition of measures giving privileged access of public entities to financial institutions – 'prudential considerations' can make preferential treatment necessary for financial stability reasons.[23] 'Prudential considerations' are considered measures designed to promote the soundness of financial institutions to strengthen the stability of the entire financial system and the protection of the customers of those institutions.[24] Indeed, macroprudential policy aims to strengthen financial stability, particularly through capital-based instruments. However, the empirical evidence available does not support that zero-risk weight privilege stabilizes financial stability. Rather, banks in the periphery increase their exposure to domestic government debt in response to tighter capital-based regulatory measures (Acharya, Engle, and Pierret, 2014; Acharya and Steffen, 2015; Gropp et al., 2019; Hristov, Hülsewig, and Kolb, 2021), making them more vulnerable to sovereign risk. Losses they suffer from the write-off of sovereign debt because of a deterioration in the sovereign's creditworthiness weakens their capital position. Consequently, banks become undercapitalized if they fail to build a sufficient capital buffer (Kirschenmann, Korte, and Steffen, 2020).

ities. In other constituencies, monetary financing is not prohibited. See Hülsewig and Steinbach (2021) for a discussion.

[23] Article 124 TFEU outlines a carve out of the prohibition of privileged access of the public sector for prudential considerations.

[24] Article 2 of Council Regulation (EC) No 3604/93 of December 13, 1993, specifying definitions for the application of the prohibition of privileged access referred to in Article 104a of the Treaty establishing the European Community.

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6 Conclusion

Macroprudential regulation of financial institutions is explored from the perspective of contributing to financial stability and economic growth. Little attention has been paid to its fiscal effects. However, this is particularly relevant with regard to the regulatory treatment of sub-federal entities in currency unions, as currency areas stipulate no-bailout regimes, establishing the primacy of market pressure on sovereign bonds. We show that peripheral euro area governments' primary balance deteriorates in response to tightening macroprudential capital regulation. Thus, macroprudential privileges awarding zero-risk weight undermine fiscal discipline. Fiscally distressed governments benefit from the regulatory privileged treatment of domestic sovereign bonds because of the lowering of the government bond interest rate in response to restrictive capital-based macroprudential policy measures. Hence, the prevailing macroprudential arrangement undermines the constitutional fiscal rules of the currency areas.

The adverse fiscal effect adds to the well-established repercussions of the privilege of sovereigns in macroprudential regulation, demonstrating the destabilizing effects on financial stability and economic activity (Hannoun, 2011). There is widespread use of the zero-weight privilege, prevalent with currency unions such as the euro area, as the contagious effect of fiscal instability materializes considerably in currency areas. The sovereign debt crisis was at least partially driven by lax fiscal policies in several advanced countries as members of currency unions. This experience underscored that sovereign bonds should not be considered to be risk free. The core policy conclusion is that national rules implementing Basel global standards should not underestimate the sovereign risk exposures of domestic banks.

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Data

A Local projections

ECB Statistical data Warehouse:

- Gross domestic product at market prices, chain linked volume
  MNA.Q.Y.XX.W2.S1.S1.B.B1GQ._Z._Z._Z.EUR.LR.N
- Harmonized Consumer Price Index
  CP.M.XX.N.000000.4.INX
  This was converted to quarterly data using monthly averages. The Harmonized Consumer Price Index (HICP) inflation rate was calculated as the annual rate of change
- Government primary balance as % of GDP, deficit (-)/ surplus (+)
  GFS.Q.N.XX.W0.S13.S1._Z.B.B9P._Z._Z._Z.XDC_R_B1GQ._Z.S.V.N._T
- Government total expenditures as % of GDP
  GFS.Q.N.XX.W0.S13.S1.P.D.OTE._Z._Z._T.XDC_R_B1GQ._Z.S.V.N._T
- Government interest expenditure as % of GDP
  GFS.Q.N.XX.W0.S13.S1.C.D.D41._Z._Z._T.XDC_R_B1GQ._Z.S.V.N._T
- Government total revenue as % of GDP
  GFS.Q.N.XX.W0.S13.S1.P.C.OTR._Z._Z._Z.XDC_R_B1GQ._Z.S.V.N._T
- Government deficit/ surplus as a % of GDP, deficit (-)/ surplus (+)
  GFS.Q.N.XX.W0.S13.S1._Z.B.B9._Z._Z._Z.XDC_R_B1GQ_CY._Z.S.V.CY._T
- Government debt as % of GDP
  GFS.Q.N.XX.W0.S13.S1.C.L.LE.GD.T._Z.XDC_R_B1GQ_CY._T.F.V.N._T
- MFIs' holdings of domestic government bonds, outstanding amount (stock) in millions of euro, monthly frequency
  BSI.M.XX.N.A.A30.A.1.U6.2100.EUR.E
  This is converted to quarterly data using end-of-period monthly values

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- Total assets of a country's MFIs, outstanding amount (stock) in millions of euro, monthly frequency

  BSI.M.XX.N.A.T00.A.1.Z5.0000.Z01.E

  This is converted to quarterly data using end-of-period monthly values

- EURIBOR 3-month rate

  FM.M.U2.EUR.RT.MM.EURIBOR3MD_.HSTA

  This was converted to quarterly data using monthly averages

- Sovereign composite indicator of systemic stress

  CISS.M.XX.Z0Z.4F.EC.SOV_CI.IDX

  This is converted to quarterly data using monthly averages

- Government bond rate

  IRS.M.XX.L.L40.CI.0000.EUR.N.Z

  This was converted to quarterly data using monthly averages

- Harmonized index of consumer prices

  ICP.M.XX.N.000000.4.INX

  This is converted to quarterly data using monthly averages

In the series' codes XX is a placeholder for the country acronym: Austria (AT), Belgium (BE), Finland (FI), France (FR), Germany (DE), the Netherlands (NL), Ireland (IR), Italy (IT), Portugal (PT), and Spain (ES). All data were seasonally adjusted using the IRIS Macroeconomic Modeling Toolbox.

B Panel VAR model: additional variables

Bank of International Settlements:

- Basel-gap

  Q:XX:P:A:C

ECB Statistical data Warehouse:

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- The lending rate is computed as the weighted average over the lending rates on NFC loans and loans for house purchase. The weights correspond to the respective share of NFC loans and loans for house purchase.

    1. MFI volume of loans non-financial corporations (NFCs), monthly frequency, end-of-period stock,
       BSI.M.XX.N.A.A20.A.1.U6.2240.Z01.E
    2. MFI volume of loans to households for house purchase, monthly frequency, end-of-period stock,
       BSI.M.XX.N.A.A20.A.1.U6.2250.Z01.E
    3. Lending rate on loans to NFCs, new business, monthly frequency,
       MIR.M.XX.B.A2A.A.R.A.2240.EUR.N
    4. Lending rate on loans to households for house purchase, new business, monthly frequency,
       MIR.M.XX.B.A2C.A.R.A.2250.EUR.N

    These series were converted to quarterly averages based on the monthly observations.

- Financial stress indicator
  CLIFS.M.XX._Z.4F.EC.CLIFS_CI.IDX
  This is converted to quarterly data using monthly averages

Capital-based macroprudential policy indicators:

- Hristov et al. (2021)

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