Contingent Capital Trigger Effects: Evidence from Liability Management Exercises

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Abstract

This paper investigates the so called *liability management exercises* by European banks, which bear comparable effects to triggering contingent capital. I first explore the determinants of these exercises. I then study market reactions to these operations, and banks' economic performance following them. Debtors positively receive these exercises, while stockholders discriminate according to the terms of the operation. Moreover, banks implementing liability management exercises exhibit higher economic performance than the ones that do not. These findings point towards contingent capital offering an effective solution to the dilemma of bank capital regulation.

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1 Introduction

Outside of the United States, financial institutions are increasingly issuing contingent capital instruments as part of their balance sheet strengthening: issuances amount so far to more than USD200bn since 2009, and their rhythm has been increasing. Among these instruments, the most popular contract design consists of principal write-down bonds (55% of the issuances, (Avdjiev et al., 2015)), where the principal is written down if a trigger event, such as low capital ratio, is met. By contrast, US banks are not currently issuing this type of securities, as they do not obtain any form of regulatory capital treatment under US regulation.

Whether contingent capital securities, and specifically write-down bonds, represent an adequate solution to the bank leverage dilemma remains a vividly debated question among academics and regulators. This paper aims at empirically investigating the potential weaknesses and strengths of these securities in the light of a relevant episode of the recent financial crisis: the massive and highly discounted tender offers by banks of European hybrid bonds.

Principal write-down bonds present two main advantages over contingent convertible securities (CoCos). First, because their triggers are not dilutive to existing shareholders, they do not create a risk of "death spiral". Second, because they do not convert into equity, they are more suited to fixed income investor mandates, and limit the risk of fire sales following a trigger.

These instruments have however raised important concerns. They lead to a violation of the absolute priority rule: when the principal is written down, debt investors bear losses before equity-holders do. Banks may therefore be willing to protect their debt investors and avoid triggering them, for instance by selling assets or even raising equity, making them less efficient. A second concern, which is relevant to all form of contingent capital, is that a trigger would send a negative signal on bank balance sheet quality, which might exacerbate bank's difficulties instead of helping to solve them. In addition to

these potential weaknesses, the main objective of these instruments has also come under question: how effective are these instruments at improving banks' financial health?

I investigate these questions by focusing on the so-called bank liability management exercises during the recent financial crisis. In the heart of the financial crisis, numerous banks imposed losses on their subordinated debt-holders by simultaneously refusing to call them at par at the first call date, a departure from the traditional policy of issuers for these instruments, and by launching highly discounted tender offers. These operations allowed the banks to book consequent capital gains on their liabilities as Core Tier 1, therefore propping up their balance sheet. For instance, Banco Santander, the Spanish bank, increased by more than 4 billion euros its Core Tier 1 capital through these operations. These offers were done either through a cash tender, making them comparable to write-down bonds, or through an exchange offer, comparable to CoCos.

The paper has three main contributions. First, I show that non-bankrupt European banks decided to impose significant losses on subordinated debt holders, thereby obtaining additional core capital but violating the absolute priority rule. Under issuer's threat of extending the maturity of the instruments, investors tendered more than EUR 85bn of hybrid bonds, which allowed banks to increase their core tier 1 capital by more than EUR 30bn. This episode represents a counter-example to the widespread view that banks are reluctant to impose losses on debt holders, and therefore suggests that banks will not try to avoid write-down bond triggers. Looking at the characteristics of the banks that decided to trigger, I find that large and listed banks are the most likely to implement "write-down-type" operations, while low capitalized and bailout banks are more likely to implement "CoCos-type" operations.

The second contribution of the paper is to rule out concerns over the negative signaling value of write-down bond triggers. Liability management exercises are, for the most part, received positively by regular debt holders, although reactions from shareholders are more mixed. Stockholders react negatively to "CoCos-type" operations. Aggregating both debt and equity reaction, I find that overall these operations have led to an increase in banks'

enterprise value.

The third contribution consists in providing empirical evidence of positive and persistent economic effects for banks having used tender offers. Financial institutions that implemented these operations show significantly higher returns on assets, and this relative improvement is proportional to the increase in Core Tier 1. This effect is robust to controlling for government bail-outs and seasonal equity offerings, and is driven by a more preserved lending activity.

There are four main reasons why liability management exercises represent an adequate laboratory for investigating contingent capital in general, and principal write-down bond triggers in particular. First, because banks were using the threat of never calling these perpetual securities, and also had the discretion not to pay coupons, investors were largely forced to accept these offers to avoid being kept in an illiquid and highly subordinated position. Their situation was therefore comparable to that of contingent capital investors facing a trigger. Second, the impact on banks' financial statements is very similar to the ones of a principal write-down bond trigger: the capital gain on the tender is booked as an increase in core Tier 1, the highest quality of regulatory capital. The majority of these tenders were funded with cash, which correspond to a permanent write-down, with no participation in a potential future upside. Third, this episode was conducted at a large scale: investors have tendered more than EUR 87bn of hybrid bonds, which allowed banks to book EUR 30bn of capital gain. Fourth, the discretionary nature on the issuer side of these transactions - the decision not to call the instrument and simultaneously launching a tender offer - allows us to study revealed preferences from banks regarding contingent capital instrument terms and trigger conditions.

For the purpose of my analysis, I build a unique and comprehensive database of liability management exercises from banks' websites and broker coverage reports and match this data with issuer financials, as well as CDS and share prices. In terms of methodology, I use logit regressions on liability management exercises to identify the type of financial institutions that implemented these operations. I then implement an event

study methodology on hybrid bond issuer stocks and CDS prices to identify the market reaction to these exercises. I calculate abnormal returns associated to these events for both CDS and stock price, and infer the aggregate enterprise value effect based on balance sheet data. In a following step, I implement a difference-in-differences analysis for measuring the impact of liability management exercises on economic performance. Although contingent debt relief is discretionary, I limit potential self-selection biases for my treatment group by using a control group obtained through propensity score matching. The propensity score is calculated on variables that capture the exposure to regulatory capital constraint.

