The Price of Law: The Case of the Eurozone Collective Action Clauses[*]

Elena Carletti (Bocconi University and CEPR)

Paolo Colla (Bocconi University)

Mitu Gulati (Duke University)

Steven Ongena (University of Zurich, SFI, KU Leuven and CEPR)

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Abstract. Do markets value contract protections and does the quality of a legal system affect such valuations? We answer these questions by analysing a quasi-natural experiment whereby after January 1, 2013, newly issued sovereign bonds of all Eurozone countries started to include Collective Action Clauses (CACs) specifying the minimum vote needed to modify repayment. We find that the new contract term is priced, i.e., CAC bonds trade at lower yields relative to otherwise similar bonds that do not include CACs, and also that the quality of the legal system matters for this differential: The better the legal system, the lower the yield.

I. Introduction

Whether, and to what extent, markets price contract terms is a key question in both law and finance. No one doubts that contract terms matter "at the back end" when things go bad and it has to be decided how to divide up the limited assets of the borrower (e.g., Smith and Warner, 1979; Carletti et al., 2016). The real issue is to what extent differences in the contract terms matter to the cost of capital "at the front end", that is in normal times when the deal is being struck and no one really wants to talk about what will happen if things go bad (e.g., Bradley and Roberts, 2015). For the finance scholars this is a question of the degree to which markets are efficient. For the legal scholars it is a question of whether and when law and lawyers matter.

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One instance where the pricing question of contract terms has been investigated is the inclusion in sovereign bonds of Collective Action Clauses (CACs) provisions, which specify the minimum vote required to modify the payment terms. This issue has been at the forefront of the policy and academic debate since the late 90s in the aftermath of the Mexican crisis when CACs were introduced as a contractual solution to facilitate sovereign restructurings and reduce the cost of default (Haeseler, 2009; Panizza, Sturzenegger, and Zettelmeyer, 2009; Aguiar and Amador, 2014).[1] On theoretical grounds, the price impact of CACs depends on which agency problem they aim to address. Kletzer (2003) and Haldane et al. (2005) show that CACs improve the coordination among creditors and thus reduce holdouts, although they may induce delays in negotiation (Pitchford and Wright, 2012). In this respect, they represent pro-creditor provisions that translate 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, thus exacerbating 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 differences associated with CAC provisions (e.g., Tsatsaronis, 1999; Becker, Richards and Thaicharoen, 2003; Gugiatti and Richards, 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, 2013), or lower yields for middle quality issuers only (Bardozzetti and Dottori, 2014). Overall, the trade-off between orderly restructuring and moral hazard seems far from being resolved.

The reasons behind the mixed evidence in the empirical literature may be numerous. 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 is that bonds issued under English law have CACs, while those under New York law do

[1] The policy debate at that time centered around the IMF proposal of a statutory sovereign debt restructuring mechanism (SDRM). Failing to achieve consensus, the proposal was shelved and the inclusion of CACs prevailed as the only viable solution to facilitate debt restructuring (Gelpern and Gulati, 2006). The need for a bankruptcy regime for sovereigns (similar to the one that applies to banks and non-financial firms) has recently gained renewed momentum in the aftermath of the Eurozone sovereign debt crisis and the various rulings on the Argentinian case (see Bolton, 2016). Other ways to facilitate sovereign debt restructuring that are currently under discussion include an explicit seniority structure (Chatterjee and Eyigungor, 2015).

not. However, as shown in Bradley and Gulati (2013), 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 very rarely of both. Thus, 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 contribute to the literature on the price impact of debt contract terms by making use of a unique experiment – the mandatory introduction of CACs in local law bonds of Eurozone countries as of January 1, 2013. This initiative, whose origins date back to the Deauville beach walk of Angela Merkel and Nicholas Sarkozy, was intended to favor the private sector involvement in future sovereign debt crises and avoid the (legal) uncertainty surrounding the Greek restructuring (Gelpern and Gulati, 2013).

This legal experiment allows us to analyze two distinct questions. First, we revisit the price impact of CAC provisions overcoming some of the difficulties faced by the existing literature. The inclusion of standardized and identical contract terms mandated by the Euro CAC initiative allows us to keep law fixed (domestic law) and safely regard CACs inclusion as a binary variable exogenous to the issuer. Moreover, given the large number of bonds issued by Eurozone countries, we can compare bonds with similar characteristics (including the law) except the new provision. Thus, we identify the price impact of CACs *within* countries rather than *across* countries. This reduces potential selection effects, such as to the choice of including CAC provisions.

Second, focusing on bonds issued under domestic (as opposed to foreign) law allows us to bring a novel and important dimension to the debate by linking the price impact of CACs to the quality of the legal system.[2] As it became clear during the Greek debt restructuring in 2012, domestic law bonds can be restructured by the domestic legislature changing the law. Thus, with respect to foreign law bonds, they entail *legal risk* associated with the government's ability to change

[2] An emerging body of literature inquiries into the relationship between quality of the legal system and the evolution of contract provisions both theoretically (e.g., Anderlini, Felli and Riboni, 2014; Gennaioli and Ponzetto, 2015) and empirically in the context corporate provisions (e.g., Lerner and Schoar, 2005; Qian and Strahan, 2007).

provisions retroactively after issuance (Allen & Overy, 2012).[3] Such legal risk is related to the quality of the legal system that affects contract interpretation and enforcement, in particular when the defendant is the state itself. We make use of the heterogeneity in the quality of legal systems across Eurozone countries to investigate whether, and to what extent, legal risk affects the price impact of CACs. This goes to the heart of the Euro CAC initiative that, some have asserted, was intended to forestall the possibility of a "Greek-type" retrofit in the future (Bauer, 2013).

Our empirical strategy and main findings are as follows. First, we compare the secondary market yields of Eurozone bonds issued after January 1, 2013 (i.e., bonds with CAC provisions) with those of bonds issued prior to that date (i.e., bonds without CAC provisions). Since domestic law bonds constitute the lion's share of Eurozone sovereign debt, 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 close residual maturities. In line with the theoretical literature, we expect CAC bonds to trade at lower yields, as long as CACs are perceived pro-creditor provisions specifying in advance the "rules of the game" upon restructuring.

We find a significant yield differential: Our estimates indicate that yields on CAC bonds are, on average, 7.8%-12.2% lower than those of matched no-CAC bonds – or equivalently they are lower by 13 to 20 basis points (bps). This yield differential is persistent over time and, consistent with Bradley and Gulati (2013), it gets larger as the borrower's credit quality deteriorates.[4] Overall, these findings support the hypothesis advanced by some European policy makers that CAC provisions help with orderly restructuring.

Second, we measure the quality of law by means of country-level indicators. Our working assumption is that countries with better quality of law should be less prone to renege on the new CAC provisions by means of a "Greek-type" retrofit. For these countries we expect legal risk to be limited, and thus the yield premium on CAC bonds relative to matched no-CAC bonds to be larger. Exploiting the heterogeneity in the quality of law in our sample of Eurozone countries, we document that this is indeed the case.

[3] Accordingly, domestic law bonds should trade at higher yields relative to foreign law bonds, as empirically documented in a recent stream of papers (Choi, Gulati and Posner, 2011; Chamon, Schumacher and Trebesch, 2014; Clare and Schmidlin, 2014; Nordvig, 2015). This is in line with the hypothesis in Bolton and Jeanne (2009) that debt that is harder to restructure (e.g. foreign law debt), in legal terms, is de facto senior and therefore should have lower yields.

[4] This result may appear in contrast with the evidence in Bardozzetti and Dottori (2014) that the premium for CAC provisions is significant for issuers in the middle of the credit quality spectrum but not for highly speculative issuers (rating B+, or worse). We do not have countries with such low ratings in our sample.

Finally, we investigate the impact of the Euro CAC initiative on the cost of funding. The goal here is to assess whether markets might view CACs inclusion as an anti-bailout mechanism, as suggested by many observers (Gelpern and Gulati, 2013). In this respect, our previous finding on the yield differential between CAC and matched no-CAC bonds is not conclusive. For instance, it may well be that yields on matched no-CAC bonds have increased after January 1, 2013 relative to before. If this was the case, the cost of funding in the aftermath of the Eurozone CAC initiative would be larger, despite the fact that CACs are associated with lower yields. Moreover, there is the issue of how our matched no-CAC bonds are representative of the overall cost of funding. To address these issues, we augment the dataset we use by means of a *random* sample of bonds without CAC provisions issued before January 1, 2013. Then, we conduct a diff-in-diff exercise on the yields of both groups of no-CAC bonds (matched and random) before and after January 1, 2013. We find that, depending on the model specification, yields on both groups of bonds either significantly decrease or remain unchanged after the introduction of CACs. We interpret this result as providing support to the view that CACs were not perceived by the markets as anti-creditor provisions.

To complete the analysis we perform two additional exercises. First, we assess whether the Euro CAC initiative has affected borrowers' behavior in terms of issuance activity. Indeed, a feature of the initiative was to allow governments to reopen, up to a certain limit, pre-2013 bonds that did not include CAC provisions. We do not find systematic differences in the issuance activity of new CAC bonds relative to that of pre-2013 bonds. Thus, we conclude that sovereign borrowers did not exploit the possibility of reopening old bonds as a way to delay the inclusion of CAC provisions. Second, we investigate whether our findings on the price impact of CACs are robust to unconventional monetary policy – in particular, the European Central Bank's Securities Markets Programme (SMP) and the Outright Monetary Transactions (OMT). We document that our results go through, even when we allow unconventional monetary policy to affect bond yields differently in the cross-section of countries.

To sum up, we document that CAC provisions are viewed favorably by market participants: As they allow for orderly restructuring, bonds with CACs obtain higher prices (equivalently, lower yields) than comparable bonds without CACs. This price impact is more pronounced in countries with a sizable probability of default and, importantly, with a good quality legal system. Moreover, we find no evidence that CACs have increased the cost of funding for Eurozone sovereigns. Our analysis makes use of a legal experiment that encompasses a series of desirable features that are rare to find:

It involves the modification of a single contract clause, this change is exogenous to the issuers, and contracts with the new clause can be compared with otherwise identical contracts. As such, the Eurozone CAC initiative constitutes a unique laboratory to address the question of whether, and to what extent, markets price contract terms.

The paper is organized as follows. Section II provides some background on the Euro CAC initiative. Section III describes the dataset construction. Section IV presents the empirical findings on the price impact of CAC provisions. Section V examines the reopening of pre-2013 bonds, a feature of the Euro CAC initiative. Section VI evaluates the role of unconventional monetary policy on our pricing results. Section VII concludes.

II. Background on the 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 Eurosystem: CACs were a key element of this policy response (Hofmann, 2014).

CACs are contract provisions that allow for a majority of creditors in a single bond, or across bonds, to vote to modify the payment obligations to the debtor (with the permission of the debtor). They allow for the debtor in crisis 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 (Bauer, 2013).

The Euro CAC initiative provides for the mandatory inclusion of standardized and identical CACs in all new Eurozone sovereign bonds issued after with maturities greater than one year. The CACs apply to both international and domestic 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%) as well as across series of bonds (75%).

Prior to January 2013, the overwhelming majority of bonds of Euro area countries were local law governed and contained no such contract provisions (Credit Suisse, 2012). If a sovereign wanted to restructure its bonds, it would have, in theory, had to go to each individual bondholder and ask him

or her to voluntarily take a haircut; an impossible task. Alternatively, given that the bonds were under local law, the local legislature could − at least in theory − use its power to legislate local law specifying ex post the applicable modification procedures for the bond. This is precisely what happened in Greece, in March 2012, when CACs were legislatively imposed on the existing local law bonds to conduct the restructuring; a move decried by many market participants as coercive and lawless (Burn, 2013; Bauer, 2013).

