The Price of Law:
The Case of the Eurozone Collective Action Clauses

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Collective Action Clauses (CACs) are among the most debated contract provisions in the world of sovereign finance. They provide a mechanism by which a majority of creditors can vote on modifications of the payment obligations to the debtor, while binding the minority of creditors. In theory, their impact on the cost of capital is unclear, since they have the potential to generate both costs (easier for the debtor to default) and benefits (reduced likelihood of hold outs). In this paper we study the impact of the introduction of CACs in Euro area sovereign bonds in January 2013 on secondary market yields. We find the following. First, the markets appear to price the new contract term, i.e., bonds with CACs trade at lower yields than otherwise similar bonds that do not include CACs. Second, the yield differential between the two types of bonds decreases in a country's creditworthiness. Third, the quality of the legal system matters to whether, and how, markets price these contract terms: The better the legal system, the larger is the yield reduction associated with CACs. The results suggest that CACs protect investors, and in particularly so when the sovereign is more likely to be in distress and in countries with better legal systems.

(*JEL classifications:* F33, G12, H63, K12)

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Collective Action Clauses (CACs) provide a mechanism by which a majority of creditors can vote on modifications of the payment obligations to the debtor, while binding the minority of creditors. CACs are among the most debated contract provisions in the world of sovereign finance. In theory, their impact on the cost of capital is unclear, since they have the potential to generate both costs (easier for the debtor to default) and benefits (reduced likelihood of hold outs). In this paper we study the impact of the introduction of CACs in Euro area sovereign bonds in January 2013 on secondary market yields. We find the following. First, the markets appear to price the new contract term, i.e., bonds with CACs trade at lower yields than otherwise similar bonds that do not include CACs. Second, the yield differential between the two types of bonds decreases in a country's creditworthiness. Third, the quality of the legal system matters to whether, and how, markets price these contract terms: The better the legal system, the larger is the yield reduction associated with CACs. The results suggest that CACs protect investors, and in particularly so when the sovereign is more likely to be in distress and in countries with better legal systems.

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The European sovereign debt crisis that led to the 2012 Greek restructuring has revived discussions about the design of sovereign debt contracts and the pricing of contract provisions. These issues have been at the forefront of the policy and academic debate since the mid-1990s, when provisions specifying the minimum vote to modify payment terms (so-called Collective Action Clauses, henceforth abbreviated as "CACs") were introduced as a contractual solution to avoid prolonged and costly battles following a default (Panizza, Sturzenegger and Zettelmeyer (2009); Aguiar and Amador (2014)).

The interest in CACs and their impact began with the Mexican "Tequila" crisis in 1995 and the following extensive debate over whether the international system needed either a statutory sovereign bankruptcy regime or a contractual solution entailing CACs as a way to facilitate sovereign restructuring (see Häseler (2009)).[1] Within this debate, the relevance of CACs on the pricing of debt was extensively discussed, but a consensus is still lacking.

[1] The policy debate focused on emerging market countries issuing bonds to foreign investors under New York law, centered around the IMF proposal of a statutory sovereign debt restructuring mechanism. Failing to achieve consensus, the proposal was shelved and the inclusion of CACs prevailed as the only viable solution to facilitate debt restructuring for emerging countries (Gelpern and Gulati (2009)). The need for a bankruptcy regime for sovereigns (similar to the one that applies to

Theory is ambiguous concerning the extent to which the design of sovereign debt contracts matters as CACs introduce a trade-off from investors' perspective. Kletzer (2004) and Haldane, Penalver, Saporta and Shin (2005) show that CACs improve the coordination among creditors and thus reduce the hold out problem, although they may induce delays in negotiation (Pitchford and Wright (2012)). In this respect, CACs represent pro-creditor provisions since, by facilitating restructuring, they improve investors' recoveries in case of sovereign default. This in turn translates into lower bond yields. By contrast, Dooley (2000) and Shleifer (2003) argue that, as they make restructuring easier, CACs encourage opportunistic behavior on the side of the borrower in terms of strategic default, thus worsening the agency problem between government and creditors. From this perspective, CACs are anti-creditor provisions and lead to higher yields.

In trying to disentangle which of these two effects dominates, the empirical literature has not reached consensus. While some studies do not find pricing differences associated with CAC provisions (e.g., Richards and Gugiatti (2003)), others document that the significance of the price impact depends on borrowers' creditworthiness. Among these, CACs are associated with lower yields for good quality issuers and higher yields for bad quality issuers (Eichengreen and Mody (2004)), lower yields for bad quality borrowers only (Bradley and Gulati (2014)), or lower yields for middle quality issuers only (Bardozzetti, 2014 #3519}). Overall, the trade-off between orderly restructuring and moral hazard is far from resolved.

Although these studies employ different samples (issuers and time period, primary versus secondary market), they share the focus on foreign law bonds issued by emerging countries. This bears on the analysis and its economic relevance in different ways. First, there is the matter of how to measure CACs. Many authors use the governing law as a proxy for the presence (or absence) of CACs and thus treat CAC provisions as a binary variable. The typical assumption, particularly in the early papers on this topic, was that bonds issued under English law have CACs, while those under New York law do not. However, as shown in Bradley and Gulati (2014), English and New York law bonds differ in contractual terms other than the inclusion of CACs; and the qualified threshold of creditors required for amending payment terms displays variation across contracts - even conditioning on the same law. Second, there is the question of how to identify the price impact of CACs. When issuing under foreign law, the vast majority of countries make use of either English or New York law, but rarely both. Thus,

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banks and non-financial firms) has recently gained renewed momentum (Bolton (2016)), along with proposals for a more explicit seniority structure (Chatterjee and Eyigungor (2015)).

even taking the jurisdiction of foreign law as a valid proxy for CAC provisions, the identification of the pricing effect comes from cross-country variation. Lastly, there is the concern about the sample size as most studies focus on foreign law bonds issued by emerging market countries which constitute only a sliver of the total government bond market (Gelpern and Gulati (2013)).

Our goal in this paper is to study the pricing impact of CACs by making use of in a unique event – the mandatory introduction of CACs in bonds of Eurozone countries as of January 1, 2013. This initiative mandated the introduction of the same clause, which allows modification of the payment obligations subject the approval of qualified majorities of creditors, to all Eurozone countries, irrespective of the characteristics of the issuer and the law governing the issuance. In this respect, the Euro CAC initiative was exogenous to any particular Eurozone country.

Despite the Euro CACs applying to bonds under both foreign and domestic law, we focus our analysis only on the latter. We do this for three reasons. First, we want to keep law fixed (domestic law) so as to better disentangle the impact of CAC provisions rather than mixing contract provisions with contract law. In other words, the inclusion of standardized and identical contract terms mandated by the Euro CAC initiative allows us to keep law fixed (e.g., German or Irish law) across a set of contracts and safely regard CACs inclusion as a binary variable.

Second, the countries in our dataset issue the overwhelming majority of bonds under domestic law, while reverting to foreign law bonds only very sporadically. Thus, the focus on domestic law allows us to adopt a matching methodology whereby we compare bonds with similar characteristics (including the law) except the new provision. This methodology allows us to analyze the price effect of CACs *within* countries rather than *across* countries, and better disentangle the effect of the new contract provision.

Finally, focusing on domestic (as opposed to foreign) law bonds allows us allows us to bring an understudied dimension to the debate by linking the price impact of CACs to the quality of the legal system.[2]

We base our analysis of CACs under domestic law on the main insights of the literature on CACs under foreign law. As done in that context, we consider CACs to entail a trade-off between the benefits of more orderly restructurings on the one hand and the greater likelihood of strategic misbehavior by the government on the other hand. We do this although we recognize that there may be differences in the enforcement of contract provisions across different laws. In particular, while it is the case that a

[2] See also, Ratha, De and Kurlat (2018), comparing the pricing effects of CACs under New York law to those under English law.

local court might feel under greater pressure when the defendant in the case is its own government, the reason most developed nations are able to issue debt under their own laws is that they have built strong domestic institutions (such as independent judiciaries) to ensure that promises made by the governments themselves are considered credible. To this end, most developed nations have domestic statutory and sometimes constitutional protections that allow for legal claims to be brought against the local government in the event of expropriation. This does not mean however that a creditor enjoys the same protection in a contract irrespective of the law the contract is written in. Rather one would expect that investors value the credibility of the legal systems as a protection against expropriation and thus are willing to pay a premium in proportion to the credibility of the legal system (Bradley, de Fontenay, de Lira Salvatierra and Gulati (2018)).[3] Along these lines, the fact that the Euro area CAC initiative of January 2013 mandated the adoption of the same contract term across multiple different legal jurisdictions allow us to examine whether the impact of the CAC reform on yields is a function of the credibility of the legal system under which the CAC is adopted.

We start our analysis by developing a very simple model of sovereign lending to illustrate the main trade-offs involved in the introduction of CAC bonds. The framework, based on Bolton and Jeanne (2009), has two main features. First, the sovereign is plagued by a classic "willingness-to-pay-problem", as in Eaton and Gersovitz (1981) due to weak contractual enforcement. Second, given the sovereign has outstanding creditors holding different debt instruments (i.e., bonds with CACs and bonds without CACs), it can treat them differently in terms of repayments depending on the contractual features of the two bonds. The possibility of "selective default" implies that the two types of bonds may entail different yields in equilibrium.

We show that the yield differential between CAC and no-CAC bonds depends on the likelihood of the sovereign engaging in a partial default (i.e., restructure the CAC bonds while defaulting on the no-CAC bonds) versus strategic default (i.e., restructure the CAC bonds, while honoring the no-CAC bonds in full). When the former dominates, CAC bonds should trade at a premium relative to no-CAC bonds, while the opposite is true when strategic default is more relevant. Moreover, our model predicts the yield differential to be larger in countries with worse ratings and with better legal system.

To test these implications, we compare the secondary market yields of Eurozone bonds issued under domestic law after January 1, 2013 (i.e., bonds with CAC provisions) with those of bonds issued prior

[3] In line with this idea, prior research has shown that investors, even in the Euro area, and particularly during crisis times, pay a small premium for sovereign bonds under foreign as compared to local laws (Chamon, Schumacher and Trebesch (2018)).

to that date (i.e., bonds without CAC provisions). Given the large number of bonds issued by Eurozone countries under domestic law, we are able to match CAC bonds with no-CAC bonds issued by the same country, under the same law, denominated in the same currency and with similar residual maturities. Thus, we identify the price impact of CACs within countries rather than across countries, and using bonds that are close substitute.

We find a significant yield differential: our estimates indicate that yields on CAC bonds are, on average, lower by 8 to 17 basis points (bps) than those of matched no-CAC bonds. Moreover, the yield differential between CAC and matched no-CAC bonds is persistently negative and statistically significant throughout the sample period.

We then turn to test the model predictions that relate the price impact of CACs to the sovereign creditworthiness and quality of the legal system. To this end, we make use of cross-country heterogeneity in credit ratings and in quality of law indicators to examine whether the value of these contract provisions varies with investors' expectation concerning country creditworthiness and legal enforcement. Consistent with the model, we document that the yield differential on CAC bonds relative to no-CAC bonds widens in countries with worse ratings and in those with stronger legal systems.

Finally, we consider a falsification exercise where we assume that the Euro CAC initiative took place two years earlier than it actually did. To this end, we compare secondary market yields of pseudo-CAC bonds – i.e. Eurozone bonds issued under domestic law after January 1, 2011 – with those of same-issuer, same-law, same-currency bonds issued prior to that date (i.e., pseudo no-CAC bonds) that have similar residual maturities. Repeating all our analyses on this sample of bonds, we find no evidence of yield differentials across these bonds.

To sum up, we document that CAC provisions in the domestic-law debt issued by Euro area countries are viewed favorably by market participants. We interpret this result as suggesting that the trade-off entailed by the CACs in terms of the benefits of more orderly creditors' coordination versus the potential moral hazard costs from strategic default is resolved in favor of the former in our data sample. Anticipating this, investors are ready to pay higher prices for CAC bonds. Further, this price impact is more pronounced in countries with a sizable probability of partial default and, importantly, with a good quality legal system.

Our paper relates to various strands of literature. First, being a study of the price impact of contract terms, our paper contributes to the literature analysing covenants in debt contracts (e.g., Smith and Warner (1979), Asquith, Beatty and Weber (2005), Bradley and Roberts (2015)).