This paper relates to several fields of the literature. First, this work broadly relates to the questions of bank capital structure (Admati et al., 2011; DeAngelo and Stulz, 2013), bank debt overhang (Admati et al., 2012), and behavior of distressed financial institutions (Acharya et al., 2013b). More specifically, this paper brings empirical evidence to the debate on contingent capital instruments as an effective alternative to raising common equity requirements to reduce bank credit risk, and provide insights on how contingent capital instruments would perform in practice. The theoretical literature on this topic is abundant but provides both arguments in favor of these instruments (Pennacchi et al., 2011; Martynova and Perotti, 2012; Zeng, 2012; Flannery, 2010; Duffie, 2010) and against them (Sundaresan and Wang, 2013). On the other hand, empirical work remains scarce. The closest work to my study is that of Avdjiev et al. (2015), who explore the effects of the *issuances* of contingent capital instruments on bank funding cost.

Second, this study builds on the knowledge of subordinated debt and Trust Preferred Securities in the US (Krishnan and Laux, 2005; Benston et al., 2003; Boyson et al., 2013).

Third, my work contributes to the literature on financial innovation. An established literature studies the impact of innovative assets such as securitization on bank balance sheets (Loutskina, 2011), but my work underlines the importance of innovative liabilities. Although some financial innovation may be driven by adverse incentives (Pérignon and Vallée, 2013), contingent capital instruments illustrate how financial innovation can create value (Perez-Gonzalez and Yun, 2013), and how innovative instruments on the liabilities

side of the balance sheet may help prevent future financial crises (Haliassos, 2012). In addition, innovative liabilities can also complement lines of credit to help solving corporate roll-over risk (Acharya et al., 2013a).

This paper is organized as follows: Section 2 provides background on the European market for hybrid bonds and the mechanisms of debt relief, and Section 3 presents the dataset built for the empirical analysis. Section 4 develops the hypotheses for the empirical analysis. Section 5 documents the magnitude of contingent debt relief and identifies the characteristics of contingent debt relief users. Section 6 studies the market reaction of both equity and debt holders to liability management exercises, while Section 7 analyses the economic performance of issuers that have triggered permanent debt reliefs. Section 8 concludes.

2 Hybrid Bond Market Background and Liability Management Exercises

2.1 The European Hybrid Bond Market in the Run-up to the Crisis

In 1998, the Basel committee modified its bank capital rules by clarifying its position concerning hybrid instruments and their eligibility as regulatory capital.[1] This announcement followed an increasing number of innovative hybrid instrument issuances: fixed income instruments with repayment in 5 to 10 years, which granted them coupon tax deductibility, but embedded an option to postpone repayment for a very long horizon or even until perpetuity. This option allows transforming debt-like security into loss absorbing claims quasi-similar to preferred shares: non-compulsory coupon payments, infinite maturity and no voting rights. The tax deductibility, the absence of covenants, and the non-dilutive nature of these instruments made them an attractive alternative to equity for banks.

[1]Source: www.bis.org/press/p981027.htm.

When marketing the hybrid bonds to investors, issuers strongly hinted at their determination to always honor the call option and to repay the bond in full as soon as the first call date would be reached. Around 40% of the hybrid bonds also include a commitment device in the form of a step-up clause: the coupon increases by a pre-determined margin when the repayment is postponed.[2] Calling hybrid bonds at the first call date was the standard practice before the financial crisis. No exception occurred until the end of 2008, nor was there any expectation of non-calls, as can be inferred from security prices at issuance. Thus, Moody's (2009) writes: "Prior to the financial crisis, there was a tacit agreement between an issuer and investors that hybrid and subordinated debt would be called at the first call date".

Hybrid bonds gained investor interest as they offered higher yields than senior bonds, due to their junior status that rank them senior only to equity. Fixed income funds were allowed to invest in hybrid bonds, and hybrid bonds became a popular investment among fixed income asset managers seeking to increase fund performance.[3] Retail investors are also increasingly attracted to these types of subordinated instruments, as they appreciate the fixed coupon format and the issuers' reputation. The development of EUR 1,000 denominated bonds, vs. EUR 50,000 and EUR 100,000 denominations targeted at institutional investors, made it easier for retail investors to access the hybrid bond market. When assessing financial institutions' creditworthiness, rating agencies classified hybrid bonds as equity, which also fostered hybrid bond market development. The market has met a strong growth since its inception, with issuances rising from EUR2bn in 1998 to EUR105bn in 2008. Figure 1 shows the number of hybrid bond issues by quarter, as well as their initial maturities if bonds are called at first call date.

[INSERT FIG 1]

[2]A step-up clause typically switch the coupon from fixed rate to variable rate and increases the coupon credit margin by 100 bps after the first call date, which often led to lower coupons than the initial ones during the financial crisis.

[3]Deutsche Bank research desk writes "Real money managers are the largest buyers of T1 [bonds]"(Bhimalingam and Burns (2011)).

2.2 Liability Management Exercises

When the crisis hit and refinancing costs surged for financial institutions, banks reconsidered their call strategy. The watershed event was on December 16, 2008, in the midst of the financial turmoil: Deutsche Bank announced that it was not calling its Lower-Tier II Notes with first call date on January 2009. This first announcement of a non-call of a hybrid bond took many investors by surprise, and was poorly received by market operators, with some investors threatening to cease subscription to any future debt and equity issuance from Deutsche Bank.[4] Following this announcement by one of Europe's leading banks, not calling hybrid bonds became increasingly frequent in 2009 and the following years. Despite the initial threats from investors, banks that have chosen not to call were not sanctioned when raising new debt, as illustrated by Deutsche Bank following issuance being oversubscribed.

