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

ELENA CARLETTI, PAOLO COLLA, MITU GULATI AND STEVEN ONGENA*

When do markets value contract protections? And does the quality of a legal system affects such valuations? To answer these questions we exploit a quasi-natural experiment whereby, after January 1, 2013, newly issued sovereign bonds of Eurozone countries under domestic law had to include Collective Action Clauses (CACs), which specify the minimum vote needed to modify payment terms. We find that CAC bonds trade at lower yields than otherwise similar no-CAC bonds and that the quality of the legal system matters for this differential. Hence markets see CACs as reducing the legal risk embedded in domestic law sovereign bonds. (*JEL classifications:* F33, G12, H63, K12)

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 assets of the borrower (e.g., Smith and Warner (1979)). The real issue is to what extent differences in the contract terms matter "at the front end", that is in normal times before things turn out bad (e.g., Bradley and Roberts (2015)). Ultimately, this is a question of whether and when law and lawyers matter.

One instance where the value of contract provisions has been extensively investigated is the inclusion in sovereign bonds of Collective Action Clauses (CACs) provisions, which specify the minimum vote required to modify the payment terms (e.g., Bradley and Gulati (2014)). 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

*Carletti: Department of Finance, Bocconi University, Via Roentgen 1, 20136 Milano, Italy (email: elena.carletti@unibocconi.it); Colla: Department of Finance, Bocconi University, Via Roentgen 1, 20136 Milano, Italy (email: paolo.colla@unibocconi.it); Gulati: School of Law, Duke University, 210 Science Drive, Box 90360, Durham, NC 27708, USA; Ongena: Department of Banking and Finance, University of Zurich, Plattenstrasse 14, CH-8032 Zürich, Switzerland. We thank for comments three anonymous referees, Lee Buchheit, Anna Gelpern, Peter Grasmann, Gerard Hertig, John Leahy (the editor), Martin Oehmke, Isabel Schnabel, Mark Weidemaier, officials at the debt offices for Germany, Spain, Portugal, France and the U.K., participants at the 1st Research Conference of the European Central Banking Network (Ljubljana), the 2016 Sovereign Debt Research Conference (Washington DC), the June 2016 Paris Club meetings, and seminar participants at Audencia Business School, the European Commission, ETH Zurich, the University of Lisbon-ISEG, and the University of Naples. Andrea Amato and Marco Forletta provided excellent research assistance. Elena Carletti and Paolo Colla acknowledge financial support from Baffi-Carefin Centre at Bocconi University.

restructurings and avoid prolonged and costly battles following a default (Panizza, Sturzenegger and Zettelmeyer (2009); Aguiar and Amador (2014)).

This debate revolved around CACs in foreign-law bonds, that is bonds issued under a different law (typically, English or New York) from that of the issuing country. In such an environment, CACs facilitate restructurings by specifying the minimum vote needed to modify payment terms, while bonds without CACs (henceforth, "no-CAC bonds") require unanimity of consensus for any modification. It follows that CACs entail a trade-off between reducing ex-post negotiation inefficiencies and increasing the ex-ante temptation of the sovereign to default. Based on this trade-off, empirical studies have measured the price impact of CACs on countries' cost of borrowing.[1]

The exclusive focus on foreign-law bonds provides an incomplete picture of the pricing effect of CACs for at least two reasons. First, a sovereign tends to issue foreign-law debt in a particular jurisdiction (e.g., either New York or London) and each juridisction has developed norms about which types of CACs to use or whether to use them at all.[2] This implies that countries tend to have either foreign-law CAC bonds or foreign-law no-CAC bonds, but rarely a combination of the two, so the identification of the pricing effect of the contract terms comes from cross-country variation.

Second, the inquiry into only foreign-law governed bonds leaves a large portion of the sovereign debt market unexamined as the vast majority of sovereign bonds are issued under local laws. This gap is important because it has left unanswered the question of whether contract provisions such as CACs can have value to investors in contexts where the court analysing a creditor's claim has dual and conflicting loyalites. With bonds governed by foreign law, the foreign court is going to enforce the contracts as they are written, and sympathies for the debtor are unlikely to play a role. That is, foreign-law bonds have a high degree of legal commitment (Chamon, Schumacher and Trebesch (2015)).[3] With a bond governed by local law, by contrast, the court owes conflicting loyalties, to both the sovereign

[1] See, for example, Dooley (2000), Shleifer (2003), Kletzer (2004), Haldane, Penalver, Saporta and Shin (2005), and Pitchford and Wright (2012), for theoretical contributions; and Becker, Richards and Thaicharoen (2003), Richards and Gugiatti (2003), Eichengreen and Mody (2004), Bardozzetti and Dottori (2014), and Bradley and Gulati (2014) for empirical analyses estimating the impact of CACs on countries' cost of borrowing.

[2] That is, if the norm in New York is to use a CAC with a 75% vote threshold, then all sovereigns issuing in New York tend to use that vote, whereas all of those issuing in the UK would use a different threshold if the norm were different in the UK.

[3] The idea of strong commitment is used in Aguiar and Amador (2014) to explain "original sin" in sovereign debt; that is the fact that many developing economies issue debt exclusively in foreign currency to international investors as a way to commit not to inflate.

(its boss) and the creditors (to protect the rule of law that it promised to uphold).[4] The question that we try to unpack is: *what is the value of a CAC in this latter, local law, setting?*

To answer the foregoing question, we utilize a unique experiment: the mandatory introduction of CACs in local-law bonds of Eurozone countries with maturities above one year as of January 1, 2013. As shown by the recent Greek "retrofit" of 2012, whereby CACs were legislatively imposed on the existing domestic-law bonds of Greece to conduct the restructuring, no-CAC bonds under domestic law are subject to what we call *legal risk* associated with the government's ability to change contract provisions retroactively after issuance.[5] In such a low commitment environment, contract provisions have value only if they are legally enforced (Eaton and Gersovitz (1981)). That is, if investors expect local legal institutions to stand up to attempts of the local government to expropriate from them.

To analyse whether this is the case for the Euro CAC initiative, we compare the secondary market yields of Eurozone bonds issued under local law 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). Given the large share 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 close residual maturities. Thus, we identify the price impact of CACs within countries rather than across countries, and we study the extent to which the introduction of CACs generates a "structural subordination" effect in the domestic-law Euro area sovereign debt market.

Structural subordination occurs when one set of loan contracts has stronger terms than another.[6] The holders of the bonds with stronger contract terms can demand better conditions in the event of a debt restructuring because they have a greater ability to sue and cause harm to the distressed issuer than the creditors with weaker terms (Choi and Gulati (2016)). Thus, our working assumption is that if CAC bonds bear a lower risk of being subject to a Greek-style retrofit, then they should receive different treatment from no-CAC bonds in after-default negotiation. In particular, in line with the idea in Bolton and Jeanne (2009) that in selective defaults debt that is harder to restructure, in legal terms, is de facto senior, we expect CAC bonds to have lower yields than no-CAC ones.

---

[4] In addition, sovereigns do not have the possibility to pass legislative enactments to reduce the value of the debt issue under foreign law. Moreover, as the recent *NML v. Argentina* litigation shows, the legal costs associated with the failure to comply with contract provisions can be substantial (Buchheit and Gulati (2017)).

[5] *Allen & Overy (2012) How the Greek Debt Reorganization of 2012 Changed the Rules of Sovereign Insolvency, Research Report Global Law Intelligence Unit (September-October).* Accordingly, domestic law bonds should trade at higher yields relative to foreign law bonds, as empirically documented in a recent set of papers (Choi, Gulati and Posner (2011); Clare and Schmidlin (2014); Chamon, Schumacher and Trebesch (2015); Nordvig (2015)).

[6] By contrast, legal subordination occurs when the debt contracts specify that one set of loans will be paid only *after* payments due on another set are satisfied (here, the former is legally subordinated to the latter).

Consistent with this expectation, we find a significant yield differential: our estimates indicate that yields on CAC bonds are, on average, 7.8 to 12.2 percent 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 gets larger as the borrower's credit quality deteriorates. Overall, these findings support the hypothesis that CACs add value to investors even in the low commitment environment of local-law bonds as a mechanism to reduce legal risk.

We then link the price impact of CACs to the quality of the legal system to examine whether the value of contract provisions varies with legal enforcement. To study this, we make use of the heterogeneity in the quality of legal systems across Eurozone countries as measured by means of country-level indicators. We expect the yield premium on CAC bonds relative to no-CAC bonds to be larger in countries with stronger legal systems because local governments are less likely to renege on the contract provisions if they face a significant risk that their local courts will rule such actions to be illegal. Exploiting the heterogeneity in the quality of law in our sample of Eurozone countries, we find that this is indeed the case.

To sum up, we document that CAC provisions are viewed favorably by market participants. We interpret this result as suggesting that CACs introduce a structural subordination in the Euro area sovereign debt market: as these provisions allow for a reduction of the legal risk embedded in domestic-law bonds, CAC bonds are likely to obtain better treatment upon default than no-CAC bonds. Anticipating this, investors trade them at a premium. This price impact is more pronounced in countries with a sizable probability of default and, importantly, with a good quality legal system. Our analysis makes use of a legal experiment that encompasses a series of desirable features that are rare to find: it concerns domestic-law bonds, 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 leading to different recoveries upon default.