Second, the view that the quality of the legal system affects the enforcement of contracts links our paper to the literature on institutions as defendants against property rights expropriation attempts by local governments (North and Weingast (1989); Stasavage (2002); Acemoglu and Johnson (2005); Breen and McMenamin (2013)). Specifically, the separation between enforcement and legislative bodies in our context works as a "checks and balances" mechanism against abuses of legislative power as described in Persson, Roland and Tabellini (1997).

Third, the paper relates to the growing literature on the relationship between effectiveness of courts and the evolution of contract provisions or economic outcomes (see, e.g., Anderlini, Felli and Riboni (2014); Gennaioli and Ponzetto (2015) for theoretical contributions; and Djankov, La Porta, Lopez-de-Silanes and Shleifer (2003); Lerner and Schoar (2005); Qian and Strahan (2007) for empirical studies on the relationships between court enforcement and financial contracts such as mortgages or bank loans). Among these contributions, our study is most closely related to papers analyzing the impact of the quality of the legal system on trade. For example, in line with our result that better quality of law increases the price differential between CAC and no-CAC bonds, Levchenko (2007) and Nunn (2007) find that countries with good contract enforcement specialize in the production and export of goods for which relationship-specific investments are most important.

The paper is organized as follows. Section I provides the background on the Euro CAC initiative and sets forth our predictions with the use of a simple model. Section II describes the dataset construction. Section III presents the empirical findings on the average price impact of CAC provisions, while Section IV exploits country heterogeneity. Section V presents some further results in terms of falsification tests and case studies. Section VI concludes.

I. Background on the Euro CAC initiative and hypotheses

CACs are contract provisions that generally allow for a supermajority of creditors in a single bond, or across bonds, to vote on modifications of the payment obligations to the debtor (with the permission of the debtor). By doing so, the provisions permit the debtor and a majority of creditors to agree to a reduction in the amount that the debtor owes in a fashion that forces the deal on a minority of dissenting creditors, thereby reducing holdouts (Eichengreen and Portes (1995)). In this sense, CACs are seen as a way to ameliorate the inefficiencies caused by intra-creditor problems, thus allowing investors to recover more in case of default of the sovereign (e.g., Haldane, Penalver, Saporta and Shin (2005)). Yet, by facilitating restructuring, CACs also may exacerbate the moral hazard problem

embedded in the sovereign's lack of "willingness to pay" (e.g., Eaton and Gersovitz (1981)), whereby sovereigns cannot commit to repay creditors independently on their true payment capacity. Given this trade-off, the effect of CACs on bond yields is ambiguous, as it ultimately depends on the ability of the sovereign to pay and the political domestic constraints under which it operates.

While being present in almost all foreign-law sovereign bonds since early 2000s, CACs have been almost completely absent in domestic-law bonds until the 2013 Euro CAC initiative. In this section, we describe the background of the Euro CAC initiative and then develop a simple model to derive predictions for our empirical analysis.

A. Euro CAC initiative

The sovereign debt crisis that hit the Eurozone in 2010-2013 developed in a number of stages culminating in the Greek sovereign debt restructuring. As a result, the Euro area policy makers put in place a number of measures including those aimed at ensuring that the resolution of future sovereign debt crises would not be so costly to the Euro system: CACs were a key element of this policy response (Hofmann (2014)).

The Euro CAC initiative provides for the mandatory inclusion of standardized and identical CACs in all new Eurozone sovereign bonds issued after January 1, 2013 with maturities greater than one year. The CACs apply to all new issues, irrespective of the governing law. The provisions describe the majorities required to modify the payment terms for a single series of bonds (66.67 percent) as well as a cross-series modification (75 percent across all the series).[4] In essence, the Euro CAC initiative engineered, in one blow, what was likely the single biggest change to sovereign bond contract terms ever (Gelpern and Gulati (2013)).[5]

The Euro CAC initiative was intended to ensure private sector involvement in future sovereign restructurings by improving creditors' coordination, and reduce the problem of holdout creditor litigation that frequently impacts sovereign restructurings (Gelpern and Gulati (2013)). However, it was unclear how the provision would play out given that the introduction of CACs could potentially worsen

[4] See *2012 Linklaters, "EU publishes mandatory Collective Action Clause for use in eurozone sovereign bonds from 1 January 2013"*, May.

[5] In shaping the Euro CACs, Euro area policy makers borrowed from the US Treasury department initiative in the early 2000s, which focused on emerging market countries issuing bonds to foreign investors under New York law. The Euro area version of the initiative, however, was more ambitious in three ways. The size was larger (it applied to a multi trillion dollar market as compared to one that was a few hundred billion), the scope was wider (applied via the local law of every Euro member nation as opposed to a single one, New York), and the CAC provisions in question were more powerful (applying in an aggregated fashion across a full set of a nation's bonds, as opposed to on a bond by bond basis).

the "willingness-to-pay" problem of sovereigns. At the margin, after all, making it easier for a sovereign to restructure its debt might also make it more tempting to do so in a strategic manner even when the sovereign crisis is not acute enough to justify such action.[6]

To test the impact of Euro CACs on bond yields, we first develop a simple model to illustrate the main ideas and predictions arising from the introduction of CACs. The framework borrows two key features from Bolton and Jeanne (2009). First, the sovereign is assumed to be subject to the classic "willingness to pay" problem as in Eaton and Gersovitz (1981) so that it cannot credibly commit to repay creditors. Second, there can be selective default in that the sovereign can default selectively on creditors holding different types of bond contracts. This second feature helps us understand the Euro area context where there is a coexistence of CAC and no-CAC bonds.

B. The model

We develop a simple two-period (T=1,2) framework where a sovereign has one outstanding unit of no-CAC bonds and one of CAC bonds. Both bonds have to be repaid in period 2, but differ in terms of investors' protection, as we explain below. The sovereign uses the funds raised to invest in a productive investment returning a stochastic output y at date 2, which is distributed according to the probability distribution function $f(y)$ over $[\underline{y},\overline{y}]$. The government maximizes output net of the repayments to bondholders.

Lenders are risk neutral and require the same expected return, which is normalized to zero. There is perfect competition among lenders. so that the sovereign can extract all the surplus. We denote by D_i the promised repayment on debt issued at date 1, where i = N, C indicates no-CAC and CAC bonds.

Debt is repaid at date 2 when the output realizes. The sovereign debt market is perfectly competitive and the equilibrium riskless interest rate is normalized to zero, so that creditors make zero returns in expectation. The promise to repay $D_N + D_C$ is credible only if it is in the sovereign's interest to repay its debt obligations ex post. As typical in the sovereign debt literature, we assume that the sovereign repays only as a way to avoid the cost of default. This is modelled as being a proportional

[6] As of this writing, in late 2018, policy makers in the Euro area are actively debating whether to enhance the effectiveness of the existing CACs in Euro area sovereign bonds, so as to further reduce the likelihood of holdout problems in future debt restructurings. Some EU members object that this reform, on the grounds that making it easier for sovereings to restructure, will raise their cost of borrowing at an inopportune moment (Zettelmeyer (2018)). For example, in June 2018, the Director General of Italy's Treasury Department called the proposal for enhanced CACs a "bombshell in the making", arguing that "Italy is in a very fragile situation due to a very high public debt and these intiatives . . . produce enormous risk" (Guarascio (2018)).

output loss $\gamma_i y$ with i=N,C, and can be interpreted as a sanction imposed by creditors on the defaulting sovereign (see, e.g., Bolton and Jeanne (2009)).

Importantly, we consider that the default cost depends on the "size" of the default. As the sovereign borrows from different creditors, it can default selectively on the CAC and no-CAC bonds. As the no-CAC bonds require unanimity of consensus for any payment modification, they are more difficult to restructure than the CAC bonds requiring only a minimum vote threshold. For simplicity, we then consider that CAC bonds can be renegotiated at no cost, while the no-CAC bonds are not renegotiable so that no-CAC lenders obtain either *0* or the promised repayment. The sovereign has therefore the following options at date 2: [7]

a) *Full default*: pay 0 to both CAC or no-CAC lenders and incur the output loss $(\gamma_N+\gamma_C)y$ so to obtain $(1 - (\gamma_N + \gamma_C))y$;
b) *Partial default*: restructure CAC bonds in exchange for a return η_P, while pay 0 to no-CAC lenders, thus incurring the default costs $\gamma_N y$ and obtaining $(1-\gamma_N)y - \eta_P$.
c) *Strategic default*: restructure CAC bonds for a return η_S and repay the no-CAC lenders the promised repayment D_N. In this case, there are no output losses and the sovereign obtains $y-\eta_S-D_N$.
d) *Full repayment*: repay both types of lenders the promised repayment D_i and obtain $y- D_N - D_C$.

The table below summarizes the payoffs of the different players.

[7] One may ask whether these assumptions – typical in the analysis of the foreign law context – are justified here given that a sovereign has control of the local law and can alter it for any bonds where there are too many holdouts. This is what is referred to as the "local law advantage" in the literature and was crucial to the Greek restructuring in 2012 and the Barbados restructuring in 2018 (Buchheit and Gulati (2018)). The key point is that this local law advantage has significant limitations on it, as a function of litigation costs and circumstances when it can be justfified as in the case of the Greek restructuring of 2012 (Grund (2017)). Thus, for purposes of the model, we disregard the possibility of using the local law advantage (which would apply to both CAC and no-CAC bonds similarly). Rather, we focus on the fact that the likelihood of the sovereign behaving strategically will depend on the size of the parameter γ_i representing the constraints imposed by the domestic legal system.

	Sovereign	CAC lenders	no-CAC lenders
No default	y- $D_N - D_C$	D_C	D_N
Strategic default	$y-\eta_S - D_N$	η_S	D_N
Partial default	$(1 - \gamma_N)y - \eta_P$	η_P	0
Full default	$(1 - (\gamma_N + \gamma_C))y$	0	0

The table highlights the trade-off between CAC and no-CAC bonds. CAC bonds protect lenders in partial default, but they also expose them to the possibility of being restructured in a strategic default. By contrast, no-CAC bonds do not protect investors in partial default, but are not subject to restructuring in a strategic default.

A. Repayment game

The sovereign chooses the action at date 2 that maximizes its returns. Thus, the sovereign prefers partial default over full default if

$$(1-\gamma_N)y - \eta_P, \geq \big(1-(\gamma_N+\gamma_C)\big)y$$

that is for

$$\eta_P \leq \gamma_C y.$$

For simplicity, we consider that creditors obtain the surplus in the renegotiation phase and can thus set

$$\eta_P = \gamma_C y\,. \tag{1}$$

Similarly, the sovereign prefers strategic default over partial (or full) default if

$$y - \eta_S - D_N \geq (1-\gamma_N)y - \eta_P = \big(1-(\gamma_N+\gamma_C)\big)y,$$

that is for

$$\eta_S \leq \gamma_N y + \eta_P - D_N. \tag{2}$$

Substituting η_P from (1) implies that strategic default is possible if

$$\gamma_N y + \gamma_C y \geq D_N$$

or if

$$y \geq \frac{D_N}{y_N + \gamma_C}.$$

Using again η_P as in (1) and solving (2) with equality considering again that creditors have the full bargaining power, we then obtain

$$\eta_S = (\gamma_N + \gamma_C)y - D_N. \quad (3)$$

Finally, the sovereign prefers full repayment over strategic (partial or full) default if

$$y - D_N - D_C \geq y - \eta_S - D_N$$

Substituting then η_S as in (2), full repayment is then preferred for

$$y \geq \frac{D_N + D_C}{\gamma_N + \gamma_C}.$$

We then obtain the following result characterizing the default ex post.

Proposition 1: The sovereign's debt repayment strategy is as follows:

a. Full repayment: if $y \geq \frac{D_N+D_C}{\gamma_N+\gamma_C}$, the sovereign fully repays both types of debt.
b. Strategic default: if $\frac{D_N}{\gamma_N+\gamma_C} \leq y < \frac{D_N+D_C}{\gamma_N+\gamma_C}$, the sovereign fully repays the no-CAC bonds, while it restructures the CAC bonds in exchange for η_S.
c. Partial default: if $y < \frac{D_N}{\gamma_N+\gamma_C}$, the sovereign defaults on the no-CAC bonds, while it restructures the CAC bonds in exchange for η_P.

Proof: See the discussion above.

This proposition highlights the importance of different contractual clauses for lenders' repayment. For low levels of output, the CAC creditors are more protected than no-CAC bondholders as the latter cannot coordinate on a restructuring. For intermediate values of output though, the possibility for the sovereign to default strategically and restructure the CAC bonds hurts the CAC creditors relative to the no-CAC creditors that are instead repaid fully. Creditors anticipate the different treatment at date 2 when pricing their debt at date 1. It follows that the difference between the promised repayments D_N and D_C on no-CAC and CAC bonds will depend on the likelihood of strategic default versus partial default. We turn to this next.