The retroactive imposition of these CACs was challenged in a variety of legal fora, including local courts in Greece, international arbitration, and in the European Court of Human Rights.[5] The basic claim was that bondholders had had their property unlawfully expropriated. As of today, the Greek restructuring has withstood all of the challenges. In other words, the actions that Greece took in retrofitting CACs onto its local law bonds has been considered to be legal.

In shaping the Euro CACs, Euro area policy makers borrowed from a US Treasury Department initiative from roughly a decade prior, in 2002-03. That initiative, which originated in the aftermath of the Mexican and Argentinian crises, 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 than the emerging market version 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 the 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 Euro CAC initiative engineered, "in one blow", what was likely the single biggest change to sovereign bond contract terms ever (Gelpern and Gulati, 2013).

What were the rationales behind the Euro CAC initiative? Boiled down from the discussions at the time, Gelpern and Gulati (2013) extract two distinct views of the policy move. First, there were those that saw CACs as a commitment to avoid a Greek-style retroactive change in the law in the future. These commentators and policy officials perceived the CACs to be a credible mechanism that would assure investors that future restructurings would proceed in a predictable and orderly

[5] Challenges have been brought before the Greek Council of State, in the World Bank's arbitral forum, and before the European Court of Human Rights. See *Postova Banka and Istrokapital SE v. Hellenic Republic*, ICSID Case Arb/13/8 (April 9, 2015); *Symvoulio tis Epikrateias*, Decision of the 1116-1117/2014 (21.3.14) of the Greek Council of State (Συμβούλιο της Επικρατείας); and *Mamatas and Others v. Hellenic Republic*, European Court of Human Rights, 256 (21.07.2016).

fashion. Second, there were those who believed that CACs would reduce the likelihood of a bail-out in the future, as private creditors of Eurozone countries were now forewarned that they could be restructured.

The foregoing views assumed that CACs will operate in an identical way across the member countries of the Eurozone, and, as a matter of fact, the Article 12(3) of the ESM Treaty specifies that: "Collective action clauses shall be included, as of 1 January 2013, in all new euro area government securities, with maturity above one year, in a way which ensures that their *legal impact is identical*" (emphasis added). However, since the provisions are included in *domestic law* bonds, the question is whether imposing an identical contract term on the bonds of seventeen different countries, subject to seventeen different legal systems, will have the same effects (Borroso, 2013). In particular, from an investor perspective, the key question is the degree of protection the local law provides against the legislature someday trying to retroactively change the CACs to make it easier for the sovereign to restructure (Kopf, 2013). In principle, it should be easier for a sovereign to retroactively change the rules governing a restructuring in a bond that has no rules specified than in one that has a pre specified set of procedures. But the question of how difficult it is will depend on the specific legal system and how much protection it provides to investor expectations or property rights. For example, if Italian law and Italian courts are less protective of investor rights than are Austrian law and Austrian courts, then CACs in Italian law bonds are going to be more vulnerable to ex post manipulation by the sovereign than they would be under Austrian law bonds.

The Greek retrofit of 2012 highlights the fact that domestic law bonds incorporate legal risk,[6] as governments may amend the terms of bond contracts written under domestic law and domestic courts may side local governments. The Euro CAC initiative, whose provisions apply to bonds issued under domestic law, provides us with a unique laboratory to explore the relation between quality of law and legal risk.

[6] The courts that ruled on the legality of the Greek 2012 restructuring though made it clear that their rulings were context specific; and a key factor for them was that investor expectations had not been violated. An open question that remains is whether a local law bond that starts out having CACs can have those CACs changed retroactively by legislative fiat. Going by the rulings of the courts so far, it seems less likely that such action would be deemed legal – given the context of government officials having touted to investors the value of the CACs as providing a predictability in how future restructurings in the Euro area would done. Precisely how much less likely though will depend on the local law in question and the protections it gives investors vis-à-vis property rights. This view is consistent with that expressed by Credit Suisse in its report to investors of the implications of the introduction of Euro CACs, where it sets forth a hierarchy of different types of government bonds in terms of their vulnerability to restructuring and ranks Euro area sovereign bonds (under local law) with CACs as less vulnerable than those without CACs (Credit Suisse, 2012).

III. Dataset Description

In our analyses we will make use of different samples of bonds: Bonds with CAC provisions issued after January 1, 2013 ("CAC bonds"), bonds without CAC provisions issued before January 1, 2013 among which some have similar characteristics to CAC bonds ("Matched no-CAC bonds") and others that are randomly selected ("Random 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.[7] We further require bonds to be flagged by Bloomberg as including CACs, thus dropping 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 sources with hand-collected data. We are able to find the governing law of 93 bonds issued by 14 Eurozone countries,[8] out of which we identify 89 as local 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, and consider bonds issued under local law that 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% 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% German no-CAC bond issued on

[7] 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.
[8] We drop bonds issued by Malta because we cannot retrieve their governing law.

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.[9]

The third sample (random no-CAC bonds) contains 83 randomly extracted bonds (without replacement) from the previously identified pool of no-CAC bonds excluding those that we have already matched with CAC bonds.

Table 1 provides the country breakdown of the different samples at each stage of our data construction procedure. The number of bonds in the CAC (and matched no-CAC) sample reflects the relative indebtedness of countries where Belgium, France, Italy and Spain account for more than 50% of issuances. The country representation of the random no-CAC sample differs, by construction, from that of the other two groups. Specifically, bonds in the random sample weigh more on fiscally virtuous countries such as France and Germany.

Figure 1 displays the issuance activity (amount at issuance as well as number of issuances) of CAC bonds between January 2013 and June 2014. By the end of June 2013 all countries but Luxembourg had issued at least one bond with CAC. Figure 2 plots the time-series of the amount outstanding (sum of amount at issuance and reopenings) of CAC bonds in Eurozone countries, both in absolute terms and relative to the overall amount of long-term government debt. 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% of the aggregate outstanding amount of CAC bonds. Figure 2 further reveals that by the end of June 2014 about 13% of long-term bonds included the new Euro CAC provision.[10] 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), and amount outstanding 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 samples of matched and random no-CAC bonds we collect the same variables

[9] The matching procedure excludes five CAC bonds issued by Cyprus since before 2013 Cyprus issued bonds under English law only. We further discard the 15YR 2.25% 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).

[10] 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 SDW).

between January 1, 2011 (or the issue date, for bonds issued after January 1, 2011) and December 30, 2014 (or the maturity date). We compute duration and convexity from daily yields, and percentage bid-ask spreads from daily prices. To reduce the measurement error that may contaminate daily yields (and bid-ask spreads), 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.

Panel A in 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% 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 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 samples. For 51 bond pairs (representing more than 60% of our sample) the difference in maturities is less than 6 months, and for 69 pairs (representing more than 80% of our sample) less than one year.

Descriptive statistics of bond-level variables for the matched and random no-CAC samples are reported in Table 2-Panel B. Here, the time period ranges between January 1, 2011 and December 30, 2014. On average, random no-CAC bonds have lower yields and duration, larger amount outstanding, and lower bid-ask spreads. We do not detect significant differences in maturities between the two samples.

IV. Empirical Analysis

We now turn to empirically analyse our questions: First, are CACs priced, i.e., are they associated with yield differentials? Second, does the CACs price impact depend on the quality of law? Third, what is the impact of the Euro CAC initiative on borrowers' cost of funding?

IV.a. 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 specification:

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

where $y_{i,c,t}$ is the log of the mid-yield (in %) for bond *i* (issued by country *c*) during week *t*, 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), $X_{i,c,t}$ is a vector of control variables, and θ_i is a bond-specific time invariant effect. The vector $X_{i,c,t}$ includes variables common to all countries, as well as country- and bond-specific variables (definitions of the explanatory variables are collected in Table A1 in Appendix). In a first set of specifications, we include the Euro area government bond yield at 10 years ($y_{EU,t}$, in logs) to account for general movements in sovereign bonds yields and the Euro STOXX 50 Volatility Index ($VSTOXX_t$) as a proxy for market volatility. Alternatively, we replace these macro variables with time (week-) fixed effects. 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 $Risk_{c,t}$. Higher values of $Risk_{c,t}$ 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 series of dimensions (issuer, currency, law, and residual maturity), other bond-level characteristics impinge on risk and, in turn, on yields. As a first proxy for bond risk we include duration ($Dur_{i,c,t}$), which is affected, among others, by the coupon structure (rate and frequency of payment). Alternatively, we create the variable $Duration(Aug)_{i,c,t} = Dur_{i,c,t} - 0.5 \times \frac{Conv_{i,c,t}}{100}$ which corrects duration by bond convexity.[11] Finally, since by construction matched no-CAC bonds are off-the-run while CAC bonds are on-the-run,[12] we control for liquidity by means of bond $Size_{i,c,t}$, i.e., the log of outstanding amount (in Euro mln), and bid-ask spread (in %), $BAS_{i,c,t}$. Note that bond size is usually time-varying, at the bond level, due to reopenings. Table 3 reports random-effects (RE) estimation results for several specifications. Standard errors are clustered at the country level to control for within-country residual correlation.

[11] In principle, we could include convexity as an additional measure of bond risk. However, in our sample, duration and convexity are highly collinear (linear correlation equals 0.934). We therefore opt for an alternative measure of bond price risk.

[12] 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 first two columns of Table 3 highlight that the pattern in the general level of sovereign yields as well as market-wide volatility positively affect bond yields. Table 3 further documents that including time fixed effects improves the explanatory power of our model. This is not surprising given the abundant evidence of co-movement in Eurozone sovereign risk in recent years (see Gündüz and Kaya, 2014). Moreover, yields increase with country-risk as well as bond-specific risk across all specifications. As far as liquidity measures are concerned, although they enter with the right sign, they are overall insignificant.[13]

Turning to our main variable of interest, CAC provisions negatively affect bond yields: Our estimates indicate that yields on CAC bonds are, on average, 7.78% to 12.19% lower than those of matched no-CAC bonds – or equivalently they are lower by 13 to 20 bps (i.e., $7.78\% = 1 - \exp(-0.081)$ and $12.19\% = 1 - \exp(-0.130)$).

The data-pooling used in panel estimation may hide a different pattern in different time periods. To address this issue, we perform an OLS cross-sectional regression for each week. The equation estimated at each time *t* is the same as in specification (1), dropping the time-varying variables common to all bonds, and including augmented duration as a proxy for bond-level risk (the analysis with duration gives similar results). 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 R-squared is above 0.6 in every week. The point estimates for the coefficient on the CAC indicator are plotted in Figure 4 (dashed line) together with a four-week moving average (solid line). The average between these point estimates is -0.097, which is in line with findings reported in Table 3. As shown in the figure, the yield differential between CAC and matched no-CAC bonds is persistently negative throughout the sample period.

In line with the existing empirical literature, we then investigate the interplay between the yield differential and issuers' creditworthiness. To this end we add to specification (1) the interaction between the CAC indicator and $Risk_{c,t}$ and estimate:

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

[13] This lack of significance is not surprising in light of the mixed evidence on the role of liquidity for Euro-zone government bonds: Favero, Pagano and von Thadden (2010) find that liquidity differentials are priced only for a subset of EMU countries, while Beber, Brandt and Kavajecz (2009) show that liquidity matters in times of economic distress.

Regression results for specification (2) are reported in Table 4. The dependence of yields on control variables is in line with Table 3. According to specification (2) the net effect of CAC provisions is:

$$\beta_0 CAC_i + \beta_1 CAC_i \times Risk_{c,t}$$

which we report in Table 4 for selected credit ratings (AAA, A, and BB) and in Figure 5 for all ratings in our sample of Eurozone countries – again, for reasons of space, we show in Figure 5 the effects when including augmented duration as a proxy for bond-level risk. While yields on CAC bonds are not different from those of matched no-CAC bonds in countries at the top of the rating scale (AAA and AA+), they are significantly lower as issuers' credit quality deteriorates.