Starting in summer 2009, European financial institutions implemented so-called liability management exercises by simultaneously not calling their hybrid bonds and launching tender offers on them.[5] The non-call, whether anticipated or not, typically leads the bond to trade at a significant discount, as investors become the holder of a deeply subordinated perpetual bond with non-compulsory coupons during a time of stress. The tender offer is thus realized at a significant discount which allows the financial institution to book the difference between nominal and tender price as a capital gain. The tender gain feeds into Core Tier 1 capital, and transfers wealth from affected hybrid bond holders to other debtors and shareholders. Precisely measuring the magnitude of this transfer is possible as it corresponds to the accounting gain booked by the issuer as a result of debt relief. The issuer can offer payment in cash through a cash tender, or in new securities through an exchange offer for either stocks or bonds. Figure 2 illustrates the balance sheet effects

[4]For instance, Bank of China writes in a letter to every European bank following Deutsche Bank decision: "any non-call by a given institution will result in that institution's debt (not just lower tier 2 but senior and tier 1 as well) being ineligible for future investment consideration ". Source: http://www.independent.co.uk/news/business/news/bank-of-china-furious-at-deutsche-debt-move-1207511.html.

[5]Explicit reference to non-call policy appears in the majority of offer announcement. Source: Barclays Research.

of LMEs.

[INSERT FIG 2]

2.3 Comparing with Second-Generation Contingent Capital Instruments

A close parallel can be drawn between Liability Management Exercises (henceforth thereafter LMEs), and the two most issued forms of contingent liabilities. Table 1 compares the impact of the two types of LME. Cash tender offers are economically similar to principal write-down bonds, as they allow to book an immediate gain while having to provide only a fraction of bond nominal in cash to investors.

Exchange offers are comparable to Contingent Convertibles (CoCos), as the immediate capital gain at trigger comes with the remaining fraction of nominal being exchanged into new securities, possibly stocks.

Although the discretionary nature of tender offers for both issuers and investors might question the relevance of this episode for automatic-trigger instruments, there are two reasons why lessons learnt from LMEs should be portable to new generation instruments. First, although investors can choose not to subscribe to the offer, they are eager to use the liquidity the exercises provide, even more so as the instruments' maturity is extended. Banks are in a strong bargaining position that makes them able to impose losses on investors. Second, even with automatic trigger instruments, banks keep some discretion on whether they let the instruments trigger. In the case of capital ratio triggers, banks can indeed decide to sell assets that use regulatory capital, or they can issue equity to stay above the ratio threshold.

[INSERT TABLE 1]

2.4 Comparing Europe and the United States

There has been almost no occurrence of liability management exercises by US Banks, despite the existence of largely comparable subordinated debt, *Trust Preferred Securities*. This lack of LMEs is likely to come from relatively higher trading prices, often above par, which leads them to be typically called at par at first possible date. Some issuers used the regulatory call clause to call earlier these bonds at par and refinance with cheaper securities.[6]

Following the financial crisis, the majority of US bank Trust Preferred Securities (TPS) traded above par due to bail-out guarantees and a more protective legal documentation that discouraged non-calls. TPS are cumulative and include a dividend stopper clause, meaning that US investors are better protected against non payment of coupon and principal than European ones.[7] This effect, combined with a sharper decrease in interest rates is likely to have limited TPS trading discounts.

Although LMEs seem very limited in the US (Boyson et al. (2013)), there exists evidence of some use of open market purchase, as well as maturity extension of a minority of trust preferred securities.[8] American banks such as JPMorgan or Citigroup have been steadily calling their USD denominated Trust Preferred Securities, while not calling their EUR denominated hybrid bonds. This segmented strategy could also be driven by reputation concerns.

Another important difference between the US and Europe, is that US banks are not currently issuing contingent capital instruments, as US regulators do not provide favorable regulatory capital treatment. Obtaining debt-type tax treatment for contingent capital might also prove difficult under the current US tax regime.

[6]The regulatory call clause allows issuer to call at any time at par if the instrument loses regulatory capital treatment. This clause is present in the documentation of all Trust Preferred Securities and hybrid bonds. The regulatory calls were made possible by the implementation of the Dodd Frank Act, which changed the regulatory treatment of TPS securities.

[7]Cumulative coupons means that any skipped coupons are accumulated to be paid in the future, at the latest at redemption date. Under a dividend stopper, the issuer cannot for a specified period of time, usually known as the *stopper period*, pay a coupon on another security or class of securities, typically stocks, if it does not pay a coupon on the security in question.

[8]http://seekingalpha.com/article/515731-is-your-preferred-stock-about-to-be-called

However, US banks' new resolution system of single point of entry actually represents a mechanism similar to *gone-concern* contingent capital. This resolution system might be a precursor of further development of contingent capital instruments in the US.

3 Data

For the purpose of my empirical analysis, I hand collect data on liability management exercises, which I complement with a comprehensive dataset that covers hybrid bond issuance, bank financial statements, and bank CDS and share prices.

I first hand collect press releases from issuers and reports from bank research desks detailing Liability Management Exercise. For each offer, I collect from these public releases the offer date, price, payment type (cash, senior debt, subordinated debt, new hybrid or equity), the amount tendered, and calculate the consequent accounting gain. This hand collected data covers the period 2008-2014. I merge this information with the issuance characteristics using each hybrid bond ISIN code. I also merge this issuance level dataset with hybrid bond secondary trading prices with the same identifier. Some LMEs may not be included in this study. I limit this concern by comparing my events list with the ones published by bank research teams, and typically have a larger sample.[9]

I then compile a dataset of the whole universe of hybrid issuances in Europe over the period 1998 to 2012.[10] I extract the characteristics of every hybrid bond issuance over the sample period from Dealogic DCM Analytics and Bloomberg. I merge these two sources using each bond's unique ISIN identifier. I complement this data with hand-collected information from issuers websites and broker reports.

As required for my event study and economic performance analysis, I associate the issuance level data gathered in the previously described steps with issuer level data. I

[9]Furthermore, not including some events can only bias against finding treatment effects, as some treated financial institutions would be mistakenly included in the control group.

[10]European countries included in the analysis: Austria, Belgium, Cyprus, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Slovenia, Spain, Sweden, Switzerland, United Kingdom.

manually identify subsidiaries and SPV issuers with their holding company. I then collapse LME data at the holding company-year level, using name and country as an identifier.