B. Creditors' repayments

We can now turn to date 1 and analyze debt pricing. As the sovereign debt market is competitive at date 1, the sovereign extracts all surplus and sets the promised repayments on both bonds just to satisfy

creditors' participation constraint. From Proposition 1, CAC creditors' participation constraint is given by

$$\int_{\underline{y}}^{\frac{D_N}{\gamma_N+\gamma_C}} \eta_P f(y)dy + \int_{\frac{D_N}{\gamma_N+\gamma_C}}^{\frac{D_N+D_C}{\gamma_N+\gamma_C}} \eta_S f(y)dy + \int_{\frac{D_N+D_C}{\gamma_N+\gamma_C}}^{\overline{y}} D_C f(y)dy \geq 1.$$

Substituting η_P and η_S from (1) and (2) above, the expression simplifies to

$$\int_{\underline{y}}^{\frac{D_N}{\gamma_N+\gamma_C}} \gamma_C y f(y)dy + \int_{\frac{D_N}{\gamma_N+\gamma_C}}^{\frac{D_N+D_C}{\gamma_N+\gamma_C}} ((\gamma_N+\gamma_C)y - D_N)f(y)dy + \int_{\frac{D_N+D_C}{\gamma_N+\gamma_C}}^{\overline{y}} D_C f(y)dy \geq 1, \quad (4)$$

where the terms represent, in order, the payoff in the case of partial default, strategic default and full repayment.

Similarly, the participation constraint of no-CAC creditors is given by

$$\int_{\frac{D_N}{\gamma_N+\gamma_C}}^{\overline{y}} D_N f(y)dy \geq 1. \quad (5)$$

since they obtain nothing for $y <. \frac{D_N}{\gamma_N+\gamma_C}$ while they are fully repaid otherwise.

It is immediate to see from (4) and (5) that the difference in the promised repayments (and thus in yields) between D_N and D_C can be either positive or negative depending on the relative importance of the regions of partial and strategic default. In particular, the larger the partial default region and the lower the one of strategic default, the more D_C will be likely smaller than D_N. The relative importance of the two regions depends in turn on the probability distribution $f(y)$ and the size of the default costs as represented by the parameters γ_N and γ_C. We have the following result.

Proposition 2: The difference between the promised repayments$|D_N - D_C|$ is larger i) the greater is the mass of the distribution probability *f(y)* in the interval $[\underline{y}, \frac{D_N}{\gamma_N+\gamma_C}]$ relative to the mass in the interval $[\frac{D_N}{\gamma_N+\gamma_C}, \frac{D_N+D_C}{\gamma_N+\gamma_C}]$; ii) the larger are the parameters γ_N and γ_C as, for given *f(y)*, the size of the strategic default region decreases with them: $\partial \left[\frac{D_N+D_C}{\gamma_N+\gamma_C} - \frac{D_N}{\gamma_N+\gamma_C}\right] / \partial \gamma_i = - \frac{D_C}{(\gamma_N+\gamma_C)^2}$.

C. Empirical predictions

We can use Proposition 2 to generate two main empirical predictions. First, the shape of the distribution f(y) can be approximated by the rating of a country. In particular, worse ratings correspond to more skewed left distributions than better ratings. Second, the parameter γ_C can be seen as a

measure of the quality of law of a country. As explained above, the parameter γ_i represents the proportion of output lost in a default. This in turn can be interpreted as a sanction imposed by creditors. Thus, it is plausible to consider it an increasing function of the quality of the legal system as better laws and courts will provide better protection to investors against expropriation by the state. In line with these arguments, we expect the spread between CAC and no-CAC bonds will vary across Euro area countries as follows:

1) the yield differential between the no-CAC and the CAC bonds as represented by the difference $|D_N - D_C|$ is decreasing in the sovereign's rating;
2) the yield differential between the no-CAC and the CAC bonds as represented by the difference $|D_N - D_C|$ is increasing in the quality of law of the sovereign.

II. Dataset Description

In our analyses we will make use of two samples of bonds: bonds with CAC provisions issued after January 1, 2013 ("CAC bonds"), and bonds without CAC provisions issued before January 1, 2013 that have similar characteristics to CAC bonds ("Matched no-CAC bonds"). Our primary source of information is Bloomberg.

CAC bonds are selected according to the following criteria: issued by national governments belonging to the Eurozone as of January 2013 (Austria, Belgium, Cyprus, Estonia, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Malta, the Netherlands, Portugal, Slovakia, Slovenia and Spain); denominated in Euro; with issuance between January 1, 2013 and June 30, 2014; with maturity (at issuance) between 1 and 30 years; with strictly positive amount issued; being either zero coupon or having a fixed coupon; noncallable, nonputtable, nonsinking fund, nonconvertible and not inflation linked. At this stage we select 106 bonds issued by 15 Eurozone countries.[8] Despite the inclusion of CACs in bonds issued after January 1, 2013 is mandatory, we check that bonds are flagged by Bloomberg as including CACs. For cautioness, we then drop four bonds (three issued by Belgium and one from Malta) for which this data field is missing. We finally resort to Bloomberg, Dealogic and Thomson One to identify the governing law of these bonds, and supplement information from these

[8] There are no bond issuances that meet our criteria for Estonia, while Greece issued only short term bonds, i.e., with maturities less than a year, during our sample period.

sources with hand-collected data. We are able to find the governing law of 93 bonds issued by 14 Eurozone countries,[9] out of which we identify 89 as domestic-law bonds.

To build the sample of matched no-CAC bonds we first identify in Bloomberg the pool of bonds using criteria similar to the ones described above, with the sole exception that we now consider bonds issued before January 1, 2013 that mature after that date. We then retrieve the governing law of these bonds using the three datasets mentioned above. Again we check that bonds issued under local law are not flagged by Bloomberg as having CAC provisions. We perform a matching (without replacement) for each CAC bond with one bond in this pool conditioning on same issuer and same currency, and select the bond with the closest maturity date to that of the CAC bond we consider. For example, we match the 10YR Euro-denominated 1.75 percent German CAC bond issued on January 31, 2014 (with an International Securities Identification Number equal to DE0001102333, maturity February 15, 2024) with the 30YR Euro-denominated 6.25 percent German no-CAC bond issued on January 4, 1994 (ISIN DE0001134922, maturity January 4, 2024). Our matching procedure enables us to form 83 pairs of CAC and matched no-CAC bonds issued by 13 countries.[10]

Table 1 provides the country breakdown at each stage of our data construction procedure. The country split for CAC issuances is in line with that observed for Euro-denominated long-term bonds in previous periods,[11] where Belgium, France, Italy and Spain account for more than 50 percent of issuances. In economic terms, the largest issuers are France, Germany, Italy and Spain, which represent about 80 percent of the total outstanding amount of CAC bonds by the end of 2014. The country breakdown we uncover using CAC bonds' outstanding amount (see the last column in Table 1) is in line with that one obtains using central government long-term debt securities during the last quarter of 2014. [12]

Figure 1 displays the issuance activity (amount at issuance as well as the number of issuances) of CAC bonds between January 2013 and June 2014. Within six months from the inception of the Euro

[9] We drop bonds issued by Malta because we cannot retrieve their governing law.
[10] The matching procedure drops all CAC bonds issued by Cyprus since before 2013 Cyprus issued bonds under English law only. We further discard the 15YR 2.25 percent bond issued by Luxemburg on March 13, 2013 (ISIN LU0905090048) because the only bond we could match it with has a very different maturity (ISIN XS0506445963, maturity date May 18, 2020).
[11] We have identified new issuances of Euro-denominated bonds with zero or fixed coupon and maturity at issuance between 1 and 30 years between January 1, 2009 and June 30, 2010, and get country breakdowns that are similar to those documented in Table 1 for our CAC bonds.
[12] The matching procedure drops all CAC bonds issued by Cyprus since before 2013 Cyprus issued bonds under English law only. We further discard the 15YR 2.25 percent bond issued by Luxemburg on March 13, 2013 (ISIN LU0905090048) because the only bond we could match it with has a very different maturity (ISIN XS0506445963, maturity date May 18, 2020).

CAC initiative, all countries but Luxembourg had issued at least one bond with CACs. Figure 2 plots the time-series of the amount outstanding (sum of amount at issuance and reopenings) of CAC bonds,[13] both in absolute terms and relative to the overall amount of long-term government debt. Figure 2 reveals that by the end of June 2014 about 13 percent of long-term bonds included the new Euro CAC provision.[14] The joint message of Figures 1 and 2 is that CAC bonds have gained importance, over time, in the context of Eurozone sovereign debt markets.

For these CAC bonds we collect from Bloomberg daily mid-yields, prices (mid, ask and bid), amount outstanding and volume,[15] between January 1, 2013 (or the issue date, for bonds issued later than January 1, 2013) and December 30, 2014 (or the maturity date, for bonds maturing before December 30, 2014). For the sample of matched no-CAC bonds we collect the same variables between January 1, 2013 and December 30, 2014 (or the maturity date). We compute Macaulay duration, convexity, and percentage bid-ask spreads from daily prices. We create the variable $Dur_{i,c,t} = Macaulay\ Dur_{i,c,t} - 0.5 \times \frac{Conv_{i,c,t}}{100}$ which corrects Macaulay duration by bond convexity.[16] To reduce the measurement error that may contaminate daily data, we carry out our analyses at the weekly level and derive weekly variables as simple averages of daily values, dropping weeks with negative or zero yields.

Table 2 reports descriptive statistics of bond-level variables for the CAC and the matched no-CAC samples. Here, we consider only those weeks where both the CAC bond and the matched no-CAC bond have available bond-level information. To illustrate, we include the 30YR Euro-denominated 6.25 percent German no-CAC bond issued on January 4, 1994 from the fifth week of 2014 onwards. This ensures that our panel dataset has the same number of weekly observations for CAC and matched no-CAC bonds. On average, CAC bonds have higher duration, smaller amount outstanding and turnover, and lower bid-ask spreads, while their maturities do not differ from those of matched no-CAC bonds. Figure 3 plots the histogram of the absolute distance (in months) between maturities in the two

[13] After issuing a new bond, governments can raise additional debt by reopening already existing securities. Reopenings are indeed quite common: during our sample period, 70 (out of 83) bonds have been reopened and, at the end of June 2014, they represent about 60 percent of the aggregate outstanding amount of CAC bonds.

[14] For each country, we define long-term government debt as the sum of general government long-term residual maturities (over 1 year) and short-term residual maturities (up to 1 year), in all currencies (source: *ECB Statistical Data Warehouse*).

[15] Bloomberg contains volume data separately for each exchange where a bond is listed. On average, bonds in our sample are listed on four exchanges, with considerable variation across countries – mean values range from 1.33 exchanges for Slovenian bonds to 9.1 exchanges for German bonds. Turnover is defined as total traded volume (i.e., aggregated across all exchanges) scaled by amount outstanding.

[16] In principle, we could include convexity as an additional measure of bond risk. However, in our sample, Macaulay duration and convexity are highly collinear (the linear correlation equals 0.934). We therefore opt for an alternative measure of bond price risk – which we label simply as "duration". Our results are unchanged when using Macaulay duration alone.

samples. For 50 bond pairs (representing about 60 percent of our sample) the difference in maturities is less than 6 months, and for 69 pairs (representing more than 80 percent of our sample) it is less than one year.

III. CAC Provisions and Yield Differentials

We start by investigating the impact of CAC provisions on bond yields. To this end, we compare the yields of CAC bonds with those of matched no-CAC bonds. Our empirical strategy is to estimate the following random-effects model:

$$y_{i,c,t} = \alpha + \beta CAC_i + \gamma X_{i,c,t} + \theta_i + \varepsilon_{i,c,t} \quad (1)$$

where θ_i is a bond-level random component, $y_{i,c,t}$ is the log of the mid-yield (in percent) for bond i (issued by country c) during week t,[17] CAC_i is our main variable of interest (an indicator equal to one for a CAC bond and zero for a matched no-CAC bond), and $X_{i,c,t}$ is a vector of control variables. The vector $X_{i,c,t}$ includes time (i.e., week) fixed effects that capture co-movement in Eurozone yields, and bond- as well as country-specific variables (definitions of the explanatory variables are collected in Table A1 in Appendix).