Overall, these findings support the hypothesis that CAC provisions help with orderly restructuring and particularly so when issuers' probability of default is sizable.

IV.b. CAC Provisions and Quality of Law

After establishing that CAC bonds are associated with lower yields relative to matched no-CAC bonds, we now analyze how this yield differential depends on the strength of the legal system. Although Euro CACs are mandatory and standardized across countries, their implementation (and thus, their value) in local law bonds may vary across national jurisdictions that differ as regards, for example, the protection of property and contract rights.

Under weak legal systems, investors are likely to attach relatively little value to CACs because they will expect the local courts to either uphold, or never get around to deciding on, the decision of the government to retroactively modify bond contracts: Thus, yields on CAC bonds should be minimally different from yields on matched no-CAC bonds. By contrast, under strong legal systems, investors are likely to draw a distinction between bonds with and without CACs as they expect local courts to respect the new provisions: Thus, CAC bonds should trade at lower yields relative to matched no-CAC bonds.

To investigate whether the quality of law matters to CAC pricing, we proceed as follows. First, we proxy for countries' quality of law by means of the Rule of Law Worldwide Governance Indicator (RL, sourced from the World Bank). The RL indicator captures the quality of the legal system and, in particular, the degree to which it protects private rights (such as contractual ones) against

encroachment by the state. The RL indicator covers over 200 countries from 1996 to 2013, and ranges from -2.5 to 2.5 with higher values indicating better governance (see Kaufmann, Kraay and Mastruzzi, 2010, for details on the methodology). While this measure is by no means free from criticism (e.g., Ginsburg, 2011), it is probably the most thoroughly vetted and commonly used proxy for the quality of a legal system (Rowher, 2009; Davis, 2014). Values for RL in 2012 and 2013 for our Eurozone countries range from 0.357 (Italy in 2013) to 1.943 (Finland in 2012). We create the variable $High\ Rep_{c,t}$ which takes a value of one if RL is above its median value of RL in year $t-1$ across our sample countries, and zero otherwise.[14] We then estimate the following:

$$y_{i,c,t} = \alpha + \beta_0 CAC_i + \beta_1 CAC_i \times Risk_{c,t} + \beta_2 CAC_i \times High\ Rep_{c,t} + \beta_3 CAC_i \times Risk_{c,t} \times High\ Rep_{c,t} + \gamma X_{i,c,t} + \theta_i + \varepsilon_{i,c,t} \quad (3)$$

where the vector $X_{i,c,t}$ includes variables common to all countries, the direct effects of $Risk_{c,t}$ and $High\ Rep_{c,t}$, and their interaction as country-level variables, and the same bond-specific variables as before. Our interest is in the net effect of CAC provisions on bond yields, which we allow to differ across both country creditworthiness and quality of law. For a low quality of law country, this effect is given by:

$$\beta_0 CAC_i + \beta_1 CAC_i \times Risk_{c,t}$$

while for a high quality of law country is:

$$(\beta_0 + \beta_2) CAC_i + (\beta_1 + \beta_3) CAC_i \times Risk_{c,t}$$

Regression results are shown in the first four columns of Table 5. Consistent with the evidence of Tables 3 and 4, we find that bond yields are positively associated with Eurozone macro-variables ($y_{EU,t}$ and $VSTOXX_t$), country- and bond-level risk (duration or augmented duration), while liquidity measures are insignificant. The quality of law does not impact bond yields directly. In countries with low quality of law, CAC provisions are not associated with wedges in bond yields – regardless of the issuer's credit quality. However, the negative sign of the triple interaction term reveals that, as sovereign creditworthiness deteriorates, CAC bonds trade at lower yields in

[14] Although in principle one may observe countries switching group from one year to the next, the sorting produced by the RL indicator is time-invariant. This is not very surprising in light of the problems of using corruption indexes in time-series (Rowher, 2009).

countries with high quality of law. The net effect of CAC provisions is plotted in Panel A of Figure 6 across the rating spectrum, separately for low and high quality of law countries, when using time fixed effects and augmented duration as a proxy for bond-level risk.[15] As the figure reveals, the yield reduction for CAC bonds is significantly different from zero only for those countries with high quality of law, and countries with worse ratings enjoy larger reductions.

As an alternative proxy for the RL indicator, we employ the Corruption Perceptions Index (CP, sourced from Transparency International).[16] This measure, also a widely used one, is different from the RL indicator we utilized above because that variable was specifically targeted at measuring the quality of the legal system. The CP index gets at a more general question – the degree of corruption in the public sector (which includes the legal system) (Rowher, 2009). We use CP values for the years 2013 and 2014 to identify countries with high reputation of law as those with CP value above its median in year *t*. The sorting based on CP is similar to that based on RL with the exception of two countries: Belgium has CP (resp., RL) values above (resp., below) the median, and Austria has CP (resp., RL) values below (resp., above) the median. Regression results and the net effect of CACs are aligned to those obtained using the RL indicator (see columns 5-8 in Table 5 and Figure 6-Panel B).

In summary, the evidence on the interplay between CAC provisions and the quality of law continues to be consistent with the pro-creditor view of the Euro CAC initiative, with one important additional insight – the relevance of legal risk premia in domestic law bonds. CAC bonds trade at lower yields only in countries with strong legal systems where investors can be reassured that the new provisions will effectively be implemented.

IV.c. CAC Provisions and the Cost of Funding

We have so far documented that, from the perspective of debtor countries, local law bonds with CAC provisions are cheaper (higher prices, or equivalently, lower yields) than matched no-CAC bonds, and especially so under good legal systems. In light of the policy debate at the time of the Euro CACs introduction, this suggests that the new provisions do act as a commitment to avoid a

[15] Results in terms of the net effect of CACs using Eurozone macro-variables and/or duration are similar and thus unreported for reasons of space.

[16] As part of its panoply of governance indicators, the World Bank also has a measure of corruption. However we decided to use the Transparency International measure, because it is an alternative and respected measure and it is arguably less vulnerable to the kinds of political pressures that World Bank staffers are sometimes rumored to being subject to.

Greek-style retroactive change in domestic law in the future. We now turn to address the second view on the Euro CAC initiative, according to which creditors of Eurozone countries were now forewarned (and worried) that they could be restructured. If this was the case, the Euro CAC initiative would be accompanied with heightened concerns of "restructuring" risk, increasing the overall cost of funding. To quantify this effect, we cannot simply compare yields of CAC and no-CAC bonds before and after the Euro CACs introduction because CAC bonds did not exist before January 1, 2013. Moreover, although in principle we could compare yields of our matched no-CAC bonds before and after January 1, 2013, any conclusion from such analysis may be subject to concerns that these bonds were chosen to "replicate" CAC bonds as close as possible in terms of residual maturities as we previously explained in Section III.

We therefore compare yields before and after the introduction of the Euro CAC initiative for the samples of matched and random no-CAC bonds. Recall from Section III, that bonds in both samples are no-CAC local law bonds issued before 1 Jan, 2013 that mature after 1 Jan, 2013. Figure 7 displays the evolution during 2011-14 of average yields (net of the yield on the 8YR Euro area government bond for AAA issuers),[17] in the two samples: We consider equal weighting in the left panel, while we weight bond yields by their outstanding amount in the right panel. Figure 7 offers a number of considerations. First, before the mandated introduction of CAC provisions, average yields in both groups tend to co-move. Second, and more important for our goal, both samples witness a decrease in average yields after January 2013.

Table 6 reports descriptive statistics of bond-level variables for random and matched bonds, with the before and after the Euro CAC initiative split. Random bonds have lower yields, lower durations, and are more liquid (larger amount outstanding and narrower bid-ask spreads) during both sub-periods, consistent with the statistics reported in Table 2 for the entire period. Comparing the two sub-periods reveals that, after January 1, 2013, average yields in each group of bonds are halved relative to the period 2011-12.

To investigate to what extent this reduction is associated with changes in our control variables (e.g., country- and bond-risk) or with the inclusion of CAC provisions, we conduct a difference-in-difference analysis of bond yields using both the matched and the random samples. Based on Figure

[17] We consider the yield at 8 year because the average residual maturity of random and matched no-CAC is 8.41 years in our panel dataset.

7, this analysis is appropriate as yields in both samples have similar trends before the event of our interest. We therefore estimate for the period January 2011 to December 2014 the following model:

$$y_{i,c,t} = \alpha + \beta_0 Matched_i + \beta_1 After_t + \beta_2 Matched_i \times After_t + \gamma X_{i,c,t} + \theta_i + \varepsilon_{i,c,t} \quad (4)$$

where $Matched_i$ is an indicator for the matched sample and $After_t$ is an indicator for the period after the Euro CAC initiative, and the vector $X_{i,c,t}$ includes the control variables we used in specification (1) except for the time fixed effects – including them would prevent us from identifying the *After* indicator (as well as its interaction with *Matched*). To mitigate any potential endogeneity concerns related to the use of Eurozone macro-level control co-variates, we also run regressions after instrumenting these variables with their US counterparts. Specifically, we first project $y_{EU,t}$ (resp., $VSTOXX_t$) onto the 10YR US benchmark (log-)yield (resp., the VIX index) and then use the predicted values from these first-stage regressions, $\hat{y}_{EU,t}$ and $\widehat{VSTOXX}$, in specification (3) as a second alternative to our Eurozone controls. The coefficients of interest are β_1 and $\beta_1 + \beta_2$ which capture, respectively, the yield change in random and matched bonds after January 1, 2013.

Table 7 reports regression results for different choices of macro-level variables (Eurozone/instrumented Eurozone) and bond-level risk (duration/augmented duration). The sign and significance of explanatory variables are in line with findings in Table 3 – note that, with this longer sample, we also have that yields are positively associated with the bid-ask spread. Moreover, we confirm that augmenting duration by convexity increases model explanatory power. The coefficient β_0 is insignificant in all specifications, which certifies that average yields between the two samples are not different before January 1, 2013. Columns 1 and 2 in Table 7 show that, when using Euro area proxies for general movements in sovereign yields and market volatility, yields on both samples of bonds are not significantly different after the introduction of the Euro CAC initiative. According to the last two columns – those with instrumented Eurozone variables – the introduction of mandatory CAC provisions lowers yields on all bonds, although more so for random bonds. In terms of economic magnitude, the estimated coefficients in these two columns imply that yields on random (resp., matched) bonds would be, relative to their pre-2013 average levels, 146-152 bps (resp., 106-112 bps) lower after January 1, 2013.

In sum, the evidence in Table 7 fails to detect an increase in the overall cost of funding after January 1, 2013. Thus, we do find support for the conjecture that the inclusion of CACs would increase restructuring risk for Euro area sovereign debtors.

V. Reopening of Old Issuances

Our main results on the inclusion of CAC provisions highlight the benefits of orderly restructuring, while the costs related to governments' opportunistic behaviour seem limited. In this respect, although the introduction of CAC provisions is exogenously mandated by the Euro CAC initiative for all new issuances after January 2013 with maturity larger than one year, the very same initiative allows governments to reopen ("tap") pre-2013 issuances (i.e., bonds without CACs) up to a certain limit.[18]

Although the intended goal for allowing tapping of pre-2013 bonds was to preserve market liquidity, sovereigns may exploit this possibility to dilute the inclusion of CAC provisions in their local law bonds. One way to see if this was the case is to ascertain whether the issuance activity of CAC bonds after January 1, 2013 is different from the issuance activity of no-CAC bonds before that date. We therefore compare the outstanding amount of our CAC bonds (issued in the period January 1, 2013 to June 30, 2014) with those from the matched and random no-CAC samples that were issued between January 1, 2011 and June 30, 2012 (henceforth "Benchmark sample", including 36 bonds).