I then merge manually by name and country the liability management data with issuer senior and subordinated CDS spreads and stock prices from Datastream. Finally, I integrate balance sheet information from Bankscope through another manual merger by name of holding company. I convert variables of interest of Bankscope into euros.[11] This process results in a unique and reliable dataset that covers LMEs, issuance characteristics, issuer financials, as well as related security prices.

4 Hypotheses

The purpose of this paper is to analyze the potential effects of triggering contingent capital instruments through the lens of liability management exercises. I develop three main null hypotheses that I subsequently test in the data.

The first hypothesis is that banks might be inclined to avoid triggering contingent capital instruments, because they are unwilling to impose losses on subordinated bondholders, or because they fear sending a negative signal about the quality of their balance sheet. Banks might be reluctant to impose losses on bondholders out of reputation concerns, to ensure being able to tap again this investor base, or because banks are worried it could harm other business they are conducting with these investors. The empirical prediction associated with this first null hypothesis is that we should observe few liability management exercises, and that they should be restricted to banks who had no alternative to implementing them.

The second null hypothesis is that triggering contingent capital instruments indeed sends a negative signal to investors, and therefore has a detrimental impact on bank value. The empirical prediction is that LMEs should be associated with negative reactions from both debt holders and shareholders. In case that a large transfer from one group

[11] I only keep variables from Bankscope with a sufficient coverage and reliability, which I cross-check on a subsample of annual reports.

of investors to another is happening, I should still observe a negative effect on aggregate value. The enterprise value change can be calculated by value-weighting the stock price reaction and the CDS price reaction. Table 4 summarizes the predictions on debt, equity and enterprise value for a negative signal effect, as well as for two alternative effects: relaxing regulatory capital constraint, and reducing risk-shifting incentives. A contingent capital trigger might help releasing a binding regulatory capital constraint, and hence may allow financing additional projects with a positive net present value. On the other hand, contingent capital triggers may decrease risk-shifting incentives by realigning shareholders' incentives with those of debt holders.

[INSERT TABLE 4]

The third null hypothesis is that triggering contingent capital instruments does not improve banks' financial health and economic performance. Empirically, this means that key indicators such as return over assets and lending activity banks should not be impacted following LMEs. While the ideal experiment would exogenously impose LMEs to a subset of banks, a propensity score matching on observable characteristics is a first step towards causal identification.

5 Usage of Liability Management Exercise

5.1 Summary Statistics

I first explore the hand-collected data on liability management exercises by European banks. Table 2 presents summary statistics of their main characteristics.

The table shows that these exercises have been widespread, with more than 60 issuers implementing them, and that they have been massive: I identify a lower bound of EUR 86bn of bonds tendered. The related capital injection is also economically significant. Banks booked around EUR 30 billion of additional Core Tier 1 capital through these exercises. For instance, Banco Santander managed to gain more than EUR 4bn from such

an operation. The magnitude of these operations should lead to empirically measurable effects. These operations also illustrate that non-defaulting banks are not reluctant to impose significant losses on their subordinated debt investors. Cash tenders, which are similar to write-down bonds, appear to be more popular than exchange offers.[12]

[INSERT TABLE 2]

5.2 LME Users

I then explore the cross-section of banks to identify which bank characteristics are associated with implementing LMEs.

Table 3 presents the result of logit regressions on implementing LMEs. The left hand side variable in the regressions is an indicator variable equal to one if the issuer has implemented a LME during the period 2008-2014. The analysis is conducted on a single cross-section, with financial data prior to the crisis (as of end 2007).

These regression coefficients suggest several drivers for implementing a LME: bank size, bank capitalization, being a listed company, and being bailed-out.

Considering all LMEs together in column 1, I find that Tier 1 ratio, the principal regulatory capital ratio under Basel II, is indeed negatively correlated with the likelihood of implementing LMEs. Banks are therefore likely trying to maintain or increase their amount of capital with these operations. Large banks, listed banks and bailed-out banks also appear significantly more likely to implement a LME. I explore separately the likelihood of implementing "Write-down-type" LMEs in column 2, and "CoCo-type" LME in column 3. I observe some significant differences in the coefficients of the explanatory variable. While large and listed banks are likely to implement "write-down-type" LMEs, bailed-out banks, and banks with a low share of deposits in their balance sheet are more likely to implement "CoCo-type" LMEs.

This suggests distinct motives for these two types of operation. Exchange offers are

[12]Some LME offer the choice to investors between a cash payment or an exchange into another security.

often imposed by regulators as a way to improve capitalization without any redistribution of cash outside the bank. However, shareholders might be unhappy about the potential dilution if the exchange is made in stock, while debt holders might not like exchange in debt that is more senior to their claim. Exchange offers are therefore implemented in situations closer to *gone-concern*. On the other hand, cash LMEs appear to be more frequent for listed banks, while the level of bank capitalization appear to be less important as a driver. These operations might therefore correspond to their willingness to improve Core Tier 1 ratio as much as possible, even in the absence of going concern, as this ratio is increasingly scrutinized by shareholders since the financial crisis.

[INSERT TABLE 3]

These results also allow us to mitigate an additional concern over triggering contingent capital: that banks try to avoid imposing losses on their subordinated debt holders thereby jeopardizing their relationship with them, for instance in terms of cross-selling. Large banks, which are also the better positioned for cross-selling, do not seem reluctant to implement these operations.

6 Market Reaction to Liability Management Exercises

This section tests whether a liability management exercise sends a negative signal on bank type.

I study the market reaction to liability management exercises for both bondholders and shareholders by implementing an event-study methodology (Brown and Warner, 1985; MacKinlay, 1997). I use CDS spreads to measure debt value reaction because CDS are more liquid than bonds. [13] For the equity value reaction, I examine stock prices. Combining the effects on debt and equity, I observe the aggregate effect on bank enterprise

[13] This methodology is used for instance in Jorion and Zhang (2007).

value for the subset of banks that are both listed and have CDS on their debt. If assuming semi-strong form efficiency, market reaction is only driven by information made public at the time of the debt relief announcement. Although a small number of liability management exercises were made in conjunction with other issuer specific news, the large majority of them were announced independently from any other corporate events, as observed on issuer press releases.