We map country Standard & Poor's long-term issuer credit ratings (observed on Fridays) to a numeric scale and proxy country creditworthiness by means of $Rating_{c,t}$. Higher values of $Rating_{c,t}$ indicate worse credit ratings: during our sample period, this variable ranges from 1 (AAA rating) to 12 (BB rating). Although we have matched CAC to no-CAC bonds along a number of dimensions (i.e., issuer, currency, law, and residual maturity), other bond-level characteristics impinge on risk and, in turn, on yields. As a proxy for bond interest rate risk we include duration ($Dur_{i,c,t}$), which is affected, among others, by the coupon structure (rate and frequency of payment). Moreover, since by construction matched no-CAC bonds are off-the-run while CAC bonds are on-the-run,[18] we control for liquidity risk by means of bond $Size_{i,c,t}$, i.e., the log of outstanding amount (in Euro mln), bid-ask spread (in percent), $BAS_{i,c,t}$, and turnover (exchange-traded volume scaled by amount outstanding). Note that bond size is usually time-varying, at the bond level, due to reopenings.

[17] We take the logarithm of the bond yields to mitigate the effect of potential outliers. However, results in our main analysis are unaffected if we use yields (in level).

[18] The positive yield differential between off- and on-the-run treasuries is well documented for the US market (e.g., Warga (1992); and Pasquariello and Vega (2009)), while we are unaware of similar studies for European sovereigns.

The research question we are after motivates our choice to use unit-specific (i.e. bond) random effects, as opposed to fixed effects: our variable of interest – the inclusion of CAC provisions – is multicollinear with bond fixed effects. Bae and Vidhan (2009) offer similar considerations when examining the relation between legal protection and bank loan characteristics in 48 countries: since their variables of interest – creditor and property rights indexes – show little within-unit (i.e. country) variation, they opt for random effects instead of fixed effects which "soak up some of the explanatory power of these slowly changing variables" (Bae and Vidhan (2009), p. 839). Random effects therefore emerge as a (partial) remedy to omitted variables, at least those that are uncorrelated with our covariates. As an alternative to the random-effects estimation, we use pooled OLS after replacing the bond random components θ_i in specification (1) with bond-*pair* fixed effects. Also in this case we can come up with an estimate for the coefficient of interest, β, which is robust to omitted variables – although at a higher level of aggregation – correlated with our covariates. We will return to the issue of bond-level omitted variables in Section V as well.

Table 3 reports random-effects (RE) and pooled OLS estimation results for several specifications. Standard errors are adjusted for clustering at the level of the matched bonds in the sample.[19] Columns 1 and 3 in Table 3 refer to the baseline specification (1) and highlight that yields increase with bond-level interest rate risk, while liquidity risk measures are overall insignificant. This lack of significance is not surprising in light of the mixed evidence on the role of liquidity for Euro area government bonds: Favero, Pagano and von Thadden (2010) for example find that liquidity differentials are priced only for a subset of EMU countries, while Beber, Brandt and Kavajecz (2009) show that liquidity matters only in times of economic distress. Random-effects estimation results futher establish that bond yields are inversely related to the issuer creditworthiness, while country ratings are not significant in column 3 – this happens because ratings show relatively little within-country variation during our sample period and bond-pair fixed effects absorb time-invariant country characteristics.

Turning to our main variable of interest, CAC provisions negatively affect bond yields: our estimates indicate that yields on CAC bonds are, on average, about 8-10 percent lower than those of matched no-CAC bonds, i.e., $8.06 \text{ percent} = 1 - \exp(-0.084)$ and $10.6 \text{ percent} = 1 - \exp(-0.112)$ and; or equivalently they are lower by 13-17 bps.

[19] Clustering at the country level (which spans bonds level clustering, see e.g., Cameron, Gelbach and Miller (2011)) leaves our main findings unaffected.

The baseline specification is pooled across all issuers, so that all our control variables (as well as the constant term) are estimated across countries. Thus, one potential concern is whether cross-country heterogeneity affects our findings. This concern may apply both to bond-specific characteristics as well as variables that are common to all Eurozone countries – captured by the week fixed effects. For instance, there is evidence that bond-level liquidity risk differs across the maturity spectrum (Beber, Brandt and Kavajecz (2009)). Moreover, the empirical evidence on the ECB (unconventional) monetary policy is suggestive that yields on sovereign bonds issued by different countries react differently to these interventions, while the response of the yield curve to ECB (conventional) monetary policy is quite homogeneous across countries.[20]

To address these concerns, we consider a saturated model that includes the interactions between country fixed effects and bond-level variables (52=13×4 interactions) as well as the interactions between country and time fixed effects (1,339=13×103 interactions).[21] This saturated model, in essence, maintains only one panel restriction, i.e., the CAC indicator. Columns 2 and 4 in Table 3 report regression results for the saturated model. Yields continue to be negatively associated with CAC provisions, although both the economic magnitude and the statistical significance of this effect are lower than those documented for the baseline specification: point estimates in column 2 (resp. 4) would translate into a 8 bps (resp., 15 bps) yield wedge between CAC and matched no-CAC bonds.

The data-pooling used in panel estimation may mask a time-varying response of bond yields to CAC provisions. To address this issue, we perform OLS cross-sectional regressions for each week. The equation estimated at each time t is the same as in specification (1), dropping the bond random components θ_i and the time fixed effects. We start our analysis from the last week of February 2013 because we have at least 30 observations (15 CAC and 15 matched no-CAC bonds) from then onwards. The adjusted R-squared ranges between 0.62 and 0.94, with an average value of 0.79. The point estimates for the coefficient on the CAC indicator are plotted in Figure 4 (solid blue line) together with their 99 percent confidence intervals (shaded grey area). As the figure reveals, we can exclude that yields between CAC and no-CAC bonds are identical for a substantial number of cross-sections (67 out

[20] The implementation of the ECB Securities Markets Programme (SMP) has successfully driven down yields of the countries under the programme, with reductions ranging from -1 to -2bps (Italy) up to -17 to -21bps (Greece) per €1 bln of bond purchases (Eser and Schwaab (2016); Ghysels, Idier, Manganelli and Vergote (2016)). Altavilla, Giannone and Lenza (2016) document that the ECB Outright Monetary Transactions (OMT) announcements lowered bond yields in Italy and Spain while leaving yields on French and German bonds largely unaffected. The same authors find that a tightening in the stance of euro-area-wide (conventional) monetary policy exerts fairly homogeneous effects on yield curves across countries.

[21] We do not include country fixed effects as well as their interactions with country risk as these are collinear with the (country × week) interactions.

of 96 weeks). Overall, the yield differential between CAC and matched no-CAC bonds is persistently negative and statistically significant throughout the sample period.

IV. Country heterogeneity

We now shed light on how the yield differential varies across countries by interacting the CAC indicator in specification (1) with country fixed effects. Panel A in Table 4 reports random-effects estimation results (see column 1). This specification produces, for each country, estimates for average (log-)yields on CAC and matched no-CAC bonds – after controlling for country- and bond-level covariates and the time fixed effects. Instead of reporting these coefficients (26 in total), we show in Panel B, for each country indicated by ISO-Alpha 2 country code, the difference between these coefficients – what we label as the "net impact of CAC provisions" – together with its standard error (in brackets), and the percentage of bond-week observations in a given country (in square brackets). According to Panel B, there is no country where CAC bonds trade at significantly higher yields than matched no-CAC bonds. In light of the model, the result suggests that there is a low likelihood of strategic in our countries of interest relative to partial default, so that no-CAC bonds have higher yields. For a subset of countries, CAC provisions negatively affect bond yields in six countries that represent about 40% of the sample: estimates indicate that yields on CAC bonds are, on average, about 8 percent (Italy) to 22 percent (Portugal) lower than those of matched no-CAC bonds. We now turn to disentangle the effect of CAC provisions according to the two variables that the model highlights as important drivers of the CAC and no-CAC yields (see Section I.B): issuer creditworthiness and quality of the legal system.

A. CAC Provisions and Creditworthiness

First, we investigate how the CAC vs. no-CAC yield differential changes across the credit ratings spectrum.[22] To this end we add to specification (1) the interaction between the CAC indicator and $Rating_{c,t}$, and estimate:

$$y_{i,c,t} = \alpha + \beta_0 CAC_i + \beta_1 CAC_i \times Rating_{c,t} + \gamma X_{i,c,t} + \theta_i + \varepsilon_{i,c,t} \qquad (2)$$

[22] The existing empirical literature (e.g., Bardozzetti and Dottori (2014) and Bradley and Gulati (2014), and references cited therein), has dealt with the effect of CAC provisions in countries with different creditworhtiness, however reaching mixed results..

It is worth mentioning that the coefficients on the constitutive terms CAC_i and $Rating_{c,t}$ in the multiplicative model (2) cannot be interpreted as unconditional or average effects. We therefore follow Brambor, Clark and Golder (2006) in making inference from our interaction model.[23] What we are interested in is the net impact of CAC provisions, which, according to specification (2) is

$$\beta_0 + \beta_1 Rating_{c,t}$$

The coefficient β_0 would therefore be informative of the marginal effect of CACs for the unique case when in which $Rating_{c,t} = 0$ – a case we never observe since the we code the best rating, AAA, as $Rating_{c,t} = 1$ and $Rating_{c,t}$ increases with worse credit quality.[24] What is more, it is perfectly possible for the marginal effect of CACs to be significant for a meaningful range of country ratings *even if* the coefficient β_1 is insignificant (see Brambor, Clark and Golder (2006), p. 74). We therefore complement regression results for specification (2) in Table 4 (see Panel A, second column) with the marginal effect of CACs across the country ratings spectrum we observe in our sample (see Panel B). Similar to our findings in Table 3, yields increase with interest rate risk, and those of matched no-CAC bonds get larger with worse credit ratings. The net impact of CACs is always negative, and its magnitude as well as statistical significance increases as issuer creditworthiness deteriorates: the marginal effect of CAC provisions is significant at the 1% level for countries with AA rating or worse (about 75% of bond-week observations), where it ranges from 6.5% (rating AA) to 11.5% (rating BB).

Overall, these findings support the prediction that the yield differential between CAC and no-CAC bonds is larger for issuers with worse credit quality.

B. CAC Provisions and Quality of Law

We now analyze how the yield differential associated with CAC provisions depends on the strength of the legal system. We first screen the empirical literature on legal protection and financial outcomes (most notably, Bae and Vidhan (2009) and Karolyi (2015), and the references therein) to identify the proxies for a country's quality of law. We select six indicators: the formalism index (Djankov, La Porta, Lopez-de-Silanes and Shleifer (2003); abbreviated as *DLLS*), the judicial efficiency index (La

[23] Finance applications include Georgarakos and Pasini (2011) for the effect of trust and sociability on stock ownership and Carrieri, Chaieb and Errunza (2013) for the effect of openness and implicit barriers on globalization.

[24] Similarly, the coefficient on country ratings would be revealing of the impact of issuer creditworthiness on (log-)yields of matched no-CAC bonds *only*.

Porta, Lopez-de-Silanes, Shleifer and Vishny (1998); *LLSV(EJ)*), the property rights index (Heritage Foundation; *Heritage*), the law and order index (PRS Group/ICRG Political Risk Rating; *PRS*), and two rule of law indexes (*LLSV(RL)* and World Bank Worldwide Governance Indicator, abbreviated as *World Ban*k). These indicators are broadly related to the quality of law, both in terms of the law on-the-books and law enforcement.[25] In light of the model of Section I.B, we view these as proxies for the parameter γ – larger values for γ are associated with better legal systems. In order to empirically investigate the effect of a country's quality of law on bond yields we add to specification (1) $Quality\ of\ law_{c,t}$ and its interaction with the CAC indicator, and estimate:

$$y_{i,c,t} = \alpha + \beta_0 CAC_i + \beta_1 CAC_i \times Quality\ of\ law_{c,t} + \gamma X_{i,c,t} + \theta_i + \varepsilon_{i,c,t} \qquad (3)$$

where the vector of covariates $X_{i,c,t}$ includes $Quality\ of\ law_{c,t}$ on top of all the variables used in specification (1) – week fixed effects, country ratings, and bond-level variables. Regressions results are reported in columns 3-8 in Table 4-Panel A, separately for each quality of law measure. We confirm previous findings that bond yields are positively associated with duration – our proxy for interest rate risk –, and, overall, negatively associated with the issuer creditworthiness. Columns 3-5 further offer some evidence that bond yields decrease with bond size, consistent with the idea that liquidity risk is priced.[26] According to specification (3), the net impact of CAC provisions is given by:

$$\beta_0 + \beta_1 Quality\ of\ law_{c,t}$$

[25] Some of these indicators – DLLS, LLSV(EJ) and LLSV(RL) – are, by construction, purely cross-sectional since they are observed only once, while the others are, at least in principle, time-varying. During our sample period, however, only the World Bank Rule of Law index shows some (little) variation, at the country level, over time. With the sole exception of DLLS, which ranges from good to bad, all indicators assign larger values to countries with better quality of law. DLLS and the LLSV indicators are not available for some countries in our sample – see Panel B in Table A1 for further details.