Our paper relates to various strands of literature. First, the view that legal institutions affect contract interpretation and enforcement 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).

Second, 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 paper is most closely related to papers analysing 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 #3584) 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.

Finally, the result that CACs are effective in reducing the legal risk embedded in domestic-law sovereign bonds suggests that some form of legal enforcement mechanism is important. In this sense, the paper shares some insights with the literature analysing debt contracts with "partial commitment".[7] The key question here is whether more commitment improves efficiency. The answer depends on whether only borrowers or also lenders are plagued by weak enforcement problems, and on the feasible forms of borrowers' punishment in case of deviation. In this spirit, our result that a better quality of the legal system is associated with larger yield differential between CAC and no-CAC bonds is consistent with the insight in Debortoli and Nunes (2010) that more commitment leads to more efficient outcomes in the context of optimal fiscal policy.

The paper is organized as follows. Section II provides the background on the Euro CAC initiative and sets forth our predictions. Section III describes the dataset construction. Section IV presents the empirical findings on the price impact of CAC provisions. Section V concludes.

I. Background on the Euro CAC initiative and hypotheses

CACs are contract provisions that generally allow for a super majority 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 in crisis times 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)).

[7] See, e.g., Kovrijnykh (2013), and papers cited therein; and the survey in Aguiar and Amador (2014), for the implications of limited-commitment models in the context of sovereign debt.

While being present in almost all foreign-law sovereign bonds since early 2000s, CACs have been largely absent in domestic-law bonds till the 2013 Euro CAC initiative. In this section, we describe the background to the Euro CAC initiative and use it 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 in March 2012. As a result of the Greek crisis, 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)).

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).[8] 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)).[9]

The introduction of CACs into Eurozone sovereign debt was intended to ensure private sector involvement in future sovereign restructurings and reduce the legal uncertainty surrounding Greek-style restructurings (Gelpern and Gulati (2013)). Prior to January 2013, the overwhelming majority of bonds of Euro area countries were domestic-law governed and contained no such contract provisions.[10] If a sovereign wanted to restructure its bonds, it would have had to reach, in theory, the consensus of the unanimity of bondholders. Alternatively, given the bonds were under domestic law, the local legislature could use its power to legislate local laws specifying ex post the applicable modification procedures for the bonds. This is precisely what happened in Greece in March 2012, when CACs were

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

[9] 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 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).

[10] See the *2012 Credit Suisse Fixed Income Research Report* entitled "'Cac'ed!" (November 1).

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 the Greek CACs – the so-called Greek "retrofit" – was challenged in a variety of fora based on the basic claim that bondholders had their property rights unlawfully expropriated. As of this writing, the Greek restructuring has withstood all legal challenges. In upholding the legality of what Greece did, the key court decisions emphasized that Greece was in a deep financial crisis and that bondholders would have probably lost significantly more had the restructuring not occurred and had Greece been forced into a full blown default. In addition, the courts stressed the importance of investor expectations. The Greek bonds in 2012 had no mechanisms for restructuring in them. As a consequence, the legislature had to retrofit a mechanisn on to them and investors should not have been too surprised (Tsibanoulis and Anagnostopoulos (2014)); Grund (2017)).[11]

The above considerations beg the question of whether a legislative override would be permitted if the governments in question had pre-committed to a particular mechanism ahead of time (such as a CAC). If investors' expectations, based on what they were promised by policy makers, are key to a court's evaluation of the action, as the European Court of Human Rights (ECtHR) explained they were in its 2016 decision in *Mamatas and Others v. The Hellenic Republic*, the answer would seem to be "no". Below, after setting forth our hypotheses, we test whether this is indeed the case.

B. Hypotheses

The Greek retrofit and the subsequent Euro CAC initiative provide the basis for the predictions of our empirical analysis about the fate of CAC versus no-CAC bonds in a future Euro area sovereign restructuring.

The Greek retrofit shows that domestic-law bonds can be restructured by a domestic legislature changing the law. Thus, differently from foreign-law bonds, they entail a legal risk associated with the government's ability to pass legislation and change provisions retroactively after issuance. In other words, at least under certain conditions (deep financial crisis with unsustainable debt load and lack of

[11] See the case *Mamatas and Others v. The Hellenic Republic,* App no 63066/14 64297/14 66106/14 (ECHR, 21 July 2016). The relevant provision that was the basis of the legal challenge was Art. 1 Protocol no. 1 ECHR that stipulates the following: "Every natural or legal person is entitled to the peaceful enjoyment of his possessions. no one shall be deprived of his possessions except in the public interest and subject to the conditions provided for by law and by the general principles of international law. The preceding provisions shall not, however, in any way impair the right of a State to enforce such laws as it deems necessary to control the use of property in accordance with the general interest or to secure the payment of taxes or other contributions or penalties."

investors' expectations as set forth in the ECtHR's analysis of the Greek case) a government has the option of using the Greek retrofit strategy.

In this domestic-law governed bond environment, with a low committment to repay on the part of the government, the introduction of Euro CACs was seen as a tool to offer more legal protection to investors against the legislature someday trying to retroactively change contracts to make it easier for the sovereign to restructure (Bauer (2013); Kopf (2013)). As these clauses set the rules for debt restructuring, CACs generate expectations among investors about future recoveries from the bonds. Thus, although in theory it is still possible for a local government to change its law and disregard contract terms, reneging on the CAC provisions is likely to be more difficult, from a legal perspective, than defaulting on bonds without CACs as this would clearly violate investors' expectations and thus no longer satisfy one of the conditions underlying the determination of legality of the Greek retrofit.

It follows that the introduction of Euro CACs generates a structural subordination effect (Choi and Gulati (2016)), whereby each Euro area country has two different types of debt contracts outstanding – CAC and no-CAC bonds –, which are likely to be differentially vulnerable to restructuring attempts by the sovereign during times of crisis. In particular, given that CAC bonds offer better legal protection than no-CAC bonds, it is plausible to expect the following scenarios:

i) no-CAC bonds are restructured while CAC bonds are paid in full;
ii) both types of bonds are restructured, but CAC bondholders are offered better (or no worse) conditions than no-CAC bondholders to induce participation;
iii) both types of bonds are restructured via a Greek-style retrofit, so that CACs are violated.

In the first two scenarios, CAC bonds are treated (at least weakly) better than no-CAC bonds in that they accrue larger recoveries to bondholders. In the third scenario, they are treated the same as the no-CAC bonds (although they should have higher probability of success in the event of litigation). Thus, under these scenarios, we expect that investors value CAC bonds more as they anticipate these bonds to be less vulnerable to restructuring and thus lead to higher recoveries upon default. Our first prediction is then that in line with the idea in Bolton and Jeanne (2009), since CAC bonds are harder to restructure

from a legal perspective, they are de facto senior in selective defaults and thus should trade at a premium.[12]

A related question concerns the size of the yield differential between CAC and no-CAC bonds. An explicit goal of the Euro area policy makers was for the CACs to operate in an identical way across the member countries of the Eurozone. Article 12(3) of the European Stability Mechanism 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, they may not have the same effects in all seventeen different countries (Borroso (2013)). In particular, investors may expect a different degree of legal protection against expropriation by local governments across countries depending on the quality of the legal system and the credibility of domestic legal institutions (Kopf (2013)). In line with this, we expect the spread between CAC and no-CAC bonds will vary across Euro area countries and that this differential should correlate with the likelihood that the legal system will protect investors against expropriation by the state.

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"), bonds without CAC provisions issued before January 1, 2013 among which some 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

[12] This view is consistent with that expressed by the aforementioned *Credit Suisse (2012) Fixed Income Research Report* on the implications of Euro CACs, which ranks Euro area sovereign bonds (under local law) with CACs as less vulnerable to restructuring than those without CACs. The issue of CAC versus no-CAC bonds has also been the subject of investment reports more recently, in 2016, in the context of certain political parties in France and Italy threatening to redenominate their Euro denominated bonds into Franc or Lira denominated bonds. Here, along the lines of the CS report, multiple other investment funds have made an analogous prediction that Euro area CAC bonds under local law might fare better in the event of a currency redenomination than the no-CAC ones (e.g., *Mediobanca Securities Report*, January 19, 2017; *Morgan Stanley Report*, February 3, 2017, *ABN-AMRO Report*, February 17, 2017).

inflation linked. At this stage we select 106 bonds issued by 15 Eurozone countries.[13] 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,[14] 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 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.[15]

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,[16] 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

[13] 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.

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

[15] 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).

[16] 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 the documented in Table 1 for our CAC bonds.

line with that one obtains using central government long-term debt securities during the last quarter of 2014.

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. By the end of June 2013 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,[17] 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.[18] 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 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 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 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 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 50 bond pairs (representing about 60 percent of our sample) the difference in

[17] 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.

[18] 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*).

maturities is less than 6 months, and for 69 pairs (representing more than 80 percent of our sample) less than one year.