To illustrate our samples, we first plot the time-series of the outstanding amount (issued and tapped) in the benchmark sample in Figure 8. Comparing this with the outstanding amount of CAC bonds in Figure 2 suggests that the issuing/tapping behaviour for bonds in the benchmark sample during 01/2011-06/2012 is fairly similar to that for CAC bonds during 01/2013-06/2014. At the end of June 2014, the total amount outstanding of CAC bonds is 865.7 € bln out of which 534.6 € bln is tapped, and at the end of June 2012, the total amount outstanding of bonds in the benchmark sample is 326.5 € bln out of which 201.3 € is tapped: For both CAC and benchmark bonds reopening existing securities represents about 60% of total amount outstanding.

In order to formally investigate differences in the outstanding amount of bonds between the two samples, we estimate the following specification:

$$Size_{i,c,t} = \alpha + \beta CAC_i + \gamma X_{i,c,t} + \theta_i + \varepsilon_{i,c,t} \quad (4)$$

[18] The initiative foresees that Eurozone sovereigns are able to reopen pre-2013 securities up to a limited percentage of all bonds issued by that Member State in that year. Such percentage decreases over time, from 45% in 2013 to 5% in 2023 (*see* Sub Committee Explanatory Note on Collective Action Clauses (2012), *available at* http://europa.eu/efc/sub_committee/pdf/supplemental_explanatory_note_on_the_model_cac_-_26_march_2012.pdf).

where $Size_{i,c,t}$ is the log of outstanding amount (in Euro mln) and CAC_i takes a value of one for CAC bonds and zero for bonds in the benchmark sample.[19] Here the vector $X_{i,c,t}$ includes week-of-the-year fixed effects to control for (within the year) seasonality common to all countries, country fixed effects to control for different (time-invariant) financing needs of countries, and the log-difference (in weeks) between week *t* and the week of issuance of bond *i* ($Age_{i,c,t}$). What justifies the inclusion of this latter variable is the observation that bonds are reopened as time goes by, thus increasing bond size.

Regression results are presented in Table 8: Bond size increases with bond age and the CAC indicator is not significant. These findings continue to hold if we add $Age^2_{i,c,t}$ to capture potential non-linearities in the relation between a bond's age and its outstanding amount. We conclude that there are no systematic differences between the issuance activity of CAC bonds and no-CAC bonds in the benchmark sample.

VI. Accounting for (Unconventional) Monetary Policy

We now investigate whether, and to what extent, unconventional monetary policy can affect our results on the price impact of CACs. Indeed, in the aftermath of the 2007 financial crisis, central banks around the world have implemented unconventional policy measures to contain financial instability, some of which have explicitly targeted government debt securities. During our sample period, which includes what commentators usually refer to as the "European sovereign debt crisis", the ECB has implemented the Securities Markets Programme (SMP) until September 2012 and then replaced it with the Outright Monetary Transactions (OMT). To the extent that these interventions affect bond yields in the same way, and act through our macro-level variables, then we are on the safe ground in that we have already controlled for these in our regressions.

One concern is therefore whether our results are robust to unconventional monetary policy measures, should they affect bond yields differently in the cross-section of countries reflecting asymmetric implementation. Under the SMP, the ECB has purchased about €220 bln of bonds issued by Greece, Ireland, Italy, Portugal, and Spain from 2010 to early 2012. These large-scale asset purchases have successfully driven down yields (as well as their volatility) of the countries

[19] We make use of the outstanding amount of CAC (resp. benchmark) bonds until December 2014 (resp. December 2012), in line with the two-year time span we used in our previous analyses using CAC and matched no-CAC bonds.

under the programme, with reduction ranging from –1 to –2bps (Italy) up to –17 to –21bps (Greece) per €1 bln of bond purchases (Eser and Schwaab, 2016; Ghysels et al., 2016). Similarly, although the OMT have never been deployed, their announcement was successful in lowering bond yields in Italy and Spain while leaving yields on French and German bonds largely unaffected (Altavilla, Giannone and Lenza, 2014). Overall, the empirical evidence on the ECB (unconventional) monetary policy is suggestive that yields on sovereign bonds issued by different countries react differently to these policy instruments.

We first reconsider our results on the yield differential between CAC and matched no-CAC bonds. We define the indicator variable $G_{c,t}$ as taking value of one if country *c* during week *t* belongs to a given group, and zero otherwise; then, we augment specification (1) with $G_{c,t}$ and its interaction with the (set of) macro-variables, $G_{c,t}X_t$. We adopt four different country groupings. The first two sorts are based on our variable $HighRep_{c,t}$, which equals one for countries with Rule of Law (or Corruption Perceptions) indicator above median value in the cross-section of countries. Third, we set $G_c = 1$ for Ireland, Italy, Portugal and Spain. Fourth, we group countries into high (resp., low) risk depending on whether country rating in week *t* is above (resp., equal or below than) the median rating. This last grouping produces a time invariant sort with Slovenia and Slovakia (plus (G)IIPS) classified as high risk countries. For each country sort we re-run the specifications of Table 3 and report in Table 9 the coefficient on the CAC indicator. Regardless of the country grouping we adopt, the sign and magnitude of the CAC indicator remain consistent with that of our baseline specification.

Then we turn to our findings on the cross-country differences in yields between CAC and matched no-CAC bonds. First, we reconsider our results on the interplay between the yield differential and issuers' credit quality. For reasons of space, we focus on specification (2) using time fixed effects and augmented duration as a measure of bond risk – results using Eurozone variables and/or duration are qualitatively similar. For a given country sort, we augment specification (2) with this sort and its interaction with time fixed effects, and report in Table 10-Panel A the net effect of CACs evaluated at the country ratings in our sample. To ease comparability, we include in the first column the net effect without interactions (see Table 4-column 4 and Figure 5-Panel B). As the table indicates, the net effects of CAC provisions of this baseline case are essentially unchanged. Second, we address the robustness of our findings on the dependence of the yield differential on the quality of the legal system. Recall from Section IV.b that we identify countries with high quality of law in two complementary ways, using sorts based on either the RL or the CP indicator. The

baseline here is specification (3) with time fixed effects, augmented duration, and the quality of law measured by the RL indicator – again, results are robust to using Eurozone variables, duration, and/or the CP indicator. Column 1 in Table 10-Panel B reports the effects of CACs across the rating spectrum for this baseline – these as the ones we plot in Figure 6-Panel A. We first add to specification (3) the interaction between *HighRep* (based on RL) and the week fixed effects. Then, we alternatively add the (G)IIPS (resp., *HighRisk*) indicator as well as its interaction with week fixed-effects. Again, regardless of the country sort we use, we document that the countries for which CAC bonds trade at much lower yields compared to matched no-CAC bonds are those with good reputation of law and relatively weak creditworthiness.

Finally, we turn to our results on the overall cost of funding allowing yields in different countries to react differently to macro-variables. We augment specification (4) with the country grouping indicator $G_{c,t}$ and its interaction with the (set of) macro-variables, $G_{c,t}X_t$. In Table 11 we report the coefficients for yield changes in random ($After_t$) and matched no-CAC bonds ($After_t + Matched_i$ $After_t$). Again, regardless of the country grouping we adopt, we document that yields for both types of bonds have either decreased or are unaffected after the Euro CAC initiative.

VI. Conclusion

In this paper we have exploited the Euro Collective Action Clause (CAC) initiative to obtain clearer results on a challenging question in law and finance: Are bond contract terms priced? The Euro CAC initiative mandates the inclusion, as of January 2013, of a single contract term, i.e., the CAC, in Eurozone sovereign bonds with maturity above one year. This constitutes an ideal experiment to ask the pricing question because it meets a series of conditions that are rarely met jointly. First, it allows us to isolate the impact of a new specific term, while contracts are often amended in various dimensions. Second, the change in contract terms is exogenous to the contract issuers. Third, the initiative enables us to compare contracts with the new clause(s) with others that are otherwise identical. Fourth, it is a major policy scheme that affects the largest segment of the global sovereign debt market.

Around the time of the policy move, policy makers indicated what they hoped the result of the initiative would be. Some foresaw the initiative as sending the markets a clear message that future restructurings would be orderly, predictable and rule based (unlike that of Greece in March 2012, where CACs had to be retrofit at the last minute). Others expected that CACs would make

restructurings more likely in the future. Our findings suggest that markets took the former, rather than the latter, message: Bonds with CAC provisions trade at lower yields than comparable bonds without provisions, and sovereign yields have not increased after January 1, 2013.

The data generated by the Euro CAC initiative enables us to further understand how contract terms and the underlying legal system interact. The value of a contract term depends on how a court interprets it and what kinds of mechanisms the court can apply to enforce it. Legal systems vary quite considerably on matters such as contract interpretation and enforcement; and particularly so when the defendant in question is the state itself. We have identical CACs that were inserted at the same time in bonds under multiple legal systems, so we can compare the pricing effects across legal systems – something that prior researchers were unable to do because they looked at CAC provisions in bonds issued under foreign law. Our results indicate that the value of contract terms does vary as a function of the quality of the legal system within which they are going to be applied.

We believe our paper takes some steps in the direction of providing answers to the question of how financial markets evaluate the impact of specific contract terms and how such impact interacts with the quality of the legal system. One further dimension relevant for future research is the interplay between the price impact of contract terms and holders. In relation to sovereign bonds, for example, CACs facilitate restructurings by specifying a qualified majority (instead of unanimity) of creditors required to modify payment terms. Therefore, while it is very simple to hold out in a bond requiring unanimity – it just takes one unit of the bond – the question of how difficult (or easy) it is to build up a blocking position in a bond with CACs requires careful evaluation. On the one hand, as the Argentina's recent experience in the *NML v. Argentina* case teaches us, there are there are investors out there that are looking for holdout positions and get rewarded for this (Choi, Gulati and Scott, 2017). On the other hand, the intervention of public authorities – think about Quantitative Easing – may affect costs and benefits of building up blocking positions. A deeper look at this question requires fine-grained information on "who holds what" (and when).

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Warga, Arthur, 1992, Bond Returns, Liquidity, and Missing Data, 1992, *Journal of Financial and Quantitative Analysis*, 27(4), 605-617.

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.

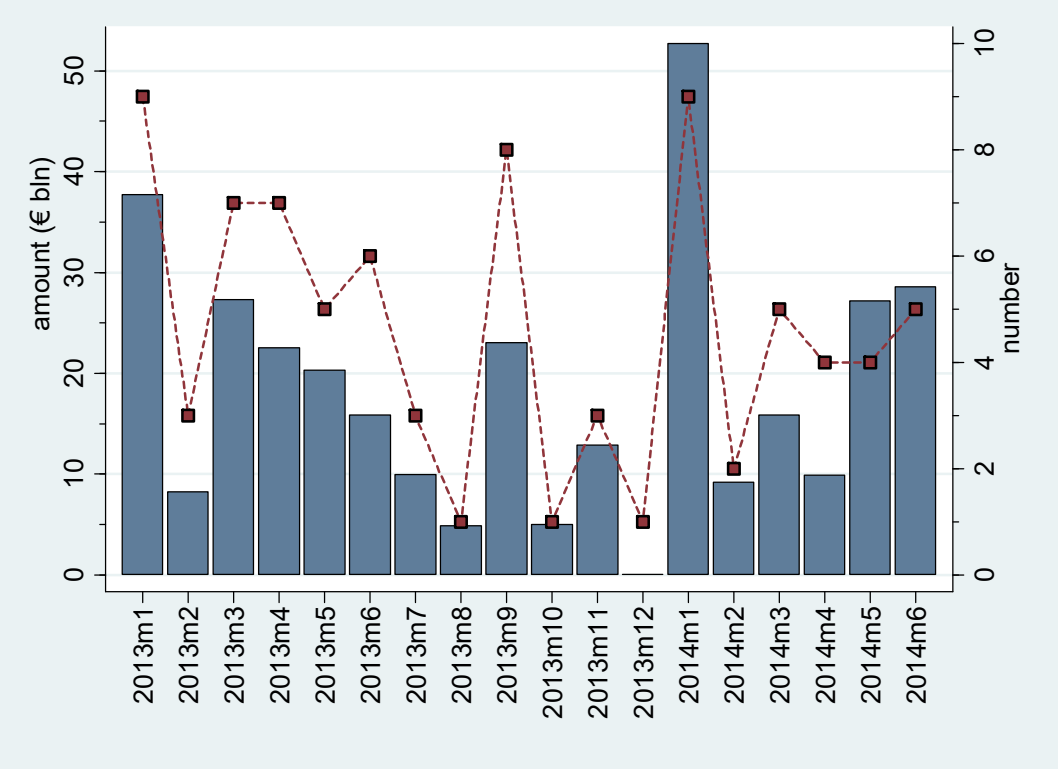


Figure 2. CAC bonds outstanding. Monthly time series of CAC bonds outstanding by aggregate amount (bars, left vertical axis) and by fraction of total long-term government outstanding (red squares, right vertical axis). Amount outstanding is split between amount issued (red bars) and amount reopened (blue 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.