[26] As noted in Subsection IV.A, the coefficient β_0 is informative of the marginal effect of CACs in a country with $Quality\ of\ law_{c,t} = 0$, a case we never observe in our sample. For the proxies in columns 4-7 a value of 0 would indicate a with a country with extremely low quality of law, which is not observed even in the entire sample of countries for which these proxies are available: the lowest value for LLSV(EJ) is 2.5 (Indonesia), for LLSV(RL) is 1.9 (Sri Lanka), for PRS is 0.83 (Somalia), and for Heritage is 0.5 (North Korea, Turkmenistan and Venezuela). The rule of law index form the World Bank takes a value very close to zero for Montenegro (0.007), and reaches its lowest value at -2.45 (Somalia). On the contrary, since DLLS ranges from good to bad a value of 0 would indicate a country with extremely high quality of law – according to Djankov, La Porta, Lopez-de-Silanes and Shleifer (2003) the best country is Hong Kong with a formalism index of 0.73.

which we report in Table 4-Panel B for the values of the quality of law indicator(s) that we observe in our sample.[27] Number is square brackets refer to the percentage of the sample (bond-week observations) that falls into each value. According to the DLLS formalism index, these marginal effects are significantly negative at the 1% level for more than 85% of our sample – with the sole exception of the effect associated to the largest value of 5.25 (Spain) which is insignificant – and increase from left to right. Since DLLS sorts countries from good to bad, this evidence is consistent with a negative yield differential associated to CAC provisions that widens with the quality of the legal system. Different from DLLS, the other five indicators assign larger values to better quality of law countries. The marginal effects in Panel B associated to each of these indicators are always negative and decrease from left to right. These marginal effects are all significant at the 1% level, with the exception of countries with relatively worse quality of law that are significant at the 5% level.

In sum, the evidence on the interplay between CAC provisions and the quality of law is consistent with the idea that the incentives to strategically default are weaker in countries with better legal systems.

V. Further results: Falsification exercise

One potential concern with the evidence cumulated so far is omitted variables at the bond-level that are correlated with both CAC provisions and bond yields. To check for the possibility that the relationship between CACs and yields is spurious, we conduct a falsification exercise assuming (wrongly) that the Euro CAC initiative took place on January 1, 2011. Making use of the same filtering criteria detailed in Section II, we identify a placebo sample consisting of 73 bonds issued between January 1, 2011 and June 30, 2012 ("pseudo CAC bonds"), which we match with closest-maturity bonds issued prior to January 1, 2011 ("pseudo no-CAC bonds").[28] We then replicate our analyses using this placebo sample. In Table 5 we report random-effects estimation results for: 1) our baseline specification (1) (see column 1), and, 2) the saturated model that retains the pseudo CAC indicator as the sole panel restriction while interacting all other variables with country fixed effects (see column 2). Column 1 corroborates the evidence that bond yields are positively associated with bond-level interest rate risk and country credit risk (see Table 3-Column 1). Additionally, it suggests that liquidity risk is priced in bond yields: larger bonds and those with smaller bid-ask spreads have lower yields, while it is

[27] For the World Bank rule of law index we report marginal effects evaluated at the 2013 values.

[28] The matching quality (in terms of residual maturities) is fairly similar to the one of CAC and matched no-CAC bonds: about 60% of bond pairs (42 out of 73) have residual maturities within 6 months, and about 75% (56 out of 73) within one year. Residual maturities are not statistically different between the two groups of bonds.

worth recalling that these variables were overall insignificant so far. These findings are contradictory only at a first sight: they are indeed consistent with the evidence in Beber, Brandt and Kavajecz (2009) that liquidity matters only during times of heightened uncertainty – and there is little doubt that sovereign debt markets were in turmoil during the years 2011-12. Importantly, neither column in Table 5 certifies significant changes in yields associated with the pseudo CAC indicator. We then perform OLS cross-sectional regressions of specification (1) dropping the bond random components θ_i and the time fixed effects for each week from April 4, 2011 – the first week for which we have 15 bond pairs – to December 28, 2012. Figure 5 depicts the point estimates for the coefficient on the pseudo CAC indicator (solid blue line) together with their 99 percent confidence intervals (shaded grey area). As the figure reveals, we never reject the hypothesis that yields are identical between pseudo CAC bonds and their matched counterparts. Finally, we make use of cross-country variation in creditworthiness and the quality of the legal system to estimate specifications (2) and (3) after replacing CAC_i with the pseudo CAC indicator. Random-effects estimation results are reported in Panel A of Table 6, while Panel B shows the marginal effects of pseudo CAC provisions. Contrary to our findings based on the sample of CAC and matched no-CAC bonds (see Table 4), we fail, overall, to detect significant differences in yields between the two groups of bonds both across the ratings spectrum and the deck of the quality of the legal system measures. We conclude that systematic differences between recently issued bonds and older bonds are not confounding the reduction in bond yields associated with CAC provisions that we have documented in Sections III and IV.

VI. Conclusion

This paper exploits the Euro Collective Action Clause (CAC) initiative of 2013 to obtain results on a basic question in law and finance: are the non-financial contract terms of a bond priced? We ask that question in an arena where it has not been systematically investigated prior to this: the context of local-law governed sovereign bonds. We find that investors are willing to pay a premium for CAC bonds in the Euro area relative to non-CAC bonds, and so in countries with worse ratings and more credible legal systems.

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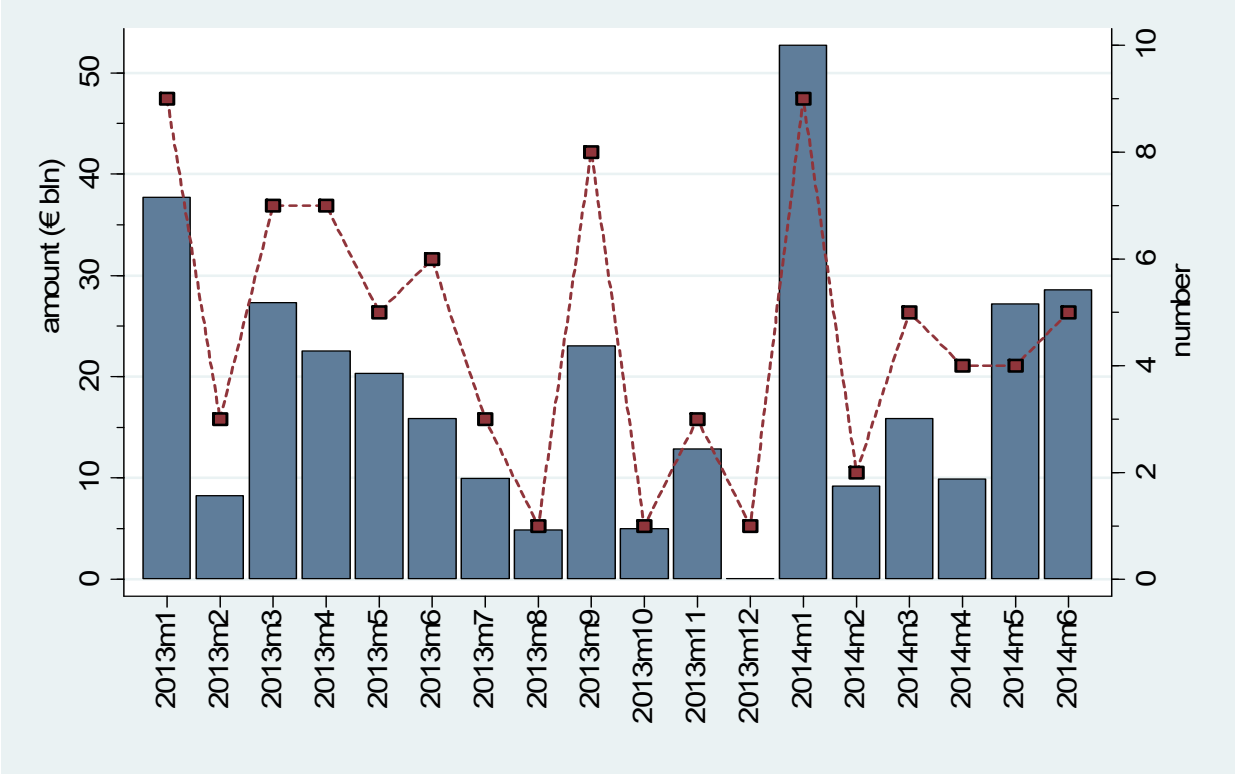

Figure 1

CAC bonds issuances

Monthly time series of CAC bonds new issuances by aggregate amount (blue bars, left vertical axis) and by number of issuances (red squares, right vertical axis). CAC bonds are identified as Euro-denominated zero-coupon or fixed coupon bonds issued under local law by 13 Eurozone countries between January 1, 2013 and June 30, 2014 and with maturity (at issuance) between 1 and 30 years.

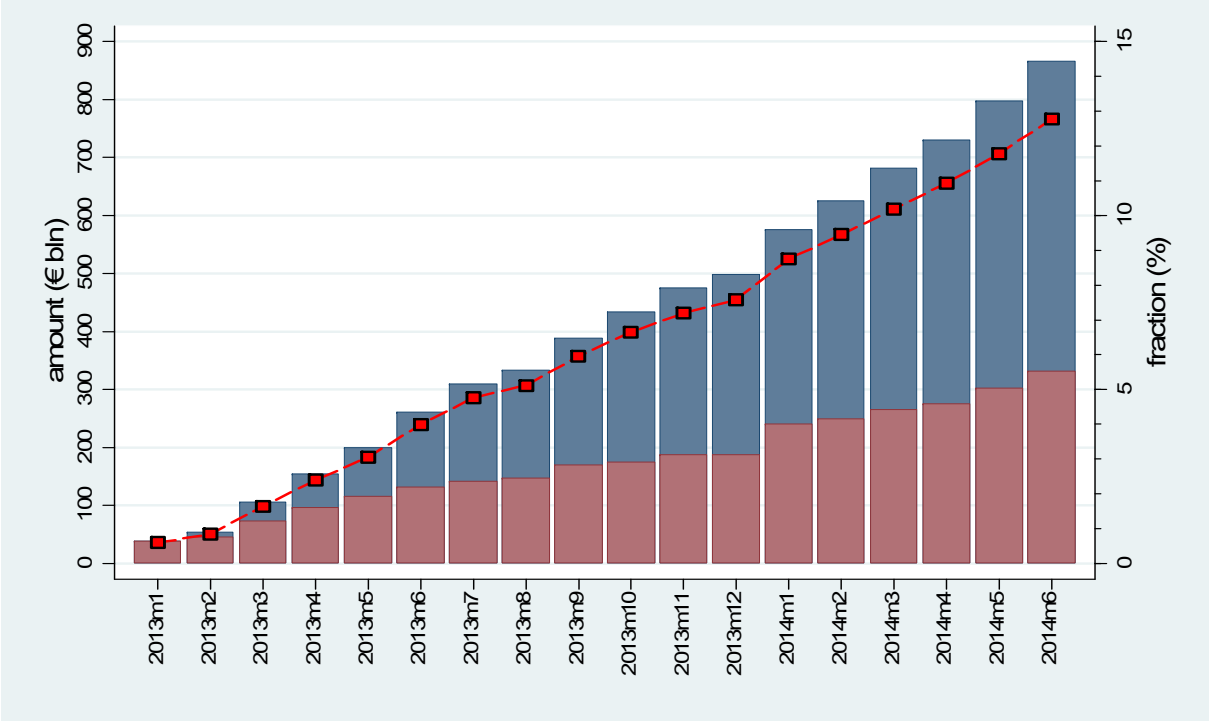

Figure 2
CAC bonds outstanding
Monthly time series of CAC bonds outstanding by aggregate amount (bars, left vertical axis) and by fraction of total long-term government debt outstanding (red squares, right vertical axis). Amount outstanding is split between amount issued (red bars) and amount reopened (blue bars). CAC bonds are identified as Euro-denominated zero-coupon or fixed coupon bonds issued under local law by 13 Eurozone countries between January 1, 2013 and June 30, 2014 and with maturity (at issuance) between 1 and 30 years.