III. 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?

A. CAC Provisions and Yield Differentials

There are presently many different models of the term structure of interest rates, but little agreement on the one that should be used. We opt for a simple and flexible model, and pick a third-degree polynomial of the yield curve as our off-the-shelf term structure model. Our goal is to understand whether CAC and matched no-CAC bonds are accurately priced by this model. Yield curve fitting is sensitive to the maturities considered, and we could not find consensus on what maturities to include. We therefore consider two different models using different sets of maturities ("in-sample" maturities). Model 1 includes nine maturities (Jordan and Mansi (2000)), while Model 2 uses six maturities between 1 and 10 years (see Bank for International Settlements (2005)). Yields on in-sample maturities are sourced from Bloomberg,[19] and polynomials are estimated on weekly yields as simple averages of daily yields. For each model we fit, for every country and week, a third-degree polynomial of yields on maturities (in years). Making use of the estimated coefficients, we compute weekly absolute errors (AE) and absolute percentage errors (APE) for in-sample maturities as well as for CAC and matched no-CAC bonds. In unreported results we find that the in-sample fitting accuracy of the models increases along the term-structure. Our goal is to evaluate the weekly errors of CAC and matched no-CAC bonds against those of in-sample maturities. To this end, we create synthetic bonds from in-sample maturities as follows. To illustrate, the absolute error implied by Model 1 for the 10YR 3.9 percent Irish CAC bond issued on March 20, 2013 (ISIN: IE00B4S3JD47, maturity March 20, 2023) is 0.098 during its first week of trading, which we compare to a value of 0.091 –the AE that the model prescribes for the 10Y in-sample maturity during the same week. During the last week of 2014 the Irish bond has a residual maturity of 8.24 years, and we compare its AE (equal to 0.009) with the AE associated to the 8Y maturity during that week (equal to 0.023). Therefore, for every bond we have a

[19] Bloomberg yield curves include 13 maturities (3M, 6M, 1Y, 2Y, 3Y, 4Y, 5Y, 7Y, 10Y, 15Y, 20Y, 25Y, 30Y) and are available for all Eurozone countries except Slovenia. For Luxembourg they are available from June 12, 2014 onwards.

time-series of these differences in AE and APE, which we average across weeks to create bond-level mean difference in average errors (MAE-D) and percentage errors (MAPE-D). Table 3 provides summary statistics of MAE-D and MAPE-D in the cross-section of our sample bonds. The table reveals that these differences are statistically larger than zero, which is suggestive that CAC provisions constitute an omitted variable –at least from the lenses of our term structure model.

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,[20] 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 bond- as well as country-specific variables and also variables common to all countries (definitions of the explanatory variables are collected in Table A1 in Appendix). Consequently, the standard OLS identifying assumption applies which is that, after controlling for these controls (and others introduced hereafter), there is no omitted variable correlated with having a CAC provision that is influencing yields.

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).

[20] 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).

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.[21] Finally, since by construction matched no-CAC bonds are off-the-run while CAC bonds are on-the-run,[22] 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 percent), $BAS_{i,c,t}$. Note that bond size is usually time-varying, at the bond level, due to reopenings. Table 4 reports random-effects (RE) estimation results for several specifications. Standard errors are adjusted for clustering at the level of the matched bonds in the sample.[23]

The first two columns of Table 4 highlight that the pattern in the general level of sovereign yields as well as market-wide volatility positively affect bond yields. Table 4 further documents that including time fixed effects in lieu of macro variables 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 (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.[24]

Turning to our main variable of interest, CAC provisions negatively affect bond yields: our estimates indicate that yields on CAC bonds are, on average, 7.69 to 11.93 percent lower than those of matched no-CAC bonds – or equivalently they are lower by 13 to 20 bps (i.e., 7.69 percent $= 1 - \exp(-0.080)$ and 11.93 percent $= 1 - \exp(-0.127)$).

The regression specification (1) 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 variables that are common to all Eurozone countries, as well as to bond-specific characteristics. For instance, 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

[21] 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.

[22] 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.

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

[24] 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.

curve to ECB (conventional) monetary policy is quite homogeneous across countries.[25] Moreover, there is evidence that bond-level liquidity risk differs across the maturity spectrum (Beber, Brandt and Kavajecz (2009)).

To address these concerns, we replace specification (1) with a more flexible one that encompasses country-specific responses to all variables except the CAC indicator. Specifically, we add to specification (1) the interactions between country and time fixed effects, and those between country fixed effects and bond-level duration, size and bid-ask spread.[26] Thus, we maintain only one panel restriction –the CAC indicator– and include 1,378 regressors (39=13×3 interactions between the 13 country fixed effects and the 3 bond-level variables, and 1,339=13×103 interactions between country fixed effects and the 103 week fixed effects). This saturated model encompasses heterogeneous responses of bond yields both across countries and across time. Columns 5 and 6 in Table 4 report regression results using duration and augmented duration, respectively. Yields continue to be negatively associated with the CAC indicator, although the economic and statistical magnitude of this effect are lower than those documented for the specifications in the first four columns: point estimates in columns 5 and 6 would translate into a 9 bps yield wedge between CAC and matched no-CAC bond yields.

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 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 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 95 percent confidence intervals (shaded grey area). As the figure reveals, we cannot exclude that yields differ between CAC and no-CAC bonds only for a handful of cross-sections (7 weeks). Overall,

[25] 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.

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

the yield differential between CAC and matched no-CAC bonds is persistently negative and statistically significant 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:

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

Regression results for specification (2) are reported in Table 5. The dependence of yields on control variables is in line with Table 4. 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 5 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.

We also explore non-linearities in the relation between country risk and the yield differential associated to CAC provisions by interacting the CAC indicator with broad ratings –defined as ratings levels including the minus, middle and plus specifications for a particular rating. With the sole exception of the broad rating AA (where the net effect is not significant), we continue to document a negative yield differential which gets larger in the low-credit quality spectrum (broad ratings BBB and BB).

Overall, these findings support the hypothesis that CAC provisions help reducing the legal risk embedded in sovereign bonds under domestic law, and particularly so when issuers' probability of default is sizable.

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 analyse 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 (2011) 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 (Rohwer (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.[27] 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

[27] 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 (Rohwer (2009)).

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 6. Consistent with the evidence of Tables 4 and 5, 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. Moreover, the quality of law does not impact bond yields directly. 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.[28] As the figure reveals, the yield reduction for CAC bonds is more pronounced for 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*).[29] 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) (Rohwer (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 6 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 relevance of legal risk premia in domestic law bonds. CAC bonds trade at

[28] 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.

[29] 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.

lower yields especially in countries with strong legal systems where investors can be reassured that the new provisions will effectively be implemented.

IV. Conclusion

In this paper we have exploited the Euro Collective Action Clause (CAC) initiative of 2013 to obtain results on a basic question in law and finance: are bond contract terms priced? We ask that question in an arena where it has not been systematically investigated prior to this: the context of local or domestic-law governed sovereign bonds. Given that governments can always change their local laws, one might predict that contract provisions in local-law sovereign bonds would have no value. Our findings suggest otherwise, and particularly so in the bonds of countries with stronger legal systems.

REFERENCES

Acemoglu, Daron and Simon Johnson. 2005. "Unbundling Institutions." *Journal of Political Economy*, 113(5), 949-95.

Aguiar, Mark and Manuel Amador. 2014. "Sovereign Debt," G. Gopinath, E. Helpman and K. Rogoff, *Handbook of International Economics.* Amsterdam: North-Holland, 647-87.

Altavilla, Carlo; Domenico Giannone and Michele Lenza. 2016. "The Financial and Macroeconomic Effects of the Omt Announcements." *International Journal of Central Banking*, 12(3), 29-57.

Anderlini, Luca; Leonardo Felli and Alessandro Riboni. 2014. "Why Stare Decisis?" *Review of Economic Dynamics*, 17(4), 726-38.

Bank for International Settlements. 2005. "Zero-Coupon Yield Curves: Technical Documentation." Basel: Monetary and Economic Department, BIS Paper.

Bardozzetti, Alfredo and Davide Dottori. 2014. "Collective Action Clauses: How Do They Affect Sovereign Bond Yields?" *Journal of International Economics*, 92(2), 286-303.

Bauer, Klaus-Albert. 2013. "The Euro Area's Collective Action Clauses: Some Questions and Answers," P. S. Kenadjian, K.-A. Bauer and A. Cahn, *Collective Action Clauses and the Restructuring of Sovereign Debt.* Frankfurt: Institute for Law and Finance, 3-14.

Beber, Alessandro; Michael W. Brandt and Kenneth A. Kavajecz. 2009. "Flight-to-Quality or Flight-to-Liquidity? Evidence from the Euro-Area Bond Market." *Review of Financial Studies*, 22(3), 925-57.

Becker, Torbjörn; Anthony Richards and Yunyong Thaicharoen. 2003. "Bond Restructuring and Moral Hazard: Are Collective Action Clauses Costly?" *Journal of International Economics*, 61(1), 127-61.

Bolton, Patrick and Olivier Jeanne. 2009. "Structuring and Restructuring Sovereign Debt: The Role of Seniority." *Review of Economic Studies*, 76(3), 879-902.

Borroso, Antonio Sainz de Vicuna. 2013. "Identical Collective Action Clauses for Different Legal Systems," P. S. Kenadjian, K.-A. Bauer and A. Cahn, *Collective Action Clauses and the Restructuring of Sovereign Debt.* Frankfurt: Institute for Law and Finance, 15-24.