I calculate adjusted returns of CDS as the change in a given issuer spread minus the change in its benchmark index. The benchmark index is the iTraxx Financial Senior for the senior CDS and the iTraxx Financial Sub for the subordinated CDS. This adjustement is comparable with the rating adjusted spread used in Jorion and Zhang (2007). Stock abnormal returns are calculated based on the CAPM model, using Eurostoxx 50 as the market index. Stock betas are estimated prior to the debt relief events, over a window of 200 days starting on January 1st, 2008.[14] Cumulative abnormal returns are the sum of abnormal returns over the considered windows: over a -1/+1 day window.

Table 5 presents the mean cumulative adjusted returns of CDS and the mean cumulative abnormal returns of stock price to liability management exercises.

The result is that LMEs have a tightening effect on issuer CDS spreads, meaning investors perceive issuer credit quality to be improved. The effect on issuer CDS spread is statistically and economically significant for both senior and subordinated CDS.[15] The larger magnitude of subordinated CDS reaction is consistent with these securities being more information sensitive than senior CDS, and less influenced by too-big-to-fail government put options. This positive reaction from debt investors is consistent with the deleveraging effect LMEs provide.

However, the average stock price reaction to LMEs appears to be significantly negative. To dig further into this negative stock reaction, I look separately at LMEs implemented

[14]Results detailed below are robust to using stock adjusted returns, calculated by subtracting the benchmark index performance to the stock performance.

[15]Tender offers might decrease the liquidity of some of the underlying bonds. Such an effect would not necessarily affect the CDS prices, and if it did it would bias against finding a tightening reaction, as an overall decrease in liquidity would widen the CDS spreads.

through cash tenders, and the ones implemented through exchange offers. This analysis evidences that while debt holder reaction is comparable for both types of operations, the negative stock reaction is concentrated in the exchange operations. This is consistent with the dilutive nature of the exchange that is implemented against equity.

[INSERT TABLE 5]

Aggregate Effect

To fully rule out negative signaling of LMEs, I need to study the aggregate change in the enterprise value following these operations. I use the following methodology. I assume that the value of deposits is not affected due to government guarantees, and that only debt and equity value is affected by these operations. I calculate the value weighted duration of bank debt using debt breakdown by maturity provided in annual reports. I then estimate senior debt value variation as the product of senior debt duration multiplied by minus the senior CDS reaction, and subordinated debt value variation by subordinated debt duration multiplied by minus the subordinated CDS reaction. I then calculate the value weighted reaction of debt and equity, which gives me the aggregate effect. Results are also displayed in Table 5.

I find that liability management exercise that were implemented through cash tenders are associated with a significant increase in enterprise value, while exchange offers appear to have an insignificant effect on aggregate value. This estimated aggregate effect is hard to reconcile with a negative signal from LMEs, especially for the write-down type.

7 Economic Effects of Liability Management Exercises

The final step of my study is to assess whether liability management exercises have an impact on the subsequent economic performance of banks, and whether this effect is consistent with market anticipations.

7.1 Impact on Economic Performance

I estimate the effects of LMEs on economic performance in a difference-in-differences set up. The treatment consists of LMEs that occurred between 2009 and 2011. I use three different control groups of untreated financial institutions: first, all hybrid bond users for which financial data is available in Bankscope, which corresponds to financial institutions that were in a position to implement permanent debt reliefs, second, all financial institutions that used non-calls, and finally the financial institutions that have implemented permanent debt reliefs in 2012, but not before. Summary statistics of key financial variables are presented for the different subsets in the Appendix.[16] I estimate the following model on yearly financial data ranging from 2007 to 2011:

$$Return\ on\ Assets_{i,t} = a + b.\ Post \times Treated_{i,t} + c.\ Treated_i + d.\ Bank\ Characteristics_{i,t} + Year\ FE_t + e_{i,t}$$

where *Treated* is a dummy variable for having a LME in any year, $Post \times Treated$ a dummy variable for having a LME during this given year or a previous year. I control for not calling hybrid bonds and seasonal equity offering with dummies for such events. Regressions also include controls for previous accounting exercise total assets, Tier 1 capital ratio, impaired loans over equity, amount of hybrid bond, client deposits over total funding, risk weigthed assets over total assets, and yearly change in total assets, as well as a dummy variable for being publicly listed, and year fixed effects. Standard errors are clustered by issuers.

Results are presented in Table 6. LMEs are associated with a relatively higher economic performance. The positive and significant coefficient on the dummy for LME shows that these actions have a positive impact on return on assets (ROA). This result is robust to a battery of controls, and holds for all three control groups. This effect is economically significant: regression coefficients indicate an improvement of ROA between 0.6% and 1.0% according to the control group.

[16] Banks from the treatment group are on average larger and more frequently listed than for the control group

To confirm the validity of this result and limit concerns over unobserved variables to factors correlated with the size of the associated capital injection, I then interact *post* × *treated* with the capital gain obtained through the LME, as a percentage of total assets:

$$Return\ on\ Assets_{i,t} = a + b1.\ post \times treated_{i,t} + b2.\ post \times treated \times gain_{i,t} + c.$$
$$treated_i + d.\ Bank\ characteristics_{i,t} + Year\ FE_t + e_{i,t}$$

Results appear in columns (B), (D) and (F) of Table 6 for the three control groups. The larger the LME, the more it impacts the ROA of the affected financial institution. Again, a battery of controls, year fixed effect for example, also leaves the coefficients of interest significant. This coefficient mitigates concerns that unobserved variables are driving the previous results, as these variables need to be correlated with the size of the capital gain obtained through the LME.

This higher economic performance for financial institutions that implemented LME is consistent with the initial hypothesis that these actions help relax the regulatory capital constraint. By providing a gain in difficult times and allowing financial institutions get adequate capitalization when needed, LME can help avoid discounted fire sales or renouncing to positive NPV projects.