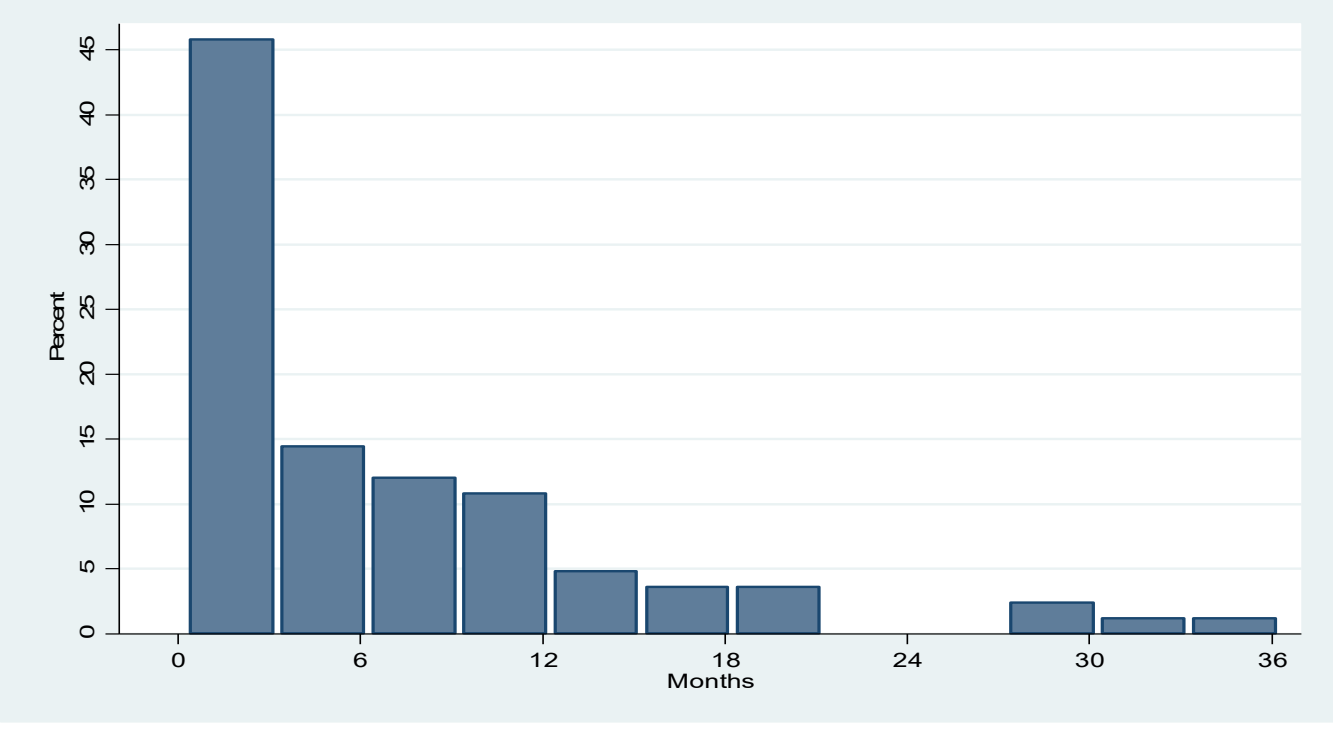

Figure 3

Maturity differential between CAC and matched non-CAC bonds

Histogram of the distance (in absolute value) between CAC and matched no-CAC bonds, expressed in months. CAC bonds are identified as Euro-denominated zero-coupon or fixed coupon bonds issued under local law by 13 Eurozone countries between January 1, 2013 and June 30, 2014 and with maturity (at issuance) between 1 and 30 years. Matched no-CAC bonds are issued before January 1, 2013 and have maturities as close as possible to those of CAC bonds.

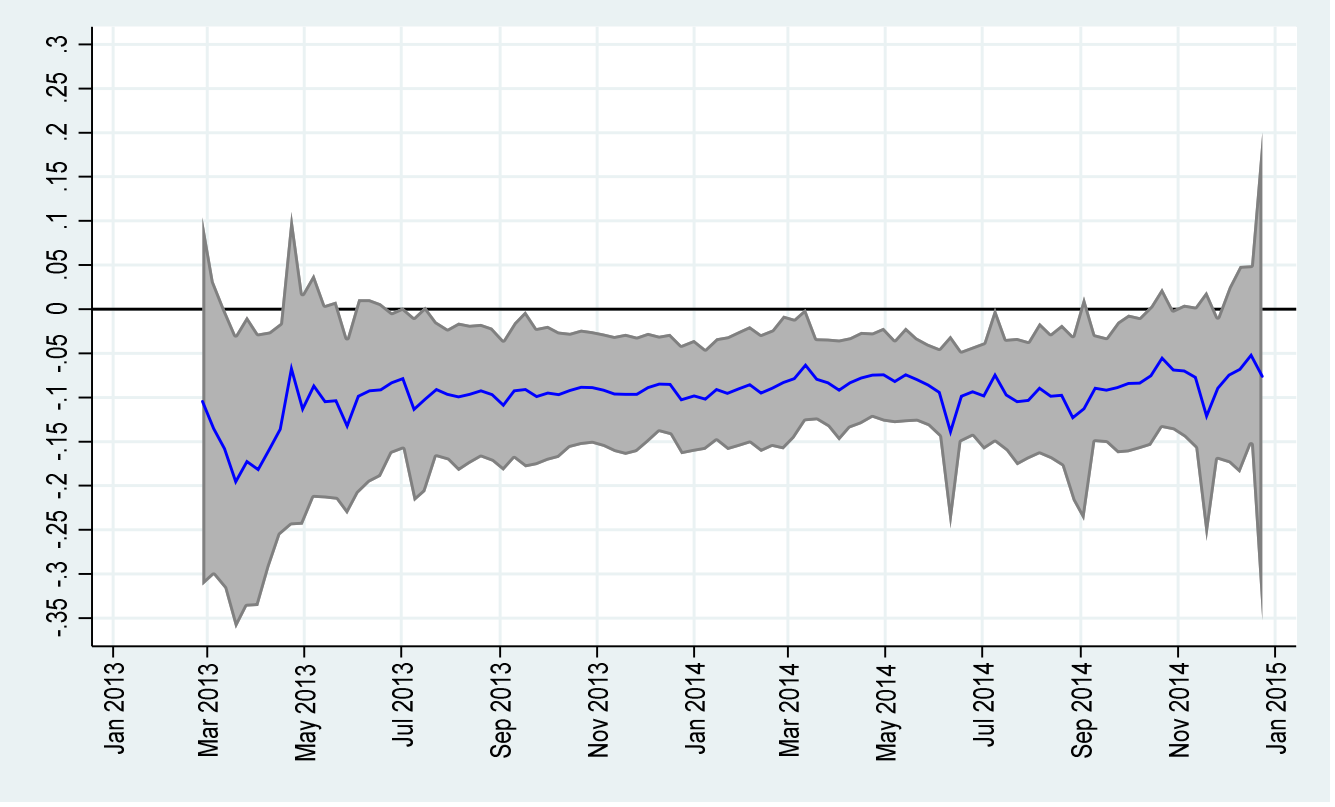

Figure 4

CAC provisions and yield differentials, over time

Point estimates (solid blue line) together with their 99 percent confidence intervals (shaded grey area) of the effect of CAC provisions on yields. The sample ranges from February 25, 2013 to December 30, 2014 and includes 83 bonds issued after January 1, 2013 (CAC bonds) and 83 bonds issued before January 1, 2013 (matched no-CAC bonds). Point estimates are for the CAC indicator from cross-sectional regressions of weekly log-yields on country rating and a series of bond-level controls (duration, size, bid-ask spread, and turnover). Definitions of the explanatory variables are provided in Table A1.

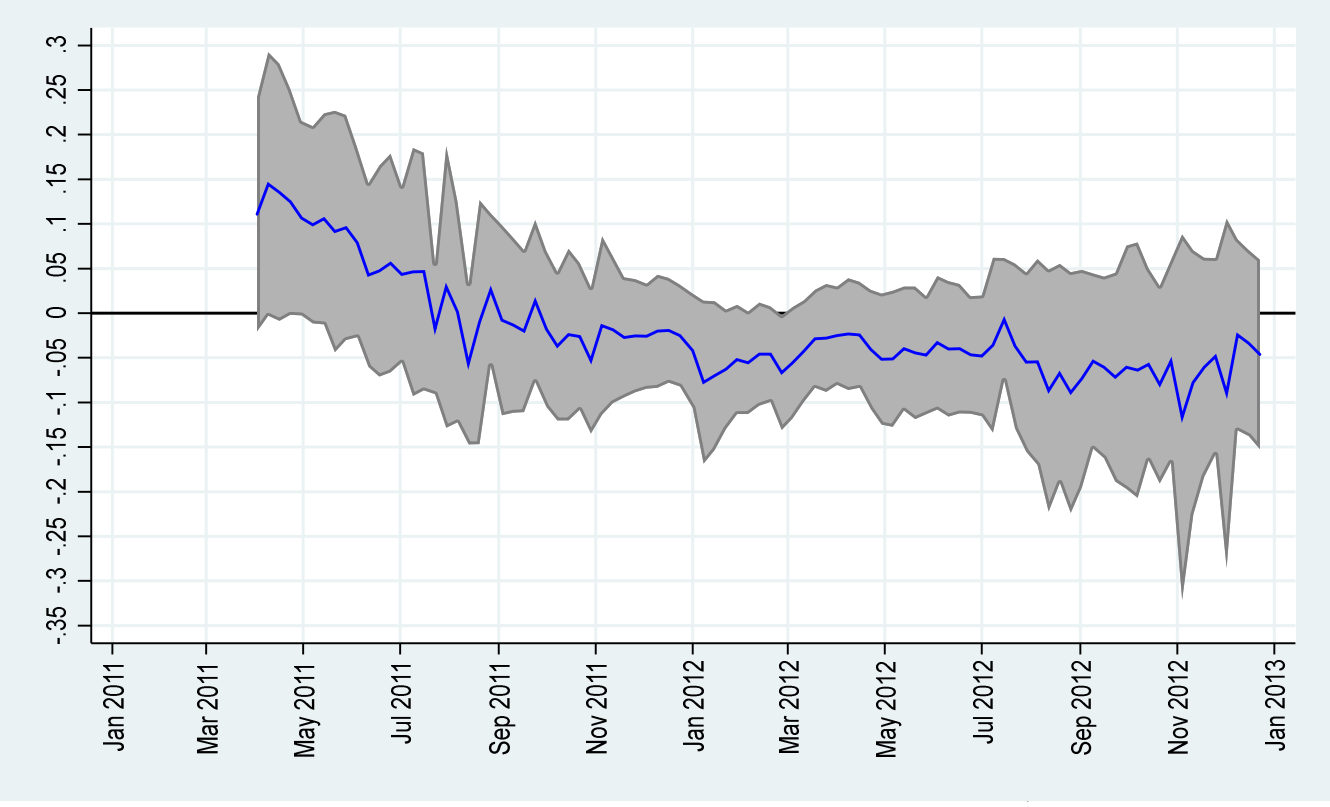

Figure 5

Pseudo CAC provisions and yield differentials, over time (placebo)

Point estimates (solid blue line) together with their 99 percent confidence intervals (shaded grey area) of the effect of Pseudo CAC provisions on yields. The sample ranges from April 4, 2011 to December 28, 2012 and includes 73 bonds issued after January 1, 2011 (Pseudo CAC bonds) and 73 bonds issued before January 1, 2011 (matched Pseudo no-CAC bonds). Point estimates are for the Pseudo CAC indicator from cross-sectional regressions of weekly log-yields on country rating and a series of bond-level controls (duration, size, bid-ask spread, and turnover). Definitions of the explanatory variables are provided in Table A1.