Bradley, Michael and Mitu Gulati. 2014. "Collective Action Clauses for the Eurozone." *Review of Finance*, 18(6), 2045-102.

Bradley, Michael and Michael R. Roberts. 2015. "The Structure and Pricing of Corporate Debt Covenants." *Quarterly Journal of Finance*, 52(2), 1-37.

Breen, Michael and Iain McMenamin. 2013. "Political Institutions, Credible Commitment, and Sovereign Debt in Advanced Economies." *International Studies Quarterly*, 57(4), 842-54.

Buchheit, Lee C. and G. Mitu Gulati. 2017. "Restructuring Sovereign Debt after Nml V. Argentina." *Capital Markets Law Journal*, Forthcoming.

Burn, Lachlan. 2013. "Bondholder Resolutions in the Courtroom," P. S. Kenadjian, K.-A. Bauer and A. Cahn, *Collective Action Clauses and the Restructuring of Sovereign Debt.* Frankfurt: Institute for Law and Finance, 73-84.

Cameron, A. Colin; Jonah B. Gelbach and Douglas L. Miller. 2011. "Robust Inference with Multi-Way Clustering." *Journal of Business and Economic Statistics*, 29(2), 238-49.

Chamon, Marcos; Julian Schumacher and Christoph Trebesch. 2015. "Foreign Law Bonds: Can They Reduce Sovereign Borrowing Costs?" Verein für Socialpolitik / German Economic Association, Mimeo.

Choi, Stephen J. and G. Mitu Gulati. 2016. "The Pricing of Non-Price Terms in Sovereign Bonds: The Case of the Greek Guarantees." *Journal of Law, Finance, and Accounting*, 1, 1-40.

Choi, Stephen J.; Mitu Gulati and Eric A. Posner. 2011. "Pricing Terms in Sovereign Debt Contracts: A Greek Case Study with Implications for the European Crisis Resolution Mechanism." *Capital Markets Law Journal*, 6(2), 163-87.

Clare, Andrew and Nicolas Schmidlin. 2014. "The Impact of Foreign Governing Law of European Government Bond Yields." London: City University London, Mimeo.

Davis, Kevin E. 2014. "Legal Indicators: The Power of Quantitative Measures of Law." *Annual Review of Law and Social Science*, 10(1), 37-52.

Debortoli, Davide and Ricardo Nunes. 2010. "Fiscal Policy under Loose Commitment." *Journal of Economic Theory*, 145(3), 1005-32.

Djankov, Simeon; Rafael La Porta; Florencio Lopez-de-Silanes and Andrei Shleifer. 2003. "Courts." *Quarterly Journal of Economics*, 118(2), 453-518.

Dooley, Michael P. 2000. "International Financial Architecture and Strategic Default: Can Financial Crises Be Less Painful?" *Carnegie-Rochester Conference Series on Public Policy*, 53(1), 361-77.

Eaton, Jonathan and Mark Gersovitz. 1981. "Debt with Potential Repudiation: Theoretical and Empirical Analysis." *Review of Economic Studies*, 48(2), 289-309.

Eichengreen, Barry and Ashoka Mody. 2004. "Do Collective Action Clauses Raise Borrowing Costs?" *Economic Journal*, 114(495), 247-64.

Eser, Fabian and Bernd Schwaab. 2016. "Evaluating the Impact of Unconventional Monetary Policy Measures: Empirical Evidence from the Ecb's Securities Markets Programme." *Journal of Financial Economics*, 119(1), 147-67.

Favero, Carlo; Marco Pagano and Ernst-Ludwig von Thadden. 2010. "How Does Liquidity Affect Government Bond Yields?" *Journal of Financial and Quantitative Analysis*, 45(1), 107-34.

Gelpern, Anna and Mitu Gulati. 2013. "The Wonder-Clause." *Journal of Comparative Economics*, 41(2), 367-85.

Gennaioli, Nicola and Giacomo A. M. Ponzetto. 2015. "Contract Innovation and Legal Evolution and under Imperfect Enforcement." London: Centre for Economic Policy Research, Discussion Paper.

Ghysels, Eric; Julien Idier; Simone Manganelli and Olivier Vergote. 2016. "A High-Frequency Assessment of the Ecb Securities Markets Programme." *Journal of the European Economic Association*, Forthcoming.

Ginsburg, Tom. 2011. "Pitfalls of Measuring the Rule of Law." *Hague Journal on the Rule of Law*, 3(2), 269-80.

Grund, Jonathan. 2017. "Restructuring Government Debt under Local Law: The Greek Experience and Implications for Investor Protection." *Capital Markets Law Journal*, Forthcoming.
Gündüz, Yalin and Orcun Kaya. 2014. "Impacts of the Financial Crisis on Eurozone Sovereign CDS Spreads." *Journal of International Money and Finance*, 49, Part B, 425-42.
Haldane, Andrew G.; Adrian Penalver; Victoria Saporta and Hyun Song Shin. 2005. "Analytics of Sovereign Debt Restructuring." *Journal of International Economics*, 65(2), 315-33.
Hofmann, Christian. 2014. "Sovereign Debt Restructuring in Europe under the New Collective Action Clauses." *Texas Journal of International Law*, 49, 382-441.
Jordan, James V. and Sattar Mansi. 2000. "How Well Do Constant Maturity Treasuries Approximate the on-the-Run Term Structure?" *Journal of Fixed Income*, 10, 1-11.
Kaufmann, Daniel; Aart Kraay and Massimo Mastruzzi. 2011. "The Worldwide Governance Indicators: Methodology and Analytical Issues." *Hague Journal on the Rule of Law*, 3(2), 220-46.
Kletzer, Kenneth M. 2004. "Sovereign Bond Restructuring: Collective Action Clauses and Official Crisis Intervention," A. G. Haldane, *Fixing Financial Crises in the 21st Century.* London: Routledge, 230-53.
Kopf, Christian. 2013. "Sovereign Debt Restructuring: Lessons from History," P. S. Kenadjian, K.-A. Bauer and A. Cahn, *Collective Action Clauses and the Restructuring of Sovereign Debt.* Frankfurt: Institute for Law and Finance, 149-80.
Kovrijnykh, Natalia. 2013. "Debt Contracts with Partial Commitment." *American Economic Review*, 103(7), 2848-74.
Lerner, Joshua and Antoinette Schoar. 2005. "Does Legal Enforcement Affect Financial Transactions? The Contractual Channel in Private Equity." *Quarterly Journal of Economics*, 120(1), 223-46.
Nordvig, Jens. 2015. "Legal Risk Premia During the Euro Crisis: The Role of Credit and Redenomination Risk." Odensee: University of Southern Denmark, Mimeo.
North, Douglass C. and Barry R. Weingast. 1989. "Constitutions and Commitment: The Evolution of Institutions Governing Public Choice in Seventeenth-Century England." *Journal of Economic History*, 49(4), 803-32.
Nunn, Nathan. 2007. "Relationship-Specificity, Incomplete Contracts, and the Pattern of Trade." *Quarterly Journal of Economics*, 122(2), 569-600.
Panizza, Ugo; Federico Sturzenegger and Jeromin Zettelmeyer. 2009. "The Economics and Law of Sovereign Debt and Default." *Journal of Economic Literature*, 47(3), 651-98.
Pasquariello, Paolo and Clara Vega. 2009. "The on-the-Run Liquidity Phenomenon." *Journal of Financial Economics*, 92(1), 1-24.
Persson, Torsten; Gerard Roland and Guido Tabellini. 1997. "Separation of Powers and Political Accountability." *Quarterly Journal of Economics*, 112, 1163-202.
Pitchford, Rohan and Mark L. J. Wright. 2012. "Holdouts in Sovereign Debt Restructuring: A Theory of Negotiation in a Weak Contractual Environment." *Review of Economic Studies*, 79(2), 812-37.
Qian, Jun and Philip. E. Strahan. 2007. "How Law and Institutions Shape Financial Contracts: The Case of Bank Loans." *Journal of Finance*, 62, 2803-34.
Richards, Anthony and Mark Gugiatti. 2003. "Do Collective Action Clauses Influence Bond Yields? New Evidence from Emerging Markets." *International Finance*, 6(3), 415-47.
Rohwer, Anja. 2009. "Measuring Corruption: A Comparison between the Transparency International's Corruption Perceptions Index and the World Bank's Worldwide Governance Indicators." *CESifo DICE Report*, 7(3), 42-52.

Shleifer, Andrei. 2003. "Will the Sovereign Debt Market Survive?" *American Economic Review*, 93(2), 85-90.

Smith, Clifford Jr. and Jerold B. Warner. 1979. "Bankruptcy, Secured Debt. And Optimal Capital Structure: Comment." *Journal of Finance*, 34, 247-51.

Stasavage, David. 2002. "Credible Commitment in Early Modern Europe: North and Weingast Revisited." *Journal of Law, Economics, and Organization*, 18(1), 155-86.

Tsibanoulis, Dimitris and Iakovos Anagnostopoulos. 2014. "The Greek Psi and the Litigation Surrounding It." *International Review of Financial Services*, (2), 18-24.