Moreover, the positive correlation between LME and economic performance makes reverse causality unlikely to drive the result. If at play, potential endogeneity would go against finding positive effects of LME, as the capital gain relates to how discounted hybrid bonds are, and therefore to how distressed the financial institution is. Therefore, potential self-selection would bias the treatment group towards having more banks in financial trouble than in the control group, which makes them consequently unlikely to exhibit relatively higher economic performance. Controls for key financial ratios should also limit this concern to unobserved variables. I further address and discuss the self-selection issue in the additional robustness checks at the end of this section.

Seasonal equity offerings do not appear to be significantly correlated with economic performance measured as return on assets. Controlling for the change in balance sheet size is important to make sure that the improved economic performance is robust to asset sales, and does not come from concentrating operating income on a smaller asset base.

[INSERT TABLE 6]

7.2 Inspecting the Transmission Mechanism

Understanding the channel through which contingent instruments improve economic performance is key for assessing their relevance and efficiency. If these instruments help reduce regulatory capital constraint, financial institutions that have triggered LMEs should exhibit a smaller decrease in lending, as well as a higher performance of this activity. Reducing the regulatory capital constraint should allow financial institutions to finance relatively more positive-NPV projects. Using the same set up as in Table 6, I test these predictions by looking at the impact of LMEs on the asset side of the balance sheet and on interest income. I estimate the following specification:

$$Y(i,t) = a + b.\ post \times treated + c.\ treated + other\ events\ control + Bank\ characteristics(i,t) + year\ FE\ (t) + e(i,t)$$

where Y(i,t) is successively log(Loans), Risk-Weigthed Assets over Total Assets, and Interest Income over Total Assets. I consider two control groups: hybrid bond issuers, and non-call users.

Table 7 displays the results. LMEs appear to impact the quantity of loans retained. When looking at asset composition, I find that treated financial institutions keep a higher ratio of risk-weighted assets over assets. These results show that, on average, treated financial institutions stay more invested in risky assets during the financial crisis. This difference in asset composition translates into higher interest income, as exhibited by the positive and significant coefficient on $Post \times Treated$ in columns (C) and (F). These

effects are robust to restricting the control group to non-call users. Altogether, these results corroborate the role of LMEs in relaxing the regulatory capital constraint and its pernicious effects on lending in times of distress.

[INSERT TABLE 7]

7.3 Economic Effects: Robustness

Self-selection

A natural concern about comparing the economic performance of LME users with the one of a control group is the self-selection bias. Conditionally on having issued hybrid bonds, financial institutions decide themselves to be treated due to the discretionary design of the trigger. This decision might be correlated with important variables that drive economic performance. To address this concern, I implement a propensity score matching to alleviate self-selection concerns. This high comparability comes however at a cost of a somewhat lower statistical power, as it decreases the sample size. The propensity score matching methodology allows to rule out endogeneity on past observable variables included in the logit analysis of the propensity score. This set-up therefore restricts endogeneity concerns to unobserved time-varying variables.

Table A2 in the Appendix presents the same specifications as Table 6 and Table 7, with the control group built by using propensity score matching. The propensity score is calculated on the following variables with their 2008 value: total assets, Tier 1 capital ratio, client deposits over total funding, impaired loans over assets, risk-weigthed assets over total assets, yearly change in total assets, as well as a dummy variable for being publicly listed. I take the closest five non-treated financial institutions for each treated financial institution, with possible replacement to maximize comparability. These replacements happen frequently, which explains the small size of the control group.

Both economic performance and balance sheet composition effects are confirmed by this additional robustness test. I use return on assets, log(Loans) and Risk Weighted

Assets over Total Assets as left hand-side variables. The coefficient on the interaction dummy $Post \times Treated$ is significantly positive in all three specifications. The coefficient on the triple interaction terms $post \times treated \times gain$ in column (B) also bears a positive coefficient, which reinforces the validity of the result, as unobservable variables need to be correlated both with treatment timing and size to create endogeneity.

A change in regulatory framework that fostered tender offers from mid-2010 mitigates endogeneity concerns on unobserved variables. As part of the Basel III standards implementation, the Basel Committee on Banking Supervision's announced on September 10, 2010 new standards for hybrid instruments to be included in regulatory capital.[17] For the vast majority, existing hybrid bonds did not comply with these new standards. This regulatory change led to an increase in the incentive to repurchase or exchange existing bonds for issuers, as opposed to only postponing their repayment. When a hybrid bond loses regulatory capital classification, it becomes less attractive for the issuer. This shock covers all financial institutions and therefore cannot be convincingly used in a difference-in-difference setting or an instrument variable analysis. However, its regulatory nature supports a significant exogeneity of the trigger for LMEs to the bank unobservable characteristics. Tender offers are significantly more frequent after the regulatory change than before.

Government Bail-Outs

Several financial institutions that implemented LMEs also benefited from government bail-outs. An alternative hypothesis is therefore that the observed positive effects of LMEs on economic performance may be driven by the subsample of banks that benefited from government bail-outs. A capital injection from taxpayer money, while potentially creating governance issues, may help reduce the regulatory capital constraint.

To rule out this alternative explanation, I conduct the same OLS analysis as in Table 6,

[17]The main requirement announced was to increase the loss absorption mechanism of hybrid instruments, namely by making nominal write-off or conversion into equity automatic below a pre-specified trigger, and to avoid any incentive to redeem the securities prior to their maximum maturity.

keeping the variables related to LME, but I add a dummy for banks that were beneficiaries of a government-sponsored bail-out (henceforth, the bailed-out banks), as well as an interaction between being a bailed-out bank and being post bail-out. The online appendix shows the list of bailed out banks obtained from the European Commission website, that includes all financial institutions that have been the object of an individual aid. [18]

Table A3 in the Appendix shows that the positive effect of LME is robust to this additional control. I use the same control groups as in section 6. Column A corresponds to the control group of hybrid bond user, column B to non-call users and column C to the control group that implemented LME post sample period. While the selection effect appears to be strong for bailed out banks, with a significant negative coefficient on the dummy for bail-out, the treatment effect identified on the interaction term is not significantly different from zero. This contrasts with the results for LMEs: no apparent selection effect, but a significant treatment effect. The association of improved economic performance with LME is therefore robust to controlling for government bail-outs.