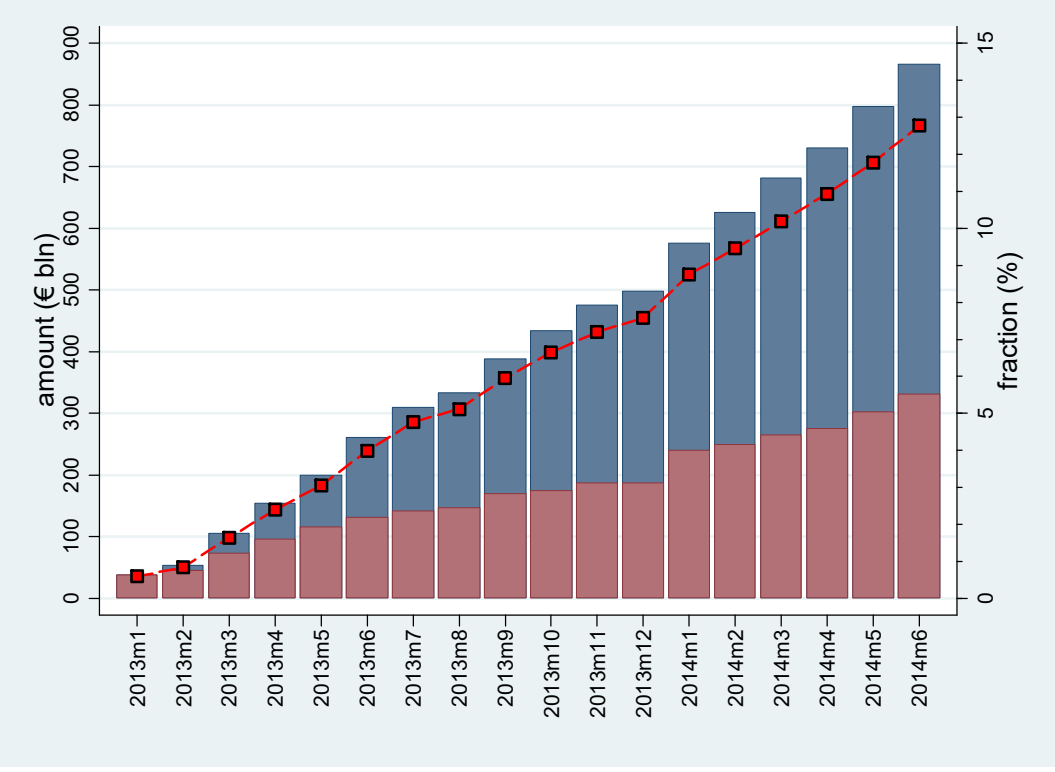


Figure 3. Maturity differential between CAC and matched no-CAC bonds. Histogram of the distance (in absolute value) between CAC and matched no-CAC bonds, expressed in months. CAC bonds are identified as Euro-denominated zero-coupon or fixed coupon bonds issued under local law by 13 Eurozone countries 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.

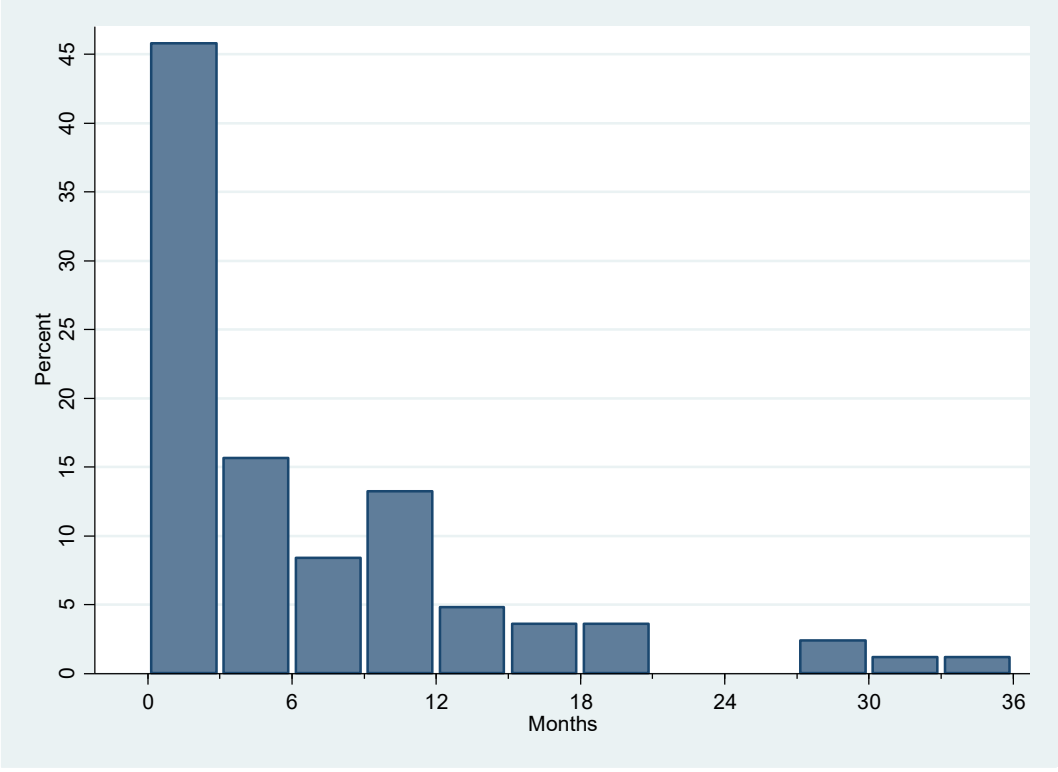


Figure 4. CAC provisions and yield differentials, over time. Point estimates (dashed blue line) together with their four-weeks moving average (solid red line) of the effect of CAC provisions on yields. The sample ranges from February 25, 2013 to December 30, 2014. The point estimates are for the CAC indicator from cross-sectional regressions of weekly log-yield on country risk and a series of bond-level controls (augmented duration, size, and bid-ask spread). Definitions of the explanatory variables are provided in Table A1. The horizontal solid grey line corresponds to the average of these point estimates; the horizontal dash-dot grey lines correspond to the 95% confidence interval, computed using a Newey-West correction with four lags.

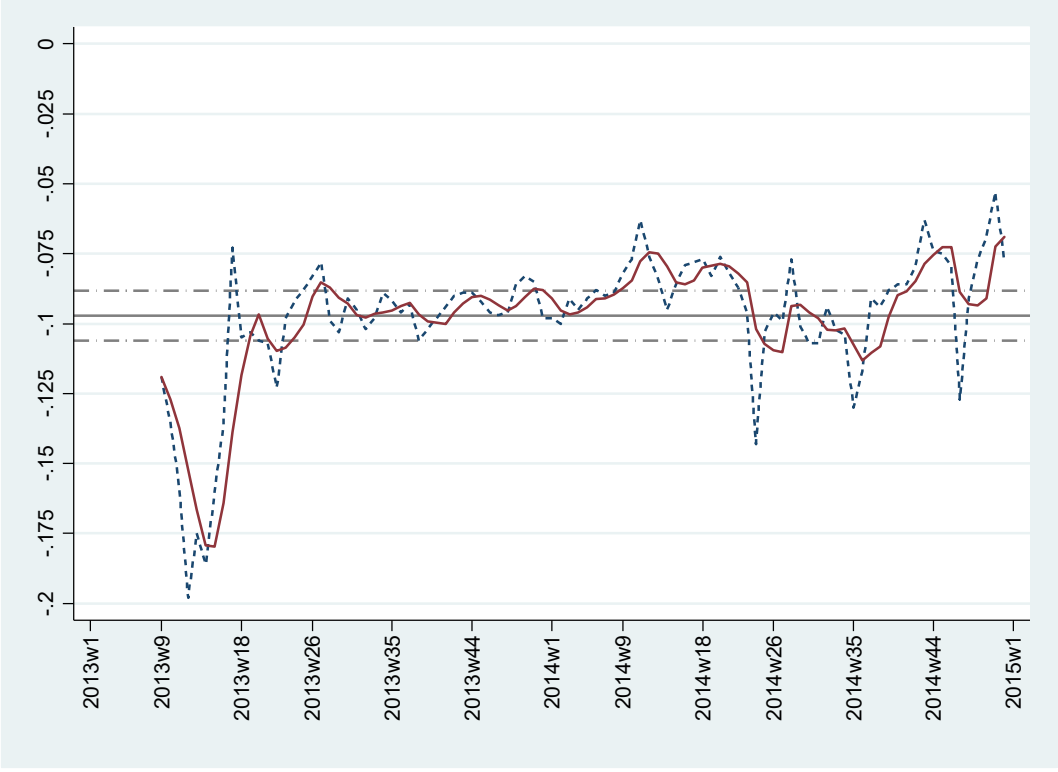


Figure 5. Country risk and the net effect of CAC provisions. This figure plots the estimated net effect of CAC provisions on bond yields along the rating spectrum, together with its 95% confidence interval. Panel A (resp., B) plots the effect for column 2 (resp., 4) in Table 4.

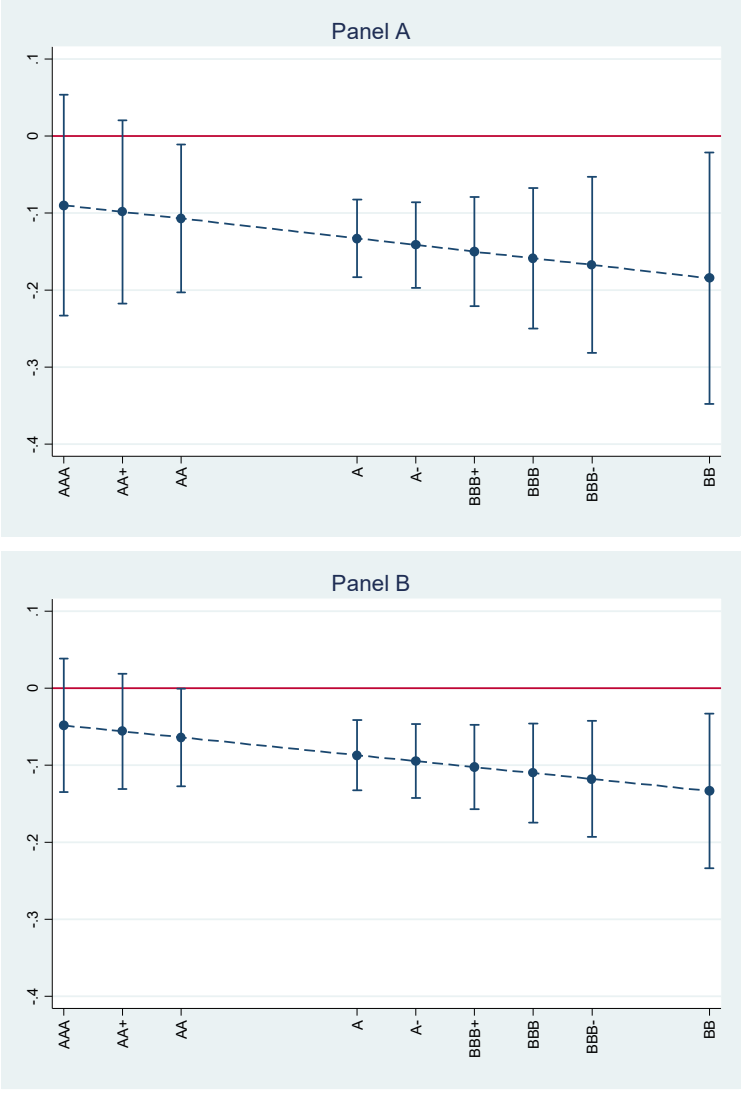


Figure 6. Country risk, quality of law, and the net effect of CAC provisions. This figure plots the estimated net effect of CAC provisions on bond yields along the rating spectrum for low (left panel) and high (right panel) quality of law countries, together with its 95% confidence interval. Quality of law is based on the Rule of Law indicator (Panel A) or on the Corruption Perceptions index (Panel B). Panel A (resp., B) shows the net effect corresponding to column 4 (resp., 8) in Table 5.