Warga, Arthur. 1992. "Bond Returns, Liquidity, and Missing Data." *The Journal of Financial and Quantitative Analysis*, 27(4), 605-17.

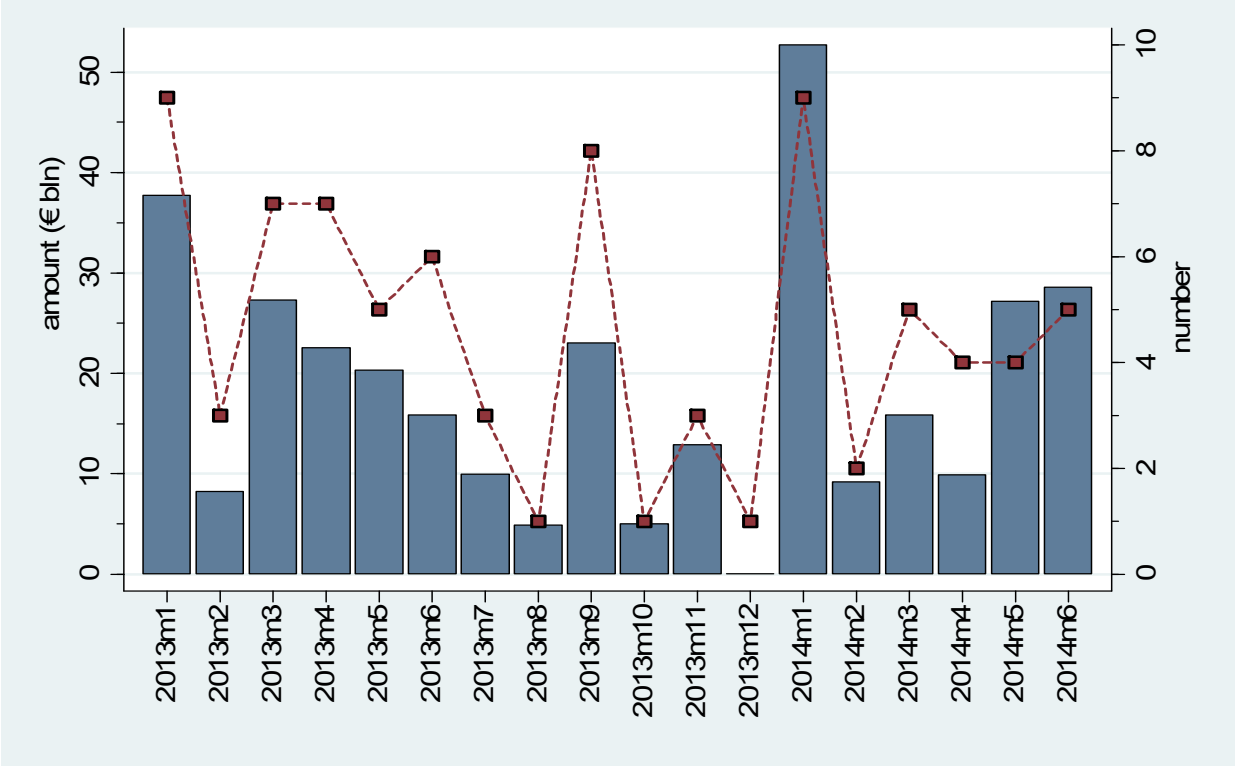


FIGURE 1. CAC BONDS ISSUANCES

Notes: 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.

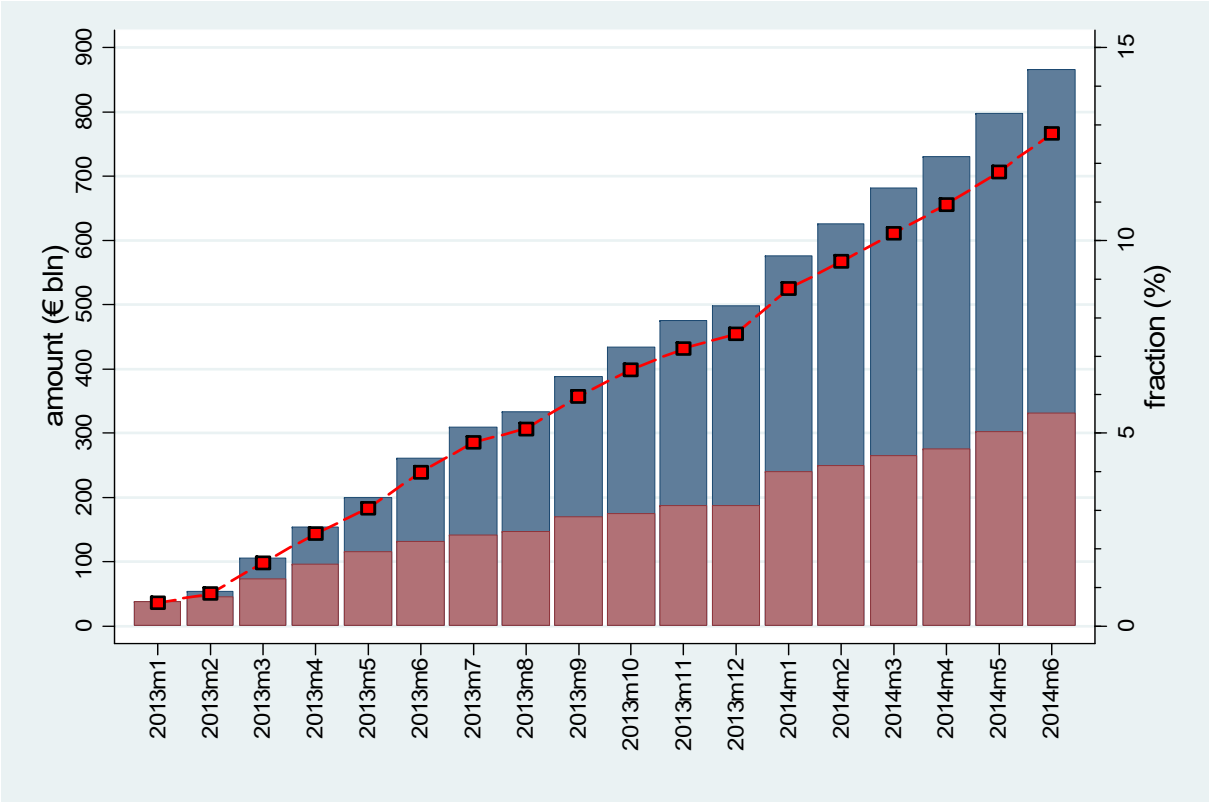


FIGURE 2. CAC BONDS OUTSTANDING

Notes: 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.

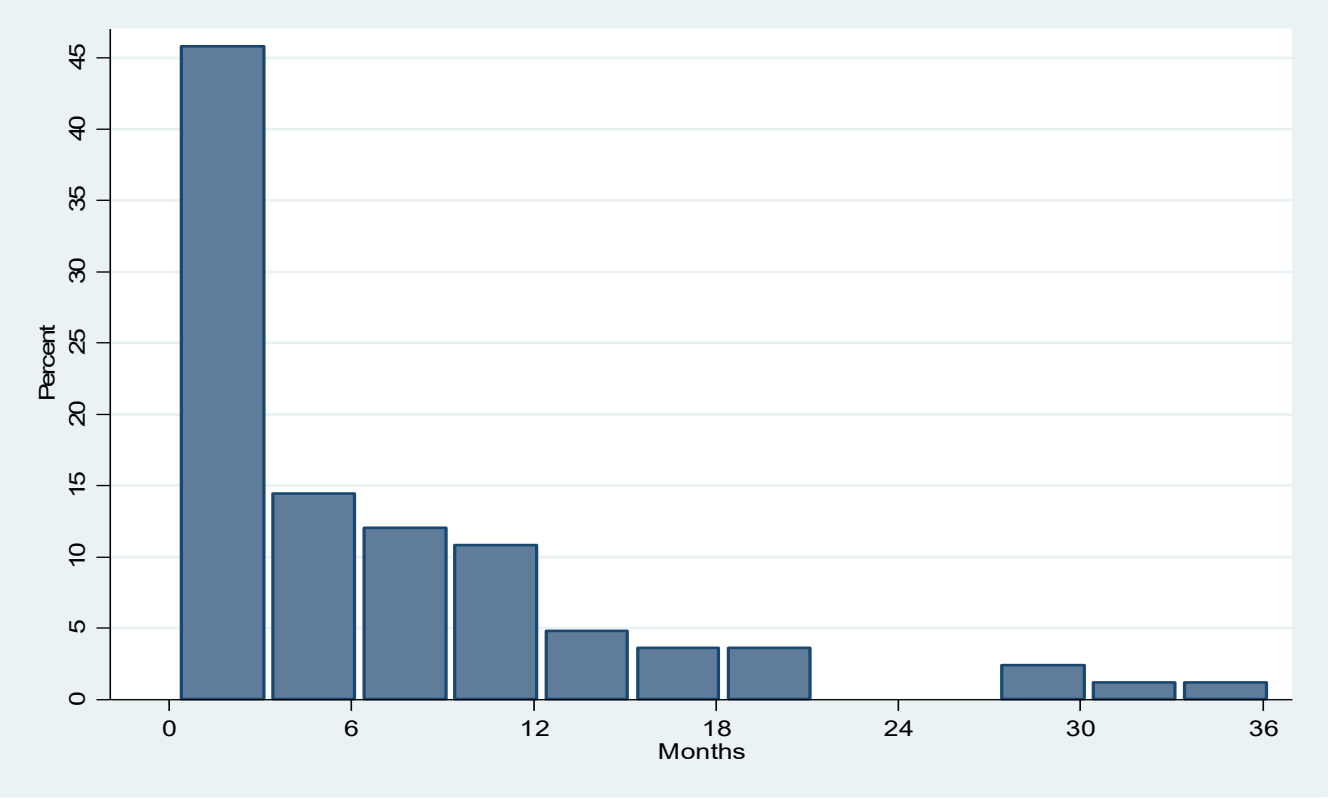


FIGURE 3. MATURITY DIFFERENTIAL BETWEEN CAC AND MATCHED NO-CAC BONDS

Notes: 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.