Table 1
Data filtering and country representativeness

Issuer	Initial	CAC provisions	Local law	CAC & Matched no-CAC	Amount (€ bln)
Austria	4	4	4	4	27.35
Belgium	16	13	13	13	47.65
Cyprus	7	7	5	-	-
Finland	3	3	3	3	15
France	10	10	10	10	220.57
Germany	5	5	5	5	90
Ireland	2	2	2	2	13.62
Italy	18	18	18	18	297.57
Luxembourg	2	2	2	1	2
Malta	10	9	-	-	-
the Netherlands	5	5	5	5	76.46
Portugal	6	6	5	5	12.43
Slovakia	4	4	4	4	7.94
Slovenia	4	4	3	3	3.14
Spain	10	10	10	10	179.76
Total	106	102	89	83	993.49

This table describes the country breakdown of bonds at each stage of our data construction process. "Initial" refers to Euro-denominated zero-coupon or fixed coupon bonds issued by national governments in the Eurozone between January 1, 2013 and June 30, 2014 and with maturity (at issuance) between 1 and 30 years. The remaining columns describe country representativeness after each filter: "CAC provisions" requires bonds to be flagged by Bloomberg as including CACs; "Local law" requires bonds to be local-law bonds; "CAC & Matched no-CAC" requires availability of a comparable no-CAC bond. Amount outstanding refers to CAC bonds and is measured at the end of 2014.

Table 2
Sample overview CAC and no-CAC bonds (bond-level variables)

Variable (unit)	CAC bonds (N=5,476)				Matched no-CAC bonds (N=5,476)				Difference
	Mean	Median	5th Pct.	95th Pct.	Mean	Median	5th Pct.	95th Pct.	
Yield (%)	1.65	1.45	0.207	3.995	1.669	1.419	0.206	4.034	0.020
Duration	5.852	6.275	0.969	11.184	5.546	5.684	0.99	10.399	-0.305***
Amount (€mln)	9,801.3	9,126.3	5.7	21,185.8	13,092.1	13,598.3	22.3	28,068.4	3,290.8***
Bid-Ask spread (%)	0.138	0.045	0.013	0.649	0.160	0.049	0.014	0.837	0.022***
Turnover (%)	0.712	0.026	0.000	1.902	0.948	0.006	0.000	2.775	0.237**
Maturity (yrs)	7.644	7.545	1.496	15.789	7.661	7.323	2.003	15.493	0.017

This table presents means, medians, 5th and 95th percentiles for our samples of CAC and matched no-CAC bonds. Matched no-CAC bonds have maturities as close as possible to those of CAC bonds. Maturity for CAC bonds is computed at issuance, i.e., the difference between maturity and issue date; for matched no-CAC bonds it is computed as the difference between maturity date and the issuance date of the CAC bond with which the bond is matched. The time period ranges between January 1, 2013 and December 30, 2014. Descriptive statistics for maturity are computed in the cross-section (83 bonds in each sample); for other variables these are computed in the panel (5,476 bond-week observations in each sample). The last column reports the difference in means between matched no-CAC and CAC bonds together with the t-test statistical significance. *** Significant at the 1 percent level. ** Significant at the 5 percent level. * Significant at the 10 percent level.

Table 3
CAC provisions and yield differentials

dependent variable: weekly log-yields	Random Effects		Pooled Ordinary Least Squares	
	(1)	(2)	(3)	(4)
CAC	-0.084***	-0.053††	-0.112***	-0.098***
	(0.017)	(0.028)	(0.024)	(0.027)
Duration	0.261***	×	0.360***	×
	(0.021)		(0.049)	
Size	-0.026	×	-0.014	×
	(0.016)		(0.010)	
Bid-Ask spread	-0.002	×	0.048	×
	(0.110)		(0.079)	
Turnover	-0.007	×	-0.021	×
	(0.037)		(0.039)	
Rating	0.129***		-0.028	
	(0.014)		(0.074)	
Bond-level Random Effects	Yes	Yes	No	No
Matched bond-level Fixed Effects	No	No	Yes	Yes
Week Fixed Effects	Yes	-	Yes	-
Country Fixed Effects x (Bond characteristics)	No	Yes (×)	No	Yes (×)
Country x Week Fixed Effects	No	Yes	No	Yes
Observations	10,952	10,952	10,952	10,952
Bonds	166	166	166	166
Adjusted R-squared	0.756	0.882	0.883	0.923

This table presents bond-level random effects (columns 1-2) and pooled ordinary least squares (columns 3-4) regression results to examine the relation between CAC provisions and bond yields. The sample ranges from January 1, 2013 to December 30, 2014 and includes 83 bonds issued after January 1, 2013 (CAC bonds) and 83 bonds issued before January 1, 2013 (matched no-CAC bonds). Definitions of the explanatory variables are provided in Table A1. Bond characteristics interacted with country fixed effects in columns 2 and 4 are indicated with ×. Rating is not included in columns 2 and 4 because it is subsumed by the interactions between county and week fixed effects. Effects are either included ("Yes"), not included ("No") or subsumed by other sets of effects ("-"). The table reports the estimated coefficients and below in parentheses the standard errors that are adjusted for clustering at the matched bonds level. *** Significant at the 1 percent level.** Significant at the 5 percent level. †† Significant at the 6 percent level. * Significant at the 10 percent level.

Table 4
CAC provisions and yield differentials: Country creditworthiness and quality of law

Table 4 Panel A. Regression results

dependent variable: weekly log-yields	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Quality of law proxy =	--	--	*DLLS*	*LLSV (EJ)*	*LLSV (RL)*	*Heritage*	*PRS*	*World Bank*
CAC	×	-0.047	-0.265***	-0.048	0.221	-0.038	0.046	-0.047
		(0.037)	(0.092)	(0.120)	(0.185)	(0.077)	(0.108)	(0.037)
Duration	0.278***	0.261***	0.271***	0.287***	0.279***	0.260***	0.260***	0.260***
	(0.018)	(0.021)	(0.023)	(0.023)	(0.022)	(0.021)	(0.020)	(0.021)
Size	-0.008	-0.026	-0.046**	-0.033*	-0.036*	-0.022	-0.023	-0.025
	(0.020)	(0.017)	(0.020)	(0.019)	(0.020)	(0.016)	(0.016)	(0.016)
Bid-Ask spread	0.034	-0.002	0.150	0.110	0.117	-0.018	-0.010	-0.013
	(0.113)	(0.110)	(0.205)	(0.229)	(0.231)	(0.111)	(0.111)	(0.111)
Turnover	-0.002	-0.007	-0.010	0.005	0.004	-0.005	-0.008	-0.006
	(0.036)	(0.037)	(0.041)	(0.037)	(0.036)	(0.036)	(0.037)	(0.037)
Rating	-0.029	0.132***	0.103***	0.069	0.090***	0.099***	0.114***	0.101***
	(0.076)	(0.013)	(0.022)	(0.042)	(0.030)	(0.022)	(0.017)	(0.025)
Rating x CAC		-0.006						
		(0.006)						
Quality of law			0.191**	-0.197*	-0.241**	-0.106**	-0.092*	-0.263
			(0.090)	(0.101)	(0.122)	(0.053)	(0.054)	(0.164)
Quality of law x CAC			0.045*	-0.006	-0.036*	-0.006	-0.016	-0.032
			(0.023)	(0.015)	(0.021)	(0.010)	(0.013)	(0.029)
Week Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	10,952	10,952	10,370	10,010	10,010	10,952	10,952	10,952
Bonds	166	166	158	150	150	166	166	166
Adjusted R-squared	0.803	0.756	0.765	0.769	0.779	0.753	0.755	0.754

Table 4 Panel B. Net impact of CACs

(1) Country=	*AT*	*BE*	*DE*	*ES*	*FI*	*FR*	*IE*	*IT*	*LU*	*NL*	*PT*	*SI*	*SK*
	-0.164***	-0.054	-0.06	-0.01	-0.137**	-0.054	-0.146**	-0.086***	-0.131***	-0.081	-0.254**	-0.127	-0.017
	(0.042)	(0.071)	(0.042)	(0.018)	(0.067)	(0.067)	(0.066)	(0.032)	(0.025)	(0.084)	(0.114)	(0.184)	(0.090)
	[5.0%]	[17.0%]	[6.1%]	[13.0%]	[3.8%]	[10.3%]	[2.6%]	[21.2%]	[1.4%]	[6.2%]	[6.3%]	[1.9%]	[5.3%]
(2) Rating=	*AAA*	*AA+*	*AA*	*A*	*A-*	*BBB+*	*BBB*	*BBB-*	*BB*				
	-0.054*	-0.060**	-0.067***	-0.086***	-0.093***	-0.098***	-0.105***	-0.111***	-0.124***				
	(0.031)	(0.026)	(0.021)	(0.017)	(0.020)	(0.024)	(0.029)	(0.035)	(0.046)				
	[12.6%]	[12.1%]	[25.0%]	[5.5%]	[2.8%]	[3.3%]	[24.0%]	[8.5%]	[6.3%]				
(3) DLLS=	*2.73*	*3.07*	*3.14*	*3.23*	*3.3*	*3.51*	*3.52*	*3.56*	*3.93*	*4.04*	*4.26*	*5.25*	
	-0.143***	-0.128***	-0.125***	-0.121***	-0.118***	-0.108***	-0.108***	-0.106***	-0.090***	-0.085***	-0.075***	-0.031	
	(0.032)	(0.026)	(0.025)	(0.023)	(0.022)	(0.020)	(0.020)	(0.020)	(0.019)	(0.019)	(0.021)	(0.038)	
	[17.9%]	[6.6%]	[4.0%]	[10.8%]	[2.8%]	[6.4%]	[5.3%]	[1.5%]	[6.7%]	[22.3%]	[2.0%]	[13.8%]	
(4) LLSV(EJ)=	*5.5*	*6.25*	*6.75*	*8*	*8.75*	*9*	*9.5*	*10*					
	-0.083**	-0.088***	-0.092***	-0.100***	-0.104***	-0.106***	-0.109***	-0.112***					
	(0.041)	(0.031)	(0.025)	(0.018)	(0.021)	(0.023)	(0.029)	(0.035)					
	[6.9%]	[14.3%]	[23.1%]	[11.2%]	[2.9%]	[6.7%]	[24.0%]	[11.0%]					
(5) LLSV(RL)=	*7.8*	*8.33*	*8.68*	*8.98*	*9.23*	*10*							
	-0.056**	-0.075***	-0.088***	-0.098***	-0.107***	-0.135***							
	(0.027)	(0.020)	(0.017)	(0.017)	(0.019)	(0.029)							
	[17.1%]	[23.1%]	[6.9%]	[11.2%]	[6.7%]	[34.9%]							
(6) Heritage=	*5*	*6*	*7*	*8*	*9*								
	-0.069**	-0.075***	-0.081***	-0.087***	-0.094***								
	(0.028)	(0.020)	(0.016)	(0.018)	(0.025)								
	[26.5%]	[1.9%]	[19.3%]	[27.2%]	[25.1%]								
(7) PRS=	*6.67*	*7.5*	*8.33*	*10*									
	-0.059**	-0.072***	-0.085***	-0.111***									
	(0.025)	(0.018)	(0.016)	(0.028)									
	[26.5%]	[1.9%]	[52.7%]	[19.0%]									
(8) World Bank=	*0.357*	*0.446*	*0.969*	*0.996*	*1.033*	*1.398*	*1.403*	*1.615*	*1.721*	*1.788*	*1.809*	*1.829*	*1.926*
	-0.058**	-0.061**	-0.078***	-0.079***	-0.080***	-0.092***	-0.092***	-0.099***	-0.102***	-0.104***	-0.105***	-0.105***	-0.109***
	(0.028)	(0.025)	(0.017)	(0.016)	(0.016)	(0.018)	(0.018)	(0.022)	(0.024)	(0.025)	(0.026)	(0.026)	(0.028)
	[15.4%]	[3.1%]	[1.3%]	[9.0%]	[3.3%]	[7.4%]	[11.8%]	[4.3%]	[1.9%]	[0.9%]	[4.0%]	[3.4%]	[2.8%]

This table presents bond-level random effects regression results to examine the net impact of country heterogeneity, issuer's creditworthiness and quality of law on the relation between CAC provisions and bond yields. The sample ranges from January 1, 2013 to December 30, 2014 and includes 83 bonds issued after January 1, 2013 (CAC bonds) and 83 bonds issued before January 1, 2013 (matched no-CAC bonds). Definitions of the explanatory variables are provided in Table A1. The CAC indicator is interacted with country fixed effects in column 1 and indicated with ×. Panel A reports the estimated coefficients, and below in parentheses the standard errors that are adjusted for clustering at the matched bonds level. Panel B reports the net effect of CAC provisions for indiviudal countries (indicated by ISO-Alpha 2 country code), for salient country ratings, and for selected values of the quality of law indicators, and below in parentheses the standard errors that are adjusted for clustering at the matched bonds level. Numbers in square brackets in Panel B refer to the percentage of the entire sample (bond-week observations) in a given country, with a given rating or with a given value of quality of law. For the World Bank rule of law index we report the 2013 values. The ISO-Alpha 2 country codes are: AT-Austria, BE-Belgium, DE-Germany, ES-Spain, FI-Finland, FR-France, IE-Ireland, IT-Italy, LU-Luxembourg, NL-the Netherlands, PT-Portugal, SI-Slovenia, and SK-Slovakia. *** Significant at the 1 percent level. ** Significant at the 5 percent level. * Significant at the 10 percent level.