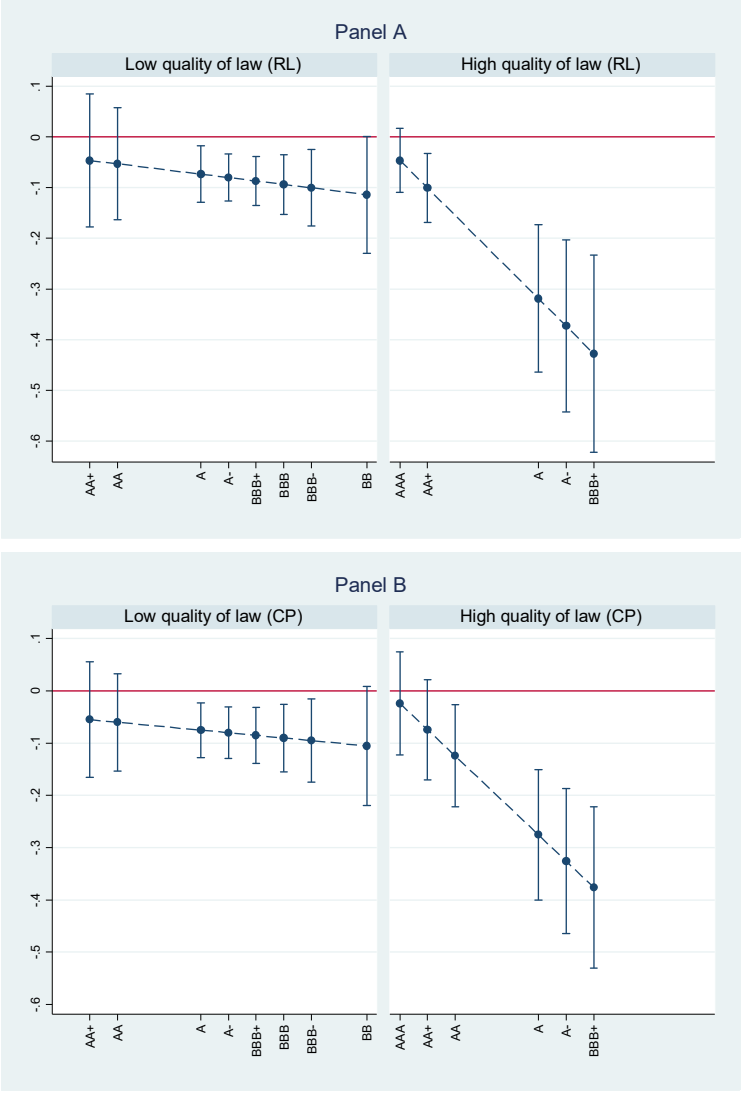
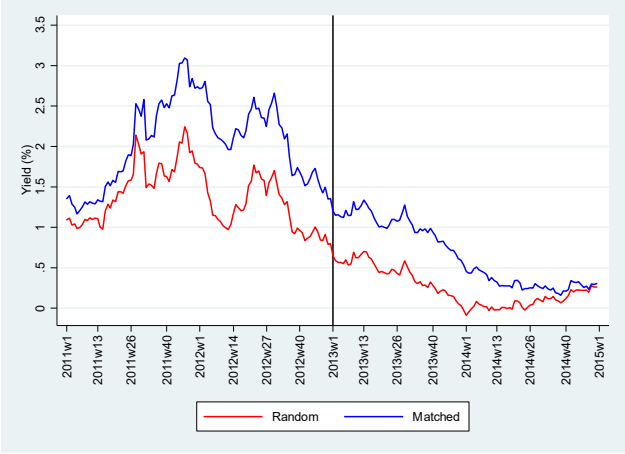


Figure 7. Cost of funding, over time. This figure plots the time series of average yields for selected samples of bonds. "Matched" and "Random" refer to local law no-CAC bonds issued before January 1, 2013 with maturity after January 1, 2013. Average yields in the left (resp., right) panel are simple averages (resp., weighted by the amount outstanding) in excess of the 8YR Euro area government yield for AAA issuers.



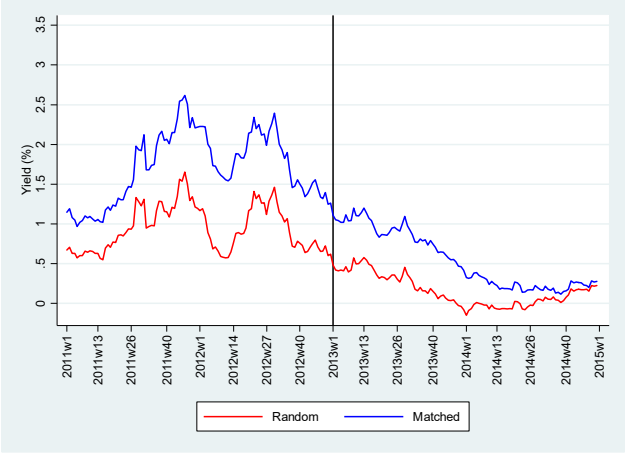


Figure 8. No-CAC bonds outstanding (benchmark sample). Monthly time series of no-CAC bonds outstanding by aggregate outstanding amount (amount issued, red bars, and amount reopened, blue bars, left vertical axis) and by number of bonds (red squared, right vertical axis). Bonds in the benchmark sample are extracted from the sample of random and matched no-CAC bonds as those issued between January 1, 2011 and June 30, 2012.

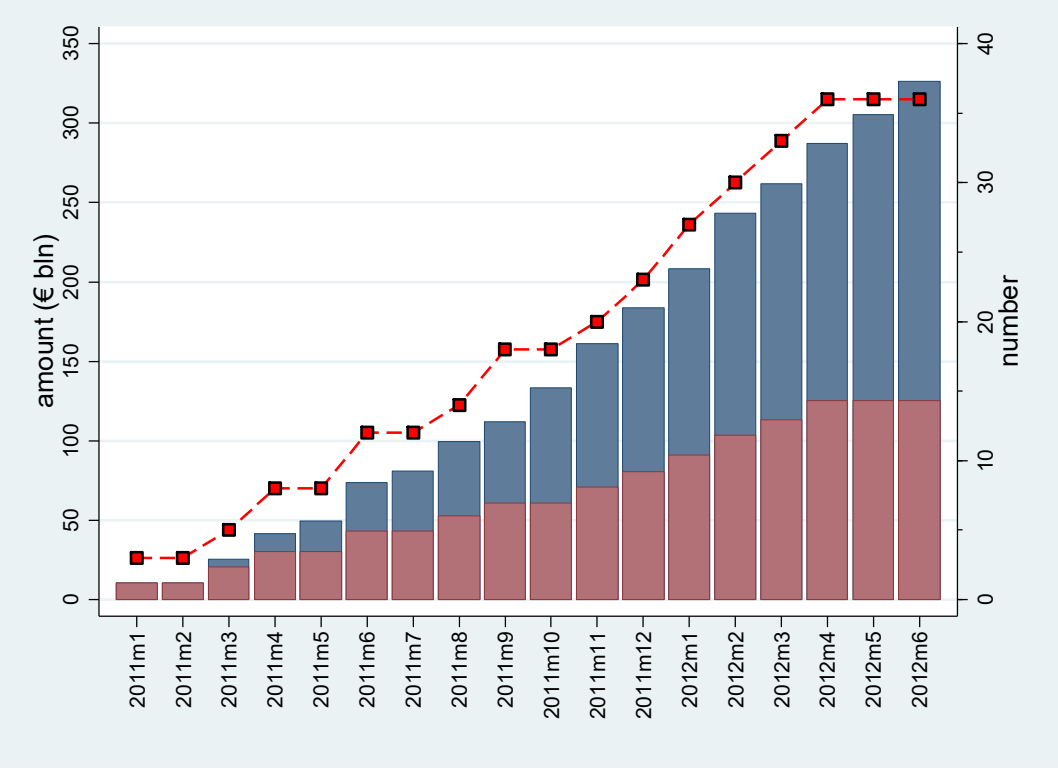


Table 1. Data filtering and country representativeness. This table describes the country breakdown of bonds at each stage of our data construction process. "Initial" refers to Euro-denominated zero-coupon or fixed coupon bonds issued by national governments in the Eurozone between January 1, 2013 and 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. The last column reports the country breakdown of 83 bonds randomly sampled (without replacement) from the pool of no-CAC bonds issued before January 1, 2013 and maturing after January 1, 2013.

Issuer	Initial	CAC provisions	Local law	CAC & Matched no-CAC	Random no-CAC
Austria	4	4	4	4	3
Belgium	16	13	13	13	10
Cyprus	7	7	5	-	-
Finland	3	3	3	3	3
France	10	10	10	10	12
Germany	5	5	5	5	11
Ireland	2	2	2	2	6
Italy	18	18	18	18	16
Luxembourg	2	2	2	1	-
Malta	10	9	-	-	-
the Netherlands	5	5	5	5	6
Portugal	6	6	5	5	2
Slovakia	4	4	4	4	4
Slovenia	4	4	3	3	1
Spain	10	10	10	10	9
Total	**106**	**102**	**89**	**83**	**83**

Table 2. Sample overview CAC and no-CAC bonds (bond-level variables). This table presents means, medians, 5th and 95th percentiles for our samples of CAC, matched no-CAC, and random no-CAC bonds. Matched no-CAC bonds have maturities as close as possible to those of CAC bonds, while random bonds are randomly chosen from the pool of no-CAC bonds. In Panel A, 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. In Panel B, maturity is computed at issuance. Descriptive statistics for maturity are computed in the cross-section (83 bonds in each sample); for other variables are computed in the panel. The time period in Panel A (resp., Panel B) ranges between January 1, 2013 (resp., January 1, 2011) and December 30, 2014. The last column reports the difference in means between matched no-CAC and CAC bonds (Panel A) and matched no-CAC and random no-CAC bonds (Panel B) together with the t-test statistical significance. ***, **, and * denote statistical significance at the 1%, 5%, and 10% level, respectively.