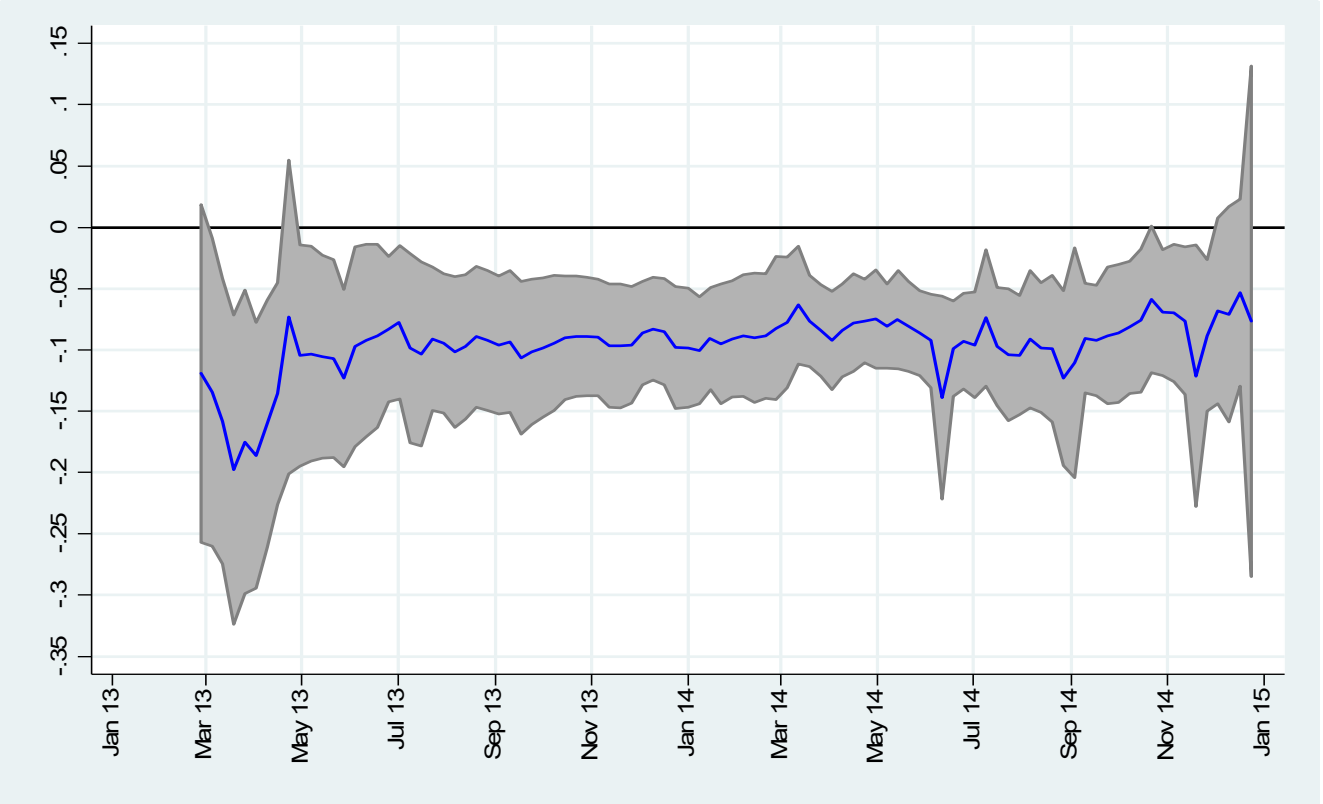
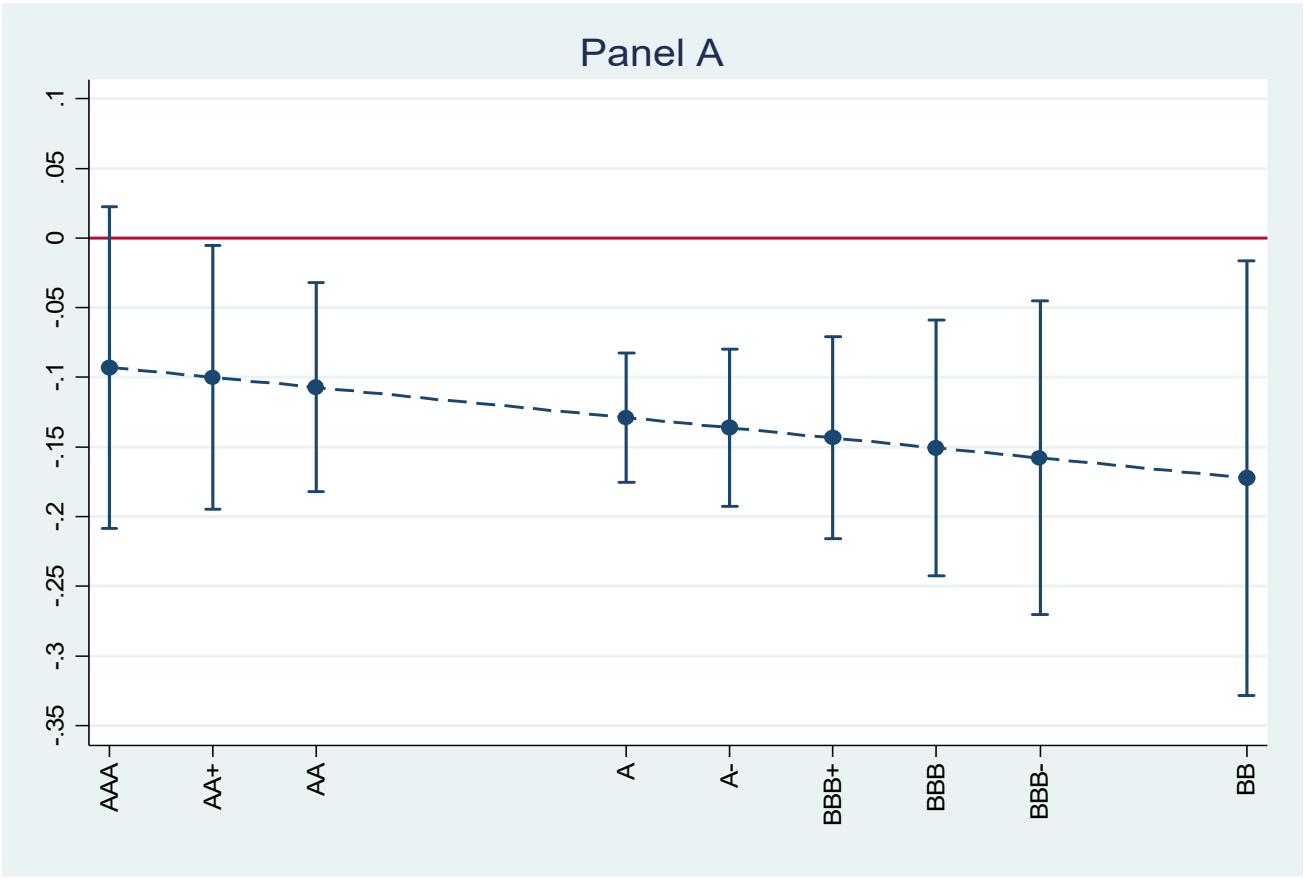


FIGURE 4. CAC PROVISIONS AND YIELD DIFFERENTIALS, OVER TIME

Notes: Point estimates (solid blue line) together with their 95 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. 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.