Table 5

Pseudo CAC provisions and yield differentials (placebo)

dependent variable: weekly log-yields	(1)	(2)
CAC	-0.037	-0.024
	(0.030)	(0.026)
Duration	0.163***	×
	(0.026)	
Size	-0.044**	×
	(0.021)	
Bid-Ask spread	0.195**	×
	(0.079)	
Turnover	-0.084	×
	(0.057)	
Rating	0.201***	
	(0.029)	
Bond-level Random Effects	Yes	Yes
Week Fixed Effects	Yes	-
Country Fixed Effects x (Bond characteristics)	No	Yes (×)
Country x Week Fixed Effects	No	Yes
Observations	9,440	9,440
Bonds	146	146
Adjusted R-squared	0.723	0.836

This table presents bond-level random effects regression results to examine the relation between pseudo CAC provisions and bond yields. The sample ranges from January 1, 2011 to December 30, 2012 and includes 73 bonds issued after January 1, 2011 (pseudo CAC bonds) and 73 bonds issued before January 1, 2011 (matched pseudo no-CAC bonds). Definitions of the explanatory variables are provided in Table A1. Bond characteristics interacted with country fixed effects in column 2 are indicated with ×. Rating is not included in column 2 because it is subsumed by the interactions between county and week fixed effects. Effects are either included ("Yes"), not included ("No") or subsumed by other sets of effects ("-"). The table reports the estimated coefficients and below in parentheses the standard errors that are adjusted for clustering at the matched bonds level. *** Significant at the 1 percent level. ** Significant at the 5 percent level. * Significant at the 10 percent level.

Table 6
Pseudo CAC provisions and yield differentials: Country creditworthiness and quality of law (placebo)

Table 6 Panel A. Regression results

dependent variable: weekly log-yields	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Quality of law proxy =	--	*DLLS*	*LLSV (EJ)*	*LLSV (RL)*	*Heritage*	*PRS*	*World Bank*
Pseudo CAC	-0.097*	-0.062	0.018	0.067	0.115*	0.263***	0.029
	(0.051)	(0.138)	(0.122)	(0.262)	(0.062)	(0.098)	(0.027)
Duration	0.163***	0.173***	0.179***	0.180***	0.172***	0.168***	0.169***
	(0.026)	(0.026)	(0.024)	(0.025)	(0.025)	(0.025)	(0.024)
Size	-0.047**	-0.063***	-0.064***	-0.069***	-0.042*	-0.043**	-0.043**
	(0.022)	(0.022)	(0.022)	(0.023)	(0.022)	(0.021)	(0.022)
Bid-Ask spread	0.196**	0.203**	0.190**	0.199**	0.201***	0.203**	0.200**
	(0.079)	(0.083)	(0.082)	(0.079)	(0.077)	(0.080)	(0.078)
Turnover	-0.084	-0.077	-0.081	-0.075	-0.084	-0.088	-0.085
	(0.057)	(0.057)	(0.056)	(0.056)	(0.057)	(0.057)	(0.057)
Rating	0.195***	0.187***	0.177***	0.180***	0.183***	0.190***	0.187***
	(0.030)	(0.030)	(0.036)	(0.033)	(0.034)	(0.032)	(0.035)
Rating x Pseudo CAC	-0.006						
	(0.006)						
Quality of law		0.171***	-0.118**	-0.203***	-0.084*	-0.072	-0.187
		(0.058)	(0.053)	(0.075)	(0.044)	(0.045)	(0.136)
Quality of law x Pseudo CAC		0.001	-0.01	-0.015	-0.021*	-0.037***	-0.057*
		(0.030)	(0.018)	(0.032)	(0.011)	(0.014)	(0.032)
Week Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	9,440	9,198	9,116	9,116	9,440	9,440	9,440
Bonds	146	142	140	140	146	146	146
Adjusted R-squared	0.722	0.728	0.725	0.727	0.724	0.723	0.725

Table 6 Panel B. Net impact of Pseudo CACs

(1) Rating=	*AAA*	*AA+*	*AA*	*AA-*	*A+*	*A*	*BBB+*	*BBB*	*BBB-*	*BB*		
	-0.084*	-0.072*	-0.060*	-0.048	-0.036	-0.023	0.001	0.013	0.026	0.05		
	(0.046)	(0.041)	(0.036)	(0.033)	(0.030)	(0.028)	(0.029)	(0.032)	-0.035	-0.045		
	[23.7%]	[12.2%]	[17.8%]	[2.5%]	[3.6%]	[9.4%]	[24.9%]	[0.1%]	[4.0%]	[1.9%]		
(2) DLLS=	*2.73*	*3.07*	*3.14*	*3.23*	*3.3*	*3.51*	*3.52*	*3.56*	*3.93*	*4.04*	*5.25*	
	-0.061	-0.061	-0.061	-0.06	-0.06	-0.06	-0.06	-0.06	-0.060**	-0.060**	-0.059**	
	(0.060)	(0.051)	(0.049)	(0.047)	(0.045)	(0.040)	(0.040)	(0.039)	(0.030)	(0.028)	(0.029)	
	[17.6%]	[9.0%]	[4.6%]	[10.3%]	[1.0%]	[5.5%]	[3.3%]	[0.9%]	[3.0%]	[23.9%	[20.9%]	
(3) LLSV(EJ)=	*5.5*	*6.25*	*6.75*	*8*	*8.75*	*9*	*9.5*	*10*				
	-0.037	-0.045*	-0.050**	-0.062*	-0.07	-0.072	-0.077	-0.082				
	(0.033)	(0.026)	(0.025)	(0.033)	(0.043)	(0.047)	(0.054)	-0.062				
	[3.0%]	[21.0%]	[24.2%]	[10.4%]	[1.1%]	[5.6%]	[21.0%]	[13.8%]				
(4) LLSV(RL)=	*7.8*	*8.33*	*8.68*	*8.98*	*9.23*	*10*						
	-0.049*	-0.057**	-0.062**	-0.067*	-0.071*	-0.082						
	(0.027)	(0.025)	(0.029)	(0.036)	(0.042)	-0.063						
	[22.1%]	[24.2%]	[3.0%]	[10.4%]	[5.6%]	[34.8%]						
(5) Heritage=	*5*	*7*	*8*	*9*								
	0.009	-0.034	-0.055	-0.076								
	(0.019)	(0.028)	(0.037)	(0.047)								
	[25.9%]	[23.2%]	[27.1%]	[23.8%]								
(6) PRS=	*6.67*	*8.33*	*10*									
	0.019	-0.042	-0.104**									
	(0.024)	(0.030)	(0.048)									
	[25.9%]	[55.7%]	[18.4%]									
(7) World Bank=	*0.421*	*0.572*	*1.026*	*1.176*	*1.404*	*1.44*	*1.607*	*1.765*	*1.802*	*1.811*	*1.814*	*1.956*
	0.005	-0.004	-0.029	-0.038	-0.051	-0.053	-0.062	-0.071	-0.073	-0.074	-0.074	-0.082
	(0.021)	(0.021)	(0.026)	(0.029)	(0.035)	(0.036)	(0.040)	(0.045)	(0.046)	(0.046)	(0.046)	(0.050)
	[17.1%]	[1.9%]	[1.9%]	[14.3%]	[13.1%]	[7.1%]	[4.1%]	[1.0%]	[0.9%]	[2.1%]	[6.2%]	[3.2%]

This table presents bond-level mixed random effects regression results to examine the net impact of issuer's creditworthiness and quality of law on the relation between pseudo CAC provisions and bond yields. The sample ranges from January 1, 2011 to December 30, 2012 and includes 73 bonds issued after January 1, 2011 (pseudo CAC bonds) and 73 bonds issued before January 1, 2011 (matched pseudo no-CAC bonds). Definitions of the explanatory variables are provided in Table A1. Panel A reports the estimated coefficients, and below in parentheses the standard errors that are adjusted for clustering at the matched bonds level. Panel B reports the net effect of pseudo CAC provisions for salient country ratings and for selected values of the quality of law indicators, and below in parentheses the standard errors that are adjusted for clustering at the matched bonds level. Numbers in square brackets in Panel B refer to the percentage of the entire sample (bond-week observations) with a given rating or with a given value of quality of law. For the World Bank rule of law index we report the 2011 values. *** Significant at the 1 percent level. ** Significant at the 5 percent level. * Significant at the 10 percent level.

Appendix Table A1
Definition of variables

Panel A: Main variables

Variable	Description	Unit/Scale
CAC	=1 if bond has CAC provisions, =0 otherwise	0/1
Pseudo CAC	=1 if bond issued between Jan 2011 and June 2012, =0 otherwise	0/1
Duration	Macaulay Duration-0.5×(Convexity/100)	-
Size	Amount outstanding	Mln € (log)
Bid-Ask spread	Percentage bid-ask spread $(P_{ASK}-P_{BID})/P_{MID}$	%
Turnover	Traded volume across exchanges /Amount outstanding	Decimals
Rating	S&P local currency LT debt issuer rating	1(AAA) to 12(BB)

Panel B. Quality of law proxies

Variable name	*Acronym*	Description	Source	Min-max sample values [country code]
Formalism Index	*DLLS*	«Substantive and procedural statutory intervention in judicial cases at lower-level civil trial courts.» (7 point scale, good to bad). Not available for Slovakia.	Djankov, La Porta, Lopez-de-Silanes, Shleifer, Courts, 2003, *Quarterly Journal of Economics* 118, 2(1), 453-517	2.73 [BE] 5.25 [ES]
Judicial Efficiency Index	*LLSV (EJ)*	«Efficiency and integrity of the legal environment as it affects business, particularly foreign firms.» (10 point scale, bad to good). Not available for Luxembourg, Slovakia and Slovenia.	La Porta, Lopez-de-Silanes, Shleifer, Vishny, Law and Finance, *Journal of Political Economy*, 1998, 106(6), 1113-1155	5.5 [PT] 10 [FI, NL]
Rule of Law Index	*LLSV (RL)*	«Law and order tradition.» (10 point scale, bad to good). Not available for Luxembourg, Slovakia and Slovenia.	La Porta, Lopez-de-Silanes, Shleifer, Vishny, Law and Finance, *Journal of Political Economy*, 1998, 106(6), 1113-1155	7.8 [ES, IE] 10 [AT, BE, FI, NL]
Property Rights Index	*Heritage*	«The extent to which a country's legal framework allows individuals to accumulate private property freely, secured by clear laws that the government enforces effectively.» (100 point original scale; rescaled on a 10 point scale, bad to good). Contemporaneous values.	Heritage Foundation, Index of Economic Freedom https://www.heritage.org/index/	5 [IT] 9 [AT, DE, FI, IE, LU, NL]
Law and Order Index	*PRS*	«Law and Order" form a single component, but its two elements are assessed separately, with each element being scored from zero to three points. To assess the "Law" element, the strength and impartiality of the legal system are considered, while the "Order" element is an assessment of popular observance of the law.» (6 point original scale; rescaled on a 10 point scale, bad to good). Lagged values.	PRS Group/ICRG Political Risk Rating https://www.prsgroup.com/	6.67 [IT, SK] 10 [AT, FI, IE, LU, NL]
Rule of Law Index	*World Bank*	«Rule of law captures perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence.». (5 point scale from -2.5 to 2.5, bad to good). Lagged values.	World Bank, Worldwide Governance Indicators http://databank.worldbank.org/ (2014 update)	0.357 [IT] 1.943 [FI]

This table provides a detailed description of our variables. Panel A: ratings are measured every Friday; all other variables are weekly averages of daily values. Data source is Bloomberg. Panel B: data source as indicated. December values for PRS sourced from https://info.worldbank.org/governance/wgi/pdf/prs.xlsx. The ISO-Alpha 2 country codes are: AT-Austria, BE-Belgium, DE-Germany, ES-Spain, FI-Finland, FR-France, IE-Ireland, IT-Italy, LU-Luxembourg, NL-the Netherlands, PT-Portugal, SI-Slovenia, and SK-Slovakia.