Country effects

LMEs are more frequent in some countries than others. The positive effect of LMEs may come from difference in trends between countries within Europe, which are unrelated to the events I am studying. Sovereign risk and state of the economy are the usual suspects. Countries from the periphery of the Euro-zone, such as Portugal, Italy, Ireland, Greece and Spain have been facing both an important risk of default from their central government and a fragile health of their economy. Scandinavian countries, on the other side, have been partly immune to the economic crisis and the related sovereign debt turmoil. To rule out this explanation, I include in the main specification of my analysis of economic performance dummies for these two geographic zones, that I interact with year fixed effects. Table A4 in the Appendix shows that the positive impact of LMEs remains valid in this robustness check.

[18] Source: http://ec.europa.eu/competition.

8 Conclusion

This paper explores the effects of liability management exercises to gain knowledge into the effects of triggering contingent capital instruments. I document that financial institutions massively implemented liability management exercises following the recent financial crisis, therefore imposing significant losses on their subordinated debt bond investors.

When conducting an event study on the dates of announcement of liability management exercises, I find that CDS spreads tighten significantly. This increase in debt value is likely to be driven by a reduction of regulatory capital constraint. The reaction of stock prices is more mixed depending on the type of operation. When looking at the aggregate effect, I find no evidence of a decrease in enterprise that a negative signal would predict.

Moreover, liability management exercises are associated with higher economic performance, and better preserved lending activity from their users. This result is robust to controlling for government bail-out and seasonal equity offering. I address potential endogeneity concerns due to self-selection of the treated group by using a propensity score matching on bank financials to constitute the control group.

My results bring some empirical substance to the discussion on the efficiency of contingent capital instruments. By limiting financial distress costs in times of stress, contingent capital may replace higher capital requirement at a cheaper cost for the economy.

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9 Figures and Tables

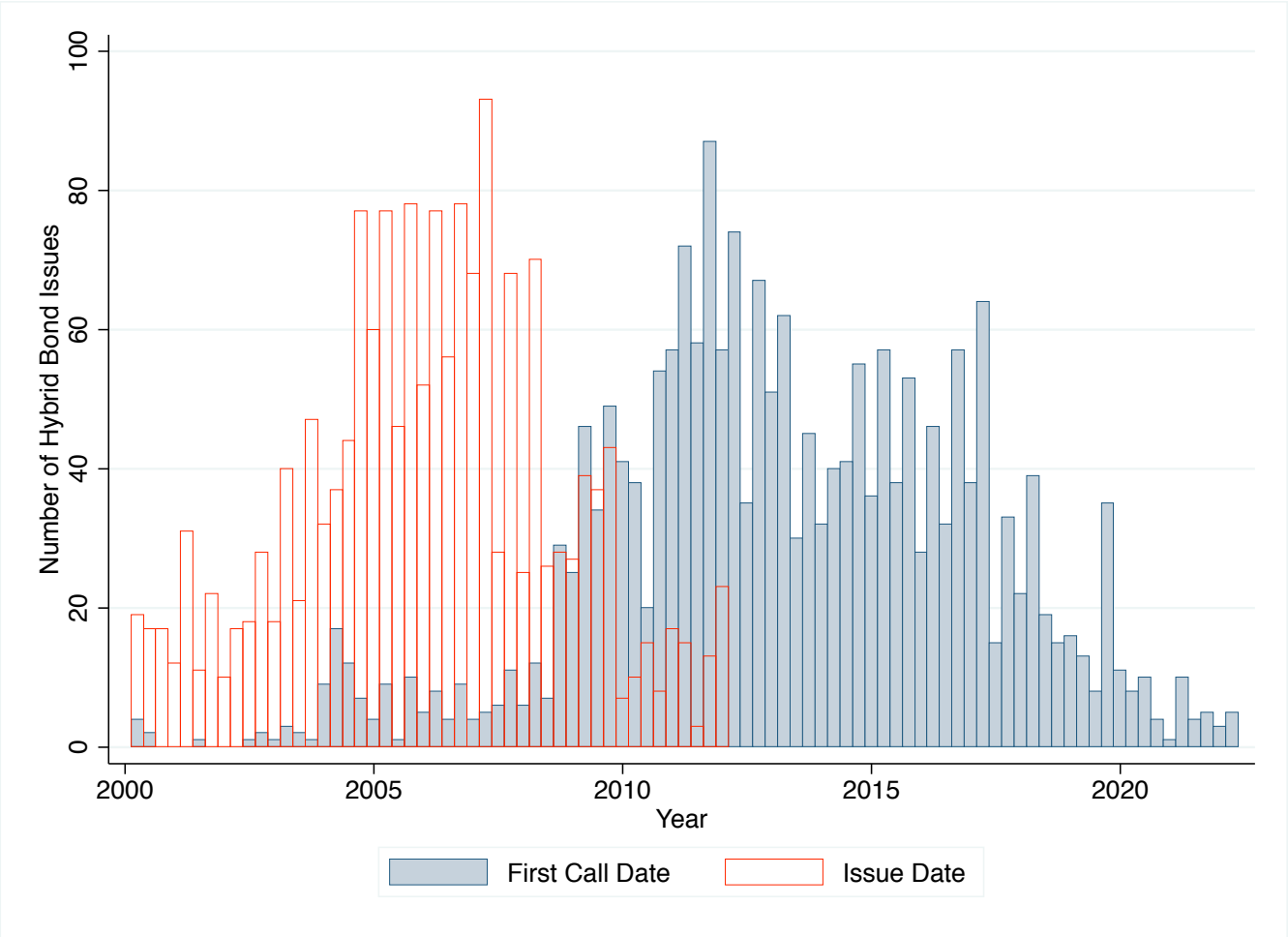

Figure 1: Issue Dates and First Call Dates of Hybrid Bonds

Note: This figure exhibits the number of hybrid bond issues and the number of postponement options by quarter. Source: Dealogic, Bloomberg, and company websites.