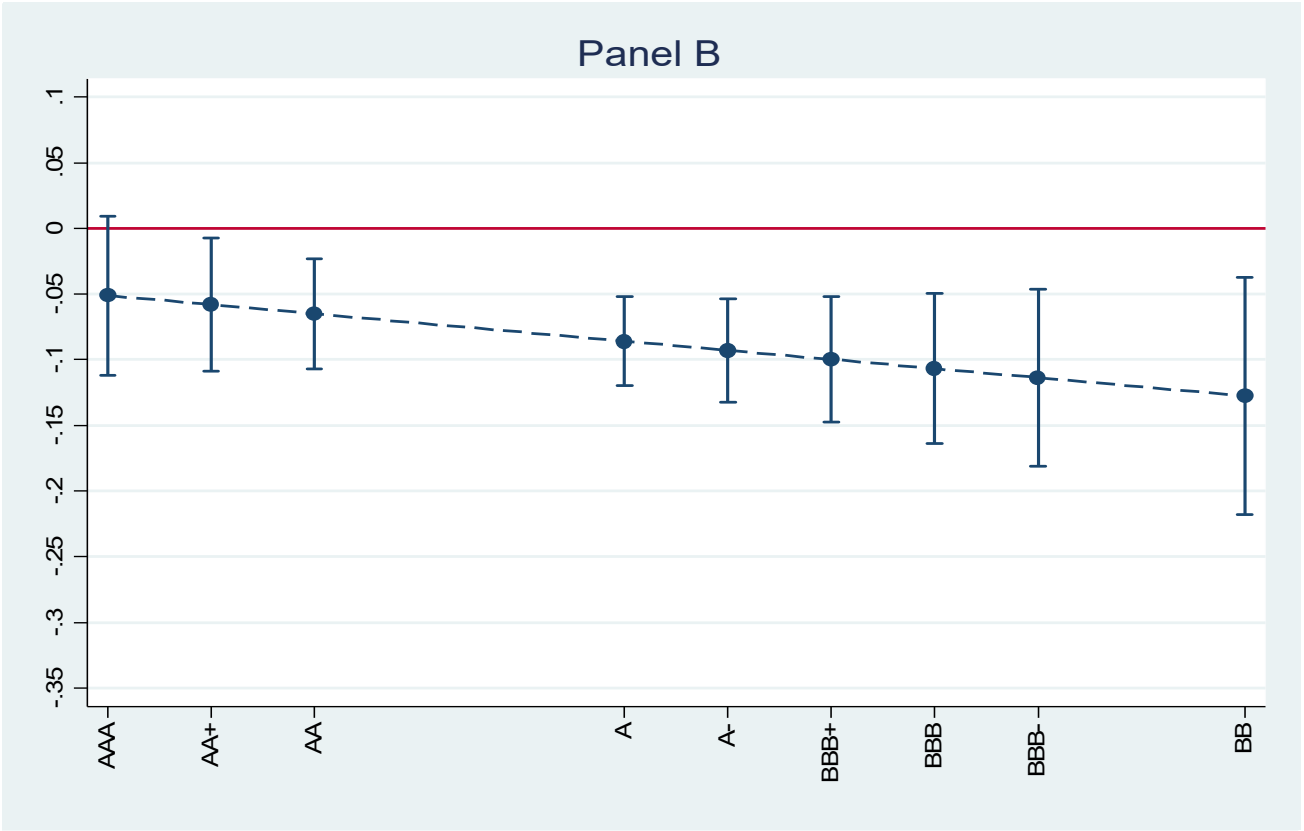


FIGURE 5. COUNTRY RISK AND THE NET EFFECT OF CAC PROVISIONS

Notes: This figure plots the estimated net effect of CAC provisions on bond yields along the rating spectrum, together with its 95 percent confidence interval. Panel A (resp., B) plots the effect for column 2 (resp., 4) in Table 6.

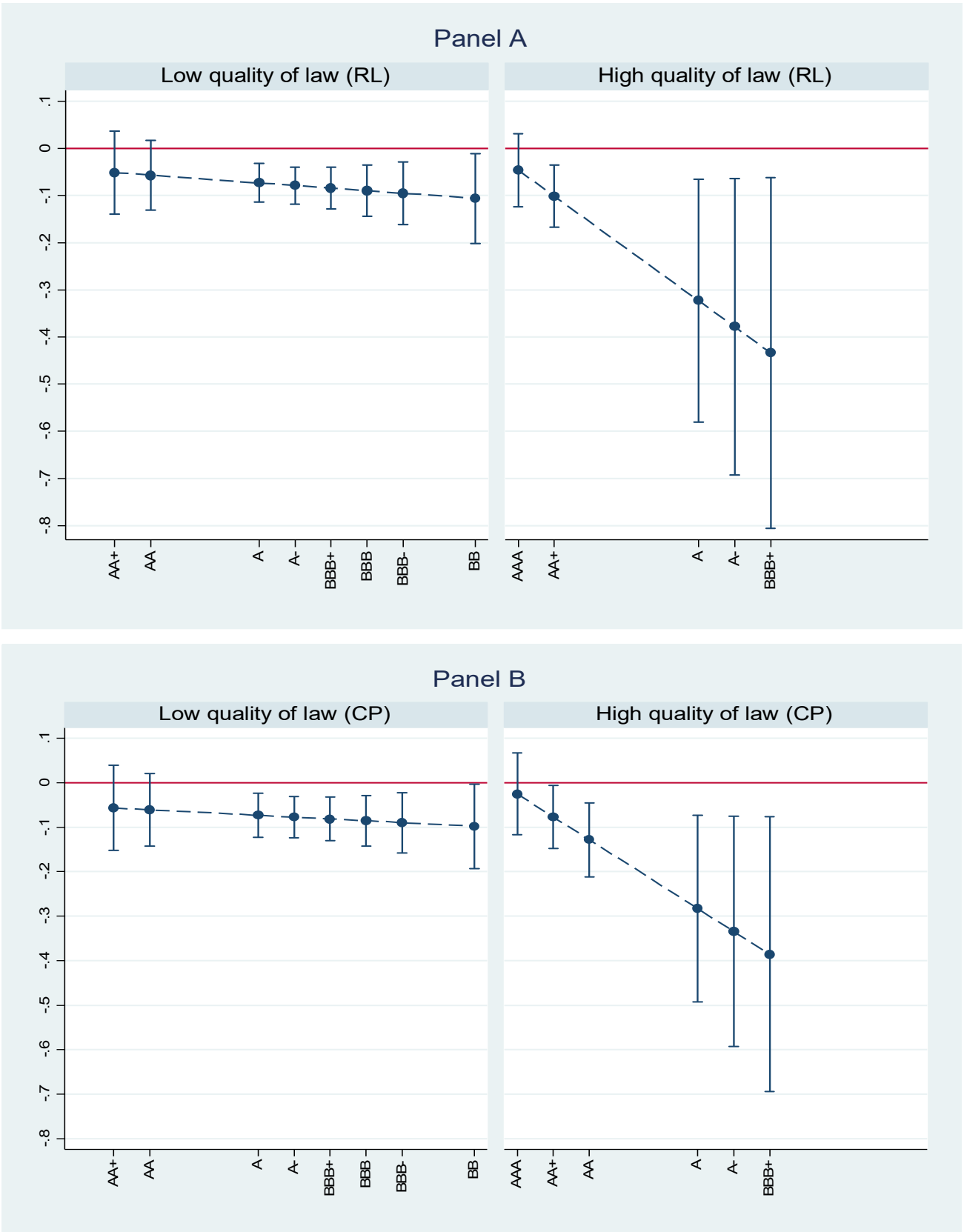


FIGURE 6. COUNTRY RISK, QUALITY OF LAW, AND THE NET EFFECT OF CAC PROVISIONS

Notes: 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 percent 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 7.

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

Notes: 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)				Diff.
	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	0.02
Duration (yrs)	6.136	6.51	0.976	12.038	5.808	5.878	0.997	11.156	-0.327***
Amount (€mln)	9801.3	9126.3	5.7	21185.8	13092.1	13598.3	22.3	28068.4	3290.8***
BA Spread (%)	0.138	0.045	0.013	0.649	0.16	0.049	0.014	0.837	0.022***
Maturity (yrs)	7.644	7.545	1.496	15.789	7.66	7.323	2.003	15.493	0.017

Notes: 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. 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 ranges between January 1, 2013 and December 30, 2014. 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--PRICING ERRORS OF CAC AND MATCHED NO-CAC BONDS

Panel A. Term structure model with nine benchmark maturities

	Mean	Median	5th Pct.	95th Pct.	Fraction >0
MAE-D	0.149***	0.022	-0.025	1.121	78.75***
MAPE-D	9.240***	2.876	-2.219	48.195	80***

Panel B. Term structure model with seven benchmark maturities

	Mean	Median	5th Pct.	95th Pct.	Fraction >0
MAE-D	0.296***	0.035	0.008	1.383	96.875***
MAPE-D	12.250***	3.829	0.751	75.833	96.875***

Notes: This table presents means, medians, 5th and 95th percentiles, and fractions of positive values of pricing errors 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. For each bond-week we compute its absolute error (AE) and absolute percentage error (APE) as the difference between its weekly yield and the weekly yield predicted by a third-order polynomial of the yield curve. The polynomial is estimated for each country-week, using nine benchmark maturities (3M,6M,1Y,2Y,3Y,5Y,7Y,10Y,30Y) in Panel A and seven benchmark maturities (1Y,2Y,3Y,4Y,5Y,7Y,10Y,30Y) in Panel B. For each bond-week, AE-D (resp. APE-D) is the difference between its AE (resp. APE) and the absolute error (resp. absolute percentage error) implied by the term structure model for the benchmark maturity closer to the bond residual maturity. For each bond, MAE-D (resp. MAPE-D) is the average of its AE-D (resp. APE-D). We test whether the cross-sectional average values of MAE-D and MAPE-D are equal to zero, and whether the fractions of positive signs of MAE-D and MAPE-D are equal to 1/2.

*** Significant at the 1 percent level.

** Significant at the 5 percent level.

* Significant at the 10 percent level.