Panel A

Variable (unit)	**CAC bonds** (N=5,476)				**Matched no-CAC bonds** (N=5,476)				Diff.
	Mean	Median	5th Pct.	95th Pct.	Mean	Median	5th Pct.	95th Pct.	
Yield (%)	1.650	1.450	0.207	3.995	1.668	1.419	0.206	4.034	0.018
Duration (yrs)	6.136	6.510	0.976	12.038	5.804	5.810	0.997	11.156	-0.332***
Amount (€mln)	9801.3	9126.3	5.7	21185.8	13101.9	13598.3	22.3	28068.4	3300.6***
BA Spread (%)	0.138	0.045	0.013	0.649	0.162	0.049	0.014	0.837	0.024***
Maturity (yrs)	7.644	7.545	1.496	15.789	7.649	7.290	2.003	15.493	0.006

Panel B

Variable (unit)	**Random no-CAC bonds** (N=15,197)				**Matched no-CAC bonds** (N=15,292)				Diff.
	Mean	Median	5th Pct.	95th Pct.	Mean	Median	5th Pct.	95th Pct.	
Yield (%)	2.610	2.184	0.133	6.498	3.047	2.596	0.403	6.547	0.436***
Duration (yrs)	6.478	5.152	0.964	16.025	6.652	6.682	1.870	11.454	0.174***
Amount (€mln)	14070.2	14122.2	150	29871	13017.3	13311.5	46.4	28789	-1052.9***
BA Spread (%)	0.283	0.109	0.013	1.144	0.343	0.122	0.017	1.678	0.060***
Maturity (yrs)	13.940	10.307	2.959	31.858	13.592	10.682	4.997	30.975	-0.348

Table 3. CAC provisions and yield differentials. This table presents random (bond-level) effects 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). The dependent variable is weekly log-yield. Definitions of the explanatory variables are provided in Table A1. Standard errors are clustered at the country level. ***, **, and * denote statistical significance at the 1%, 5%, and 10% level, respectively.

	(1)	(2)	(3)	(4)
CAC	-0.126***	-0.130***	-0.081***	-0.085***
	(0.021)	(0.021)	(0.018)	(0.019)
y_{EU}	1.365***	1.349***		
	(0.127)	(0.126)		
VSTOXX	0.024***	0.023***		
	(0.006)	(0.006)		
Duration	0.361***		0.234***	
	(0.041)		(0.026)	
Duration(Aug)		0.403***		0.260***
		(0.041)		(0.027)
Size	-0.035	-0.035	-0.023	-0.024
	(0.028)	(0.028)	(0.023)	(0.022)
Bid-Ask Spread	0.098	0.093	0.005	-0.000
	(0.169)	(0.166)	(0.121)	(0.121)
Risk	0.103***	0.109***	0.124***	0.129***
	(0.032)	(0.032)	(0.016)	(0.015)
Week FE	NO	NO	YES	YES
Obs	10,952	10,952	10,952	10,952
# bonds	166	166	166	166
R-overall	0.615	0.625	0.745	0.757

Table 4. CAC provisions and yield differentials: country risk. This table presents random (bond-level) effects regression results to examine the effect of issuer risk 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). The dependent variable is weekly log-yield. Definitions of the explanatory variables are provided in Table A1. The bottom part of the table shows the net effect of CAC provisions for selected country ratings. Standard errors are clustered at the country level. ***, **, and * denote statistical significance at the 1%, 5%, and 10% level, respectively.

	(1)	(2)	(3)	(4)
CAC	-0.071	-0.081	-0.031	-0.041
	(0.107)	(0.086)	(0.052)	(0.051)
y_{EU}	1.365***	1.348***		
	(0.127)	(0.126)		
VSTOXX	0.024***	0.023***		
	(0.006)	(0.006)		
Duration	0.362***		0.234***	
	(0.041)		(0.026)	
Duration(Aug)		0.403***		0.260***
		(0.041)		(0.027)
Size	-0.035	-0.034	-0.022	-0.024
	(0.029)	(0.028)	(0.023)	(0.023)
Bid-Ask Spread	0.098	0.093	0.005	-0.001
	(0.169)	(0.166)	(0.122)	(0.121)
Risk	0.107***	0.113***	0.129***	0.133***
	(0.035)	(0.035)	(0.015)	(0.016)
Risk×CAC	-0.010	-0.009	-0.009	-0.008
	(0.014)	(0.013)	(0.008)	(0.008)
Week FE	NO	NO	YES	YES
Obs	10,952	10,952	10,952	10,952
# bonds	166	166	166	166
R-overall	0.614	0.625	0.745	0.757
Net effect of CAC at rating =				
AAA	*-0.080*	*-0.090*	*-0.039*	*-0.048*
	(0.074)	*(0.073)*	*(0.045)*	*(0.044)*
A	*-0.129****	*-0.133****	*-0.084****	*-0.087****
	(0.025)	*(0.026)*	*(0.023)*	*(0.023)*
BB	*-0.187***	*-0.185***	*-0.137****	*-0.133****
	(0.085)	*(0.083)*	*(0.052)*	*(0.051)*

Table 5. CAC provisions and yield differentials: country risk and quality of law. This table presents random (bond-level) effects regression results to examine the effect of issuer risk 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). The dependent variable is weekly log-yield. High Rep in columns 1-4 is based on the Rule of Law Indicator (source: World Bank) and in columns 5-8 is based on the Corruption Perceptions Index (source: Transparency International). Definitions of the explanatory variables are provided in Table A1. Standard errors are clustered at the country level. ***, **, and * denote statistical significance at the 1%, 5%, and 10% level, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
CAC	-0.085	-0.091	-0.024	-0.033	-0.096	-0.106	-0.037	-0.045
	(0.122)	(0.122)	(0.091)	(0.090)	(0.160)	(0.160)	(0.075)	(0.076)
y_{EU}	1.353***	1.336***			1.351***	1.334***		
	(0.125)	(0.124)			(0.125)	(0.123)		
VSTOXX	0.024***	0.023***			0.024***	0.023***		
	(0.006)	(0.006)			(0.006)	(0.006)		
Duration	0.372***		0.239***		0.367***		0.236***	
	(0.040)		(0.026)		(0.041)		(0.025)	
Duration(Aug)		0.415***		0.265***		0.409***		0.262***
		(0.040)		(0.027)		(0.042)		(0.027)
Size	-0.025	-0.024	-0.019	-0.021	-0.048	-0.048	-0.030	-0.032
	(0.027)	(0.026)	(0.025)	(0.024)	(0.030)	(0.029)	(0.029)	(0.028)
Bid-Ask Spread	0.099	0.093	0.008	0.003	0.097	0.091	0.004	-0.002
	(0.170)	(0.167)	(0.123)	(0.122)	(0.169)	(0.166)	(0.122)	(0.121)
High Rep	-0.083	-0.083	0.061	0.068	0.162	0.154	0.232	0.225
	(0.300)	(0.301)	(0.142)	(0.136)	(0.368)	(0.371)	(0.163)	(0.161)
High Rep×CAC	0.073	0.065	0.043	0.041	0.107	0.107	0.075	0.071
	(0.155)	(0.153)	(0.086)	(0.084)	(0.212)	(0.210)	(0.076)	(0.075)
Risk	0.113***	0.119***	0.131***	0.136***	0.119***	0.124***	0.145***	0.145***
	(0.040)	(0.040)	(0.018)	(0.018)	(0.045)	(0.045)	(0.017)	(0.017)
Risk×High Rep	-0.142*	-0.144*	-0.070	-0.070	-0.145*	-0.146*	-0.072*	-0.072*
	(0.081)	(0.080)	(0.052)	(0.051)	(0.078)	(0.076)	(0.039)	(0.038)
Risk×CAC	-0.003	-0.002	-0.008	-0.007	-0.001	0.000	-0.006	-0.005
	(0.017)	(0.017)	(0.012)	(0.012)	(0.020)	(0.020)	(0.010)	(0.010)
Risk×High Rep×CAC	-0.083**	-0.082**	-0.049***	-0.048***	-0.081*	-0.080*	-0.046***	-0.045***
	(0.036)	(0.035)	(0.017)	(0.017)	(0.041)	(0.041)	(0.016)	(0.015)
Week FE	NO	NO	YES	YES	NO	NO	YES	YES
Obs	10,952	10,952	10,952	10,952	10,952	10,952	10,952	10,952
# bonds	166	166	166	166	166	166	166	166
R-overall	0.617	0.628	0.736	0.749	0.615	0.626	0.742	0.755

Table 6. Random and matched no-CAC bonds, before and after January 1, 2013 (bond-level variables). This table presents means, medians, 5th and 95th percentiles for our sample of matched and random (no-CAC) bonds issued before January 1, 2013. Matched bonds have maturities as close as possible to those of CAC bonds, while random bonds are randomly chosen from the pool of no-CAC bonds. Before refers to the time period January 1, 2011-December 30, 2012; After refers to the time period January 1, 2013-December 30, 2014. The last column reports the difference in means between matched and random bonds together with the t-test statistical significance. The last row reports the difference in average yields between before and after the Euro CAC Initiative together with the t-test statistical significance. ***, **, and * denote statistical significance at the 1%, 5%, and 10% level, respectively.

Variable (unit)	**Random bonds**				**Matched bonds**				Diff.
	Mean	Median	5th Pct.	95th Pct.	Mean	Median	5th Pct.	95th Pct.	
	Before (N=7,299)				Before (N=6,851)				
Yield (%)	3.644	3.195	0.499	7.881	4.323	4.006	1.284	8.515	0.678***
Duration (yrs)	6.903	5.706	1.910	14.890	7.288	7.089	2.993	11.741	0.385***
Amount (€mln)	13831.1	13891.0	150.0	29115.0	12995.4	12665.2	79.3	28002.0	-835.7***
BA Spread (%)	0.462	0.188	0.020	2.308	0.533	0.217	0.045	2.509	0.071***
	After (N=7,898)				After (N=8,441)				
Yield (%)	1.654	1.267	0.084	4.758	2.011	1.741	0.271	4.647	0.356***
Duration (yrs)	6.085	4.545	0.544	16.599	6.136	6.131	1.311	11.393	0.051
Amount (€mln)	14291.2	14420.9	150.0	30745.0	13035.2	13646.5	36.3	28789.0	-1256.0***
BA Spread (%)	0.117	0.056	0.011	0.471	0.189	0.060	0.015	0.993	0.072***
Diff. (Yield)	1.990***				2.312***				

Table 7. CAC provisions and the cost of funding. This table presents random (bond-level) effects regression results to examine the relation between the Euro CAC Initiative and bond yields. The sample ranges from January 1, 2011 to December 30, 2014 and includes 166 bonds issued before January 1, 2013 out of which 83 have maturities as close as possible to those of CAC bonds (matched bonds) and 83 are randomly chosen (random bonds). The dependent variable is weekly log-yield. *Matched* is an indicator equal to one for matched bonds, and *After* is an indicator equal to one for the period after January 1, 2013. $\hat{y}_{EU}$ (resp., $\widehat{VSTOXX}$) are predicted values from regressing y_{EU} (resp., $VSTOXX$) on the 10YR US benchmark (log-)yield (resp., the VIX index). Definitions of the other explanatory variables are provided in Table A1. Standard errors are clustered at the country level. ***, **, and * denote statistical significance at the 1%, 5%, and 10% level, respectively.