TABLE 4--CAC PROVISIONS AND YIELD DIFFERENTIALS

(dependent variable: weekly log-yield)

	(1)	(2)	(3)	(4)	(5)	(6)
CAC	-0.122***	-0.127***	-0.080***	-0.084***	-0.052*	-0.056**
	(0.023)	(0.023)	(0.017)	(0.016)	(0.029)	(0.028)
y_{EU}	1.366***	1.350***				
	(0.084)	(0.083)				
VSTOXX	0.024***	0.024***				
	(0.004)	(0.004)				
Duration	0.358***		0.234***			
	(0.036)		(0.021)			
Duration(Aug)		0.399***		0.260***		
		(0.037)		-0.021		
Size	-0.037	-0.036	-0.025	-0.026		
	(0.023)	(0.022)	(0.017)	(0.016)		
Bid-Ask Spread	0.099	0.094	0.003	-0.003		
	(0.125)	(0.123)	(0.112)	(0.110)		
Risk	0.101***	0.108***	0.124***	0.129***		
	(0.034)	(0.033)	(0.014)	(0.014)		
Week Fixed Effects	No	No	Yes	Yes	-	-
Country Fixed Effects	No	No	No	No	-	-
Country × Week Fixed Effects	No	No	No	No	Yes	Yes
Country Fixed Effects × (Bond characteristics)	No	No	No	No	Yes	Yes
Number of Observations	10,952	10,952	10,952	10,952	10,952	10,952
Number of Bonds	166	166	166	166	166	166
Adjusted R-squared	0.615	0.626	0.743	0.755	0.874	0.880

Notes: This table presents bond-level random 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). Bond characteristics in column 5 (resp. 6) include Duration (resp. Duration(Aug.)), Size and Bid-Ask Spread. Definitions of the explanatory variables are provided in Table A1. Fixed effects are either included ("Yes"), not included ("No") or spanned by another set 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 5--PLACEBO TEST

(dependent variable: weekly log-yield)

	(1)	(2)	(3)	(4)	(5)	(6)
Pseudo CAC	-0.079*	-0.082*	-0.037	-0.038	-0.018	-0.021
	(0.047)	(0.047)	(0.030)	(0.029)	(0.028)	(0.027)
y_{EU}	1.569***	1.555***				
	(0.227)	(0.223)				
VSTOXX	0.021***	0.021***				
	(0.003)	(0.003)				
Duration	0.186***		0.147***			
	(0.042)		(0.024)			
Duration(Aug)		0.211***		0.163***		
		(0.046)		(0.026)		
Size	-0.075*	-0.073*	-0.043*	-0.042*		
	(0.040)	(0.039)	(0.022)	(0.021)		
Bid-Ask Spread	0.250***	0.249***	0.197**	-0.195**		
	(0.090)	(0.089)	(0.078)	(0.078)		
Risk	0.155***	0.157***	0.199***	0.202***		
	(0.034)	(0.033)	(0.029)	(0.029)		
Week Fixed Effects	No	No	Yes	Yes	-	-
Country Fixed Effects	No	No	No	No	-	-
Country × Week Fixed Effects	No	No	No	No	Yes	Yes
Country Fixed Effects × (Bond characteristics)	No	No	No	No	Yes	Yes
Number of Observations	9,440	9,440	9,440	9,440	9,440	9,440
Number of Bonds	146	146	146	146	146	146
Adjusted R-squared	0.610	0.603	0.719	0.723	0.825	0.830

Notes: This table presents bond-level random effects regression results to examine the relation between 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, 2013 (matched pseudo no-CAC bonds). Bond characteristics in column 5 (resp. 6) include Duration (resp. Duration(Aug.)), Size and Bid-Ask Spread. Definitions of the explanatory variables are provided in Table A1. Fixed effects are either included ("Yes"), not included ("No") or spanned by another set 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--CAC PROVISIONS AND YIELD DIFFERENTIALS: COUNTRY RISK

(dependent variable: weekly log-yield)

	(1)	(2)	(3)	(4)
CAC	-0.075	-0.086	-0.034	-0.044
	(0.072)	(0.070)	(0.038)	(0.036)
y_{EU}	1.366***	1.350***		
	(0.084)	(0.083)		
VSTOXX	0.024***	0.024***		
	(0.004)	(0.004)		
Duration	0.359***		0.234***	
	(0.037)		(0.021)	
Duration(Aug)		0.400***		0.260***
		(0.038)		(0.021)
Size	-0.036	-0.035	-0.024	-0.026
	(0.023)	(0.022)	(0.017)	(0.016)
Bid-Ask Spread	0.099	0.094	0.003	-0.002
	(0.125)	(0.123)	(0.112)	(0.110)
Risk	0.105***	0.111***	0.128***	0.132***
	(0.033)	(0.033)	(0.014)	(0.013)
Risk×CAC	-0.008	-0.007	-0.008	-0.007
	(0.012)	(0.012)	(0.006)	(0.006)
Week Fixed Effects	No	No	Yes	Yes
Number of Observations	10,952	10,952	10,952	10,952
Number of Bonds	166	166	166	166
Adjusted R-squared	0.614	0.625	0.743	0.755
Net effect of CAC at rating =				
AAA	-0.084	-0.093	-0.042	-0.051*
	(0.060)	(0.059)	(0.032)	(0.031)
A	-0.125***	-0.129***	-0.083***	-0.086***
	(0.024)	(0.024)	(0.017)	(0.017)
BB	-0.175**	-0.172**	-0.131***	-0.128***
	(0.081)	(0.080)	(0.047)	(0.046)

Notes: This table presents bond-level random 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). Definitions of the explanatory variables are provided in Table A1. Fixed effects are either included ("Yes") or not included ("No"). The bottom part of the table shows the net effect of CAC provisions for selected country ratings. 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 7--CAC PROVISIONS AND YIELD DIFFERENTIALS: COUNTRY RISK AND QUALITY OF LAW

(dependent variable: weekly log-yield)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
CAC	-0.099	-0.105	-0.032	-0.04	-0.108	-0.118	-0.041	-0.048
	(0.089)	(0.088)	(0.062)	(0.061)	(0.101)	(0.099)	(0.065)	(0.064)
y_{EU}	1.354***	1.337***			1.352***	1.335***		
	(0.083)	(0.081)			(0.082)	(0.081)		
VSTOXX	0.024***	0.023***			0.024***	0.023***		
	(0.004)	(0.004)			(0.004)	(0.004)		
Duration	0.369***		0.239***		0.364***		0.236***	
	(0.037)		(0.021)		(0.037)		(0.020)	
Duration(Aug)		0.411***		0.265***		0.406***		0.262***
		(0.038)		(0.021)		(0.038)		(0.021)
Size	-0.026	-0.025	-0.021	-0.023	-0.049**	-0.049**	-0.032	-0.034*
	(0.025)	(0.025)	(0.019)	(0.018)	(0.025)	(0.025)	(0.020)	(0.020)
Bid-Ask Spread	0.1	0.094	0.006	0.001	0.098	0.092	0.001	-0.004
	(0.126)	(0.123)	(0.113)	(0.111)	(0.125)	(0.122)	(0.113)	(0.111)
High Rep	-0.093	-0.091	0.06	0.067	0.148	0.141	0.227	0.221
	(0.377)	(0.367)	(0.190)	(0.181)	(0.442)	(0.431)	(0.225)	(0.215)
High Rep×CAC	0.089	0.082	0.053	0.05	0.121	0.12	0.078	0.074
	(0.143)	(0.142)	(0.089)	(0.086)	(0.171)	(0.169)	(0.095)	(0.092)
Risk	0.110***	0.116***	0.130***	0.135***	0.115**	0.121***	0.141***	0.145***
	(0.043)	(0.042)	(0.020)	(0.019)	(0.049)	(0.048)	(0.023)	(0.022)
Risk×High Rep	-0.141	-0.142	-0.07	-0.07	-0.144	-0.144	-0.072	-0.071
	(0.107)	(0.104)	(0.059)	(0.056)	(0.105)	(0.102)	(0.051)	(0.048)
Risk×CAC	-0.000	0.000	-0.006	-0.005	0.002	0.003	-0.005	-0.004
	(0.012)	(0.012)	(0.009)	(0.008)	(0.013)	(0.013)	(0.009)	(0.008)
Risk×High Rep×CAC	-0.086	-0.085	-0.051	-0.05	-0.083	-0.083	-0.048*	-0.047*
	(0.054)	(0.053)	(0.032)	(0.031)	(0.053)	(0.053)	(0.029)	(0.028)
Week Fixed Effects	No	No	Yes	Yes	No	No	Yes	Yes
Number of Observations	10,952	10,952	10,952	10,952	10,952	10,952	10,952	10,952
Number of Bonds	166	166	166	166	166	166	166	166
Adjusted R-squared	0.617	0.628	0.733	0.747	0.614	0.626	0.740	0.753

Notes: 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). 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. Fixed effects are either included ("Yes") or not included ("No"). 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 A1--DEFINITION OF VARIABLES

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

Notes: This table provides a detailed description of our variables. Data source is Bloomberg for all variables, except for yEU which is sourced from the ECB Statistical Data Warehouse, and 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.