	(1)	(2)	(3)	(4)
y_{EU}	1.326***	1.297***		
	(0.141)	(0.135)		
VSTOXX	0.014***	0.014***		
	(0.003)	(0.003)		
$\hat{y}_{EU}$			1.127**	1.125**
			(0.538)	(0.525)
$\widehat{VSTOXX}$			0.013***	0.013***
			(0.002)	(0.002)
Duration	0.368***		0.524***	
	(0.039)		(0.066)	
Duration(Aug)		0.425***		0.588***
		(0.040)		(0.068)
Size	0.008	0.006	-0.047	-0.046
	(0.049)	(0.045)	(0.048)	(0.045)
Bid-Ask Spread	0.120**	0.118**	0.187***	0.183***
	(0.056)	(0.055)	(0.061)	(0.060)
Risk	0.150***	0.153***	0.113***	0.118***
	(0.028)	(0.029)	(0.025)	(0.026)
Matched	0.077	0.020	-0.014	-0.085
	(0.199)	(0.201)	(0.295)	(0.294)
After	-0.162	-0.140	-0.541***	-0.511***
	(0.106)	(0.108)	(0.092)	(0.088)
Matched×After	0.249***	0.242***	0.241***	0.230***
	(0.075)	(0.070)	(0.061)	(0.056)
Week FE	NO	NO	NO	NO
Obs	30,489	30,489	30,489	30,489
# bonds	166	166	166	166
R-overall	0.502	0.513	0.332	0.350
After+Matched×After	*0.087*	*0.102*	*-0.300****	*-0.281****
	(0.104)	*(0.106)*	*(0.084)*	*(0.080)*

Table 8. Outstanding amount for CAC and no-CAC bonds. This table presents random (bond-level) effects regression results to examine the relation between CAC provisions and bond size. The sample ranges from January 1, 2013 to December 30, 2014 for 83 bonds issued after January 1, 2013 (CAC bonds), and from January 1, 2011 to December 30, 2012 for 36 bonds issued between January 1, 2011 and June 30, 2012 (benchmark bonds). *Age* is the difference between week *t* and the week of issuance, in logs. Regressions include week-of-the-year fixed effects, and country fixed effects. Standard errors are clustered at the country level. ***, **, and * denote statistical significance at the 1%, 5%, and 10% level, respectively.

	(1)	(2)
CAC	-0.427	-0.447
	(0.548)	(0.539)
Age	0.252***	0.360***
	(0.038)	(0.122)
$(Age)^2$		-0.018
		(0.016)
Obs	11,678	11,678
# bonds	119	119
R-overall	0.536	0.537

Table 9. CAC provisions and yield differentials/Robustness to unconventional monetary policy. This table presents random (bond-level) effects regression results to examine the relation between CAC provisions and bond yields, accounting for heterogeneous (unconventional) monetary policy. 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). The dependent variable is weekly log-yield. The table reports the coefficient on the CAC indicator. "Baseline" refers to the specifications in Table 3. The other rows augment the baseline specification with a country-level indicator variable and its interaction with macro-variables. Definitions of the explanatory variables are provided in Table A1. Standard errors are clustered at the country level. ***, **, and * denote statistical significance at the 1%, 5%, and 10% level, respectively.

	(1)	(2)	(3)	(4)
Baseline	-0.126***	-0.130***	-0.081***	-0.085***
	(0.021)	(0.021)	(0.018)	(0.019)
High Rep (RL)	-0.123***	-0.128***	-0.080***	-0.084***
	(0.021)	(0.021)	(0.019)	(0.018)
High Rep (CP)	-0.132***	-0.137***	-0.083***	-0.086***
	(0.024)	(0.025)	(0.019)	(0.019)
(G)IIPS	-0.135***	-0.140***	-0.092***	-0.095***
	(0.022)	(0.023)	(0.020)	(0.021)
High Risk	-0.127***	-0.131***	-0.085***	-0.089***
	(0.023)	(0.023)	(0.019)	(0.019)
Macro variables	y_{EU},VSTOXX	y_{EU},VSTOXX	Time FE	Time FE
Bond risk	Duration	Duration(Aug)	Duration	Duration(Aug)

Table 10. CAC provisions and yield differentials: country risk, and quality of law/Robustness to monetary policy. This table presents random (bond-level) effects regression results to examine the effect of issuer risk and quality of law on the relation between CAC provisions and bond yields, accounting for heterogeneous (unconventional) monetary policy. 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). The dependent variable is weekly log-yield. The table reports the net effect of CAC provisions, evaluated at different credit ratings. In Panel A (resp., B) the first column is the baseline specification of column 4 in Table 4 (resp., column 4 in Table 5). The other columns augment the baseline with a country-level indicator variable and its interaction with time fixed effects. In Panel B countries are sorted into low and high quality of law based on the Rule of Law Indicator. Definitions of the explanatory variables are provided in Table A1. Standard errors are clustered at the country level. ***, **, and * denote statistical significance at the 1%, 5%, and 10% level, respectively.

Panel A

	(1)	(2)	(3)	(4)	(5)
Country sort		High Rep (RL)	High Rep (CP)	(G)IIPS	High Risk
AAA	-0.048	-0.042	-0.053	-0.070	-0.055
	(0.044)	(0.047)	(0.045)	(0.045)	(0.046)
AA+	-0.056	-0.051	-0.060	-0.075*	-0.062
	(0.038)	(0.040)	(0.039)	(0.039)	(0.039)
AA	-0.064**	-0.060*	-0.067**	-0.080**	-0.069**
	(0.032)	(0.034)	(0.033)	(0.033)	(0.033)
A	-0.087***	-0.086***	-0.088***	-0.096***	-0.091***
	(0.023)	(0.023)	(0.023)	(0.025)	(0.023)
A-	-0.095***	-0.095***	-0.095***	-0.102***	-0.098***
	(0.024)	(0.023)	(0.024)	(0.027)	(0.024)
BBB+	-0.102***	-0.104***	-0.102***	-0.107***	-0.105***
	(0.028)	(0.027)	(0.028)	(0.031)	(0.028)
BBB	-0.110***	-0.113***	-0.109***	-0.112***	-0.112***
	(0.033)	(0.032)	(0.033)	(0.036)	(0.032)
BBB-	-0.118***	-0.122***	-0.116***	-0.118***	-0.128**
	(0.038)	(0.038)	(0.039)	(0.042)	(0.056)
BB	-0.133***	-0.140***	-0.130**	-0.120***	-0.134***
	(0.051)	(0.051)	(0.052)	(0.038)	(0.051)
Week FE	YES	YES	YES	YES	YES
Week FE×Country sort	NO	YES	YES	YES	YES

Panel B

	(1)		(2)		(3)		(4)	
Country sort			High Rep (RL)		(G)IIPS		High Risk	
Quality of law	Low	High	Low	High	Low	High	Low	High
AAA		-0.046		-0.047		-0.054		-0.046
		(0.032)		(0.035)		(0.033)		(0.033)
AA+	-0.046	-0.101***	-0.049	-0.104***	-0.075	-0.108***	-0.056	-0.101***
	(0.067)	(0.034)	(0.068)	(0.036)	(0.065)	(0.033)	(0.062)	(0.035)
AA	-0.053		-0.055		-0.078		-0.062	
	(0.056)		(0.057)		(0.054)		(0.051)	
A	-0.073***	-0.319***	-0.075***	-0.332***	-0.086***	-0.327***	-0.078***	-0.322***
	(0.028)	(0.074)	(0.028)	(0.076)	(0.027)	(0.074)	(0.025)	(0.075)
A-	-0.080***	-0.373***	-0.082***	-0.389***	-0.089***	-0.382***	-0.084***	-0.377***
	(0.023)	(0.086)	(0.023)	(0.089)	(0.024)	(0.087)	(0.022)	(0.088)
BBB+	-0.087***	-0.427***	-0.088***	-0.446***	-0.092***	-0.436***	-0.089***	-0.432***
	(0.024)	(0.099)	(0.024)	(0.103)	(0.026)	(0.100)	(0.023)	(0.101)
BBB	-0.094***		-0.095***		-0.095***		-0.095***	
	(0.030)		(0.030)		(0.033)		(0.030)	
BBB-	-0.100***		-0.101***		-0.098**		-0.101***	
	(0.038)		(0.038)		(0.042)		(0.038)	
BB	-0.114*		-0.114*		-0.103		-0.112*	
	(0.058)		(0.059)		(0.063)		(0.058)	
Week FE	YES		YES		YES		YES	
Week FE×Country sort	NO		YES		YES		YES	

Table 11. CAC provisions and the overall cost of funding/Robustness to unconventional monetary policy. This table presents random (bond-level) effects regression results to examine the relation between the Euro CAC Initiative and bond yields, accounting for heterogeneous (unconventional) monetary policy. The sample ranges from January 1, 2011 to December 30, 2014 and includes 166 bonds issued before January 1, 2013 out of which 83 have maturities as close as possible to those of CAC bonds (matched bonds) and 83 are randomly chosen (random bonds). The dependent variable is weekly log-yield. *Matched* is an indicator equal to one for matched bonds, and *After* is an indicator equal to one for the period after January 1, 2013. $\hat{y}_{EU}$ (resp., $\widehat{VSTOXX}$) are predicted values from regressing y_{EU} (resp., $VSTOXX$) on the 10YR US benchmark (log-)yield (resp., the VIX index). The table reports the coefficient on the *After* indicator and the sum of *After*+*After*×*Matched*. "Baseline" refers to the specifications in Table 6. The other rows augment the baseline specification with a country-level indicator variable and its interaction with macro-variables. Definitions of the other explanatory variables are provided in Table A1. Standard errors are clustered at the country level. ***, **, and * denote statistical significance at the 1%, 5%, and 10% level, respectively.

		(1)	(2)	(3)	(4)
Baseline	After	-0.162	-0.140	-0.541***	-0.511***
		(0.106)	(0.108)	(0.092)	(0.088)
	After+Matched×After	0.087	0.102	-0.300***	-0.281***
		(0.104)	(0.106)	(0.084)	(0.080)
High Rep (RL)	After	-0.171*	-0.149	-0.531***	-0.503***
		(0.101)	(0.103)	(0.090)	(0.085)
	After+Matched×After	0.095	0.109	-0.271***	-0.254***
		(0.107)	(0.109)	(0.082)	(0.078)
High Rep (CP)	After	-0.170*	-0.147	-0.541***	-0.509***
		(0.103)	(0.105)	(0.095)	(0.089)
	After+Matched×After	0.085	-0.100	-0.290***	-0.269***
		(0.104)	(0.106)	(0.084)	(0.079)
(G)IIPS	After	-0.169	-0.146	-0.496***	-0.466***
		(0.106)	(0.108)	(0.094)	(0.089)
	After+Matched×After	0.084	0.100	-0.238***	-0.218***
		(0.105)	(0.107)	(0.081)	(0.076)
High Risk	After	-0.163	-0.140	-0.501***	-0.471***
		(0.106)	(0.108)	(0.093)	(0.087)
	After+Matched×After	0.090	0.105	-0.245***	-0.226***
		(0.105)	(0.107)	(0.082)	(0.077)
Macro variables		y_{EU},VSTOXX	y_{EU},VSTOXX	$\hat{y}_{EU}$,$\widehat{VSTOXX}$	$\hat{y}_{EU}$,$\widehat{VSTOXX}$
Bond risk		Duration	Duration(Aug)	Duration	Duration(Aug)

Table A1. Definition of variables. This table provides a detailed description of our variables. Data source is Bloomberg for all variables, except for High Rep which is sourced from the World Bank (resp. Transparency International). Ratings are measured every Friday; Rule of Law and Corruption Perceptions indicators are measured in 2012 and 2013. All other variables are weekly averages of daily values.

Variable	Description	Units/Scale
CAC	=1 if bond has CAC provisions, =0 otherwise	Binary
y_{EU}	Euro area government bond 10YR (AAA issuers)	% (log)
VSTOXX	Euro STOXX 50 Volatility Index	%
Duration	Duration	Years
Convexity	Convexity	
Duration(Aug)	Duration-0.5×(Convexity/100)	
Size	Amount outstanding	Mln € (log)
Bid-Ask Spread	Percentage bid-ask spread $(P_{ASK}-P_{BID})/P_{MID}$	%
Risk	S&P local currency LT debt issuer rating	1(AAA) to 12 (BB)
High Rep	=1 if Rule of Law (resp., Corruption Perceptions) indicator is above its cross-country median value, =0 otherwise	Binary
(G)IIPS	=1 for Ireland, Italy, Portugal and Spain, =0 otherwise	Binary
High Risk	=1 if issuer rating is above its cross-country median value, =0 otherwise	Binary