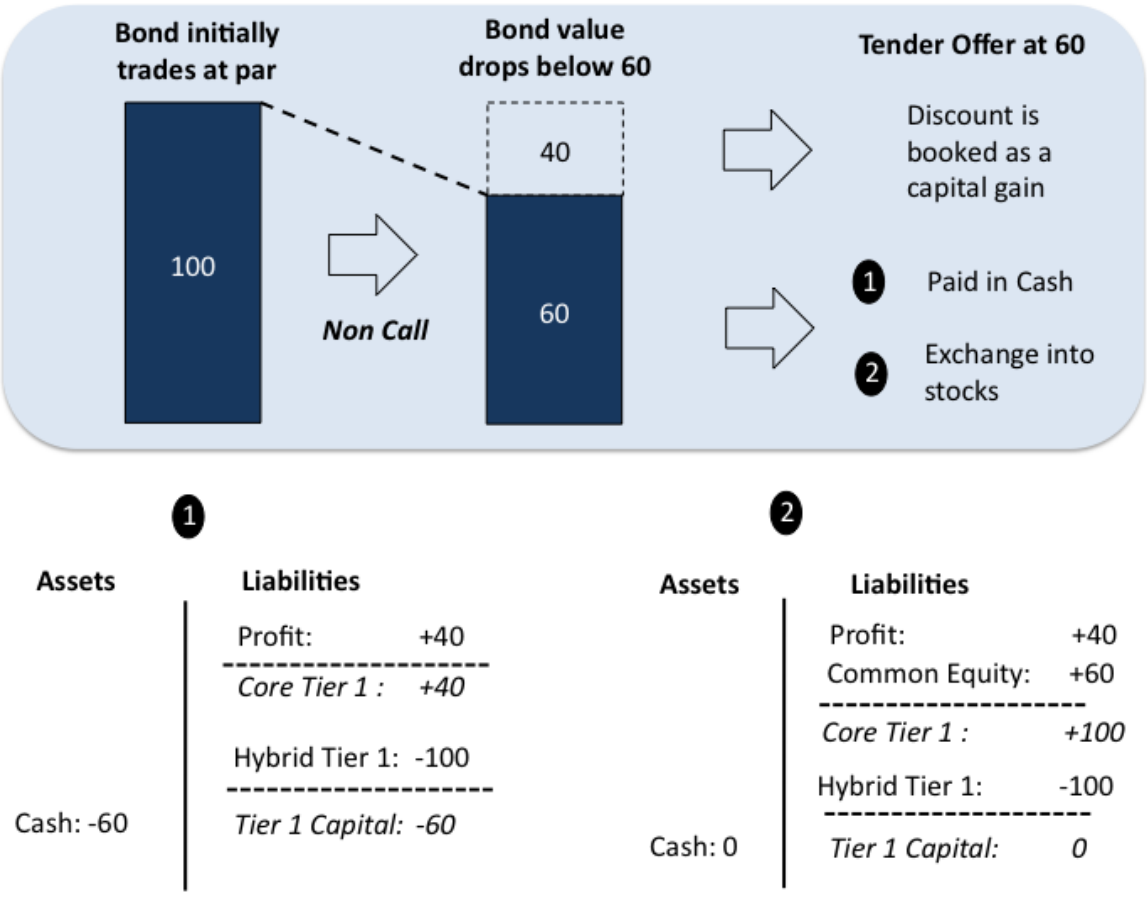

Figure 2: Liability Management Exercises: Balance Sheet Effects

Note: This figure displays an example of liability management exercise, with the operation mechanism and the associated balance sheet effects.

Table 1: Liability Management Exercises and Contigent Capital Instruments

	Liability Management Exercise		Contingent Capital	
	through Cash Tender	through Exchange (equity)	Write-Down Bond	Contingent Convertible (CoCo)
Capital Classification	Tier 1/2	Tier 1/2	Tier 2	Tier 1
Trigger	Discre-tionary	Discre-tionary / Regulatory	Capital Ratio + Regulatory	Capital Ratio + Regulatory
Impact of Trigger				
Impact on Common Equity (Core Tier 1)	+	++	+	++
Impact on Total Regulatory Capital	-	=	-	=
Equity holder dilution	No	Yes	No	Yes

Note: This Table details the different type of debt relief with their effect on liabilities. Cash and Exchange Tender offers coincide with the postponement of bond repayment. The numerical example is based on a hybrid bond with a EUR1bn notional amount, a 4% yearly coupon and a current refinancing cost of 7%

Table 2: Summary Statistics on Hybrid Issuances and Debt Relief

	All LMEs	Cash Tender	Exchange
Number of Issuers	52	42	27
Number of LMEs	92	60	43
Number of Issues	540	377	286
% Tier 1 (in amount)	44.2%	52.5%	35.7%
Average Offer Price	78.9	75.4	82.9
Total Amount Tendered	86bn	43bn	42bn
Average Amount Tendered (issuer level)	1.6bn	1bn	1.6bn
Max Amount Tendered (issuer level)	14bn	6bn	14bn
Total Capital Gain	28bn	16bn	12bn
Average Capital Gain (issuer level)	0.6bn	0.7bn	0.7bn
Max Capital Gain (issuer level)	4.8bn	4.2bn	4.8bn

Note: This Table displays summary statistics on liability management exercises (LME).

Table 3: Liability Management Exercise Usage

	LMEs	Cash Tender	Exchange
	(A)	(B)	(C)
Tier 1 Ratio	-0.666*	-0.485	-0.999***
	(-1.909)	(-1.569)	(-2.979)
Log(Assets)	1.116**	1.452**	0.326
	(2.533)	(2.389)	(1.062)
Bail Out	1.360**	0.495	3.040***
	(2.333)	(0.644)	(3.187)
Listed	3.870***	4.864***	3.296**
	(3.081)	(3.403)	(2.283)
Deposit / Liabilities	-0.191	-0.099	-0.997***
	(-1.542)	(-1.342)	(-4.606)
Bank Type	Yes	Yes	Yes
Other Controls	Yes	Yes	Yes
Observations	194	194	140
Pseudo R^2	0.580	0.585	0.512

Note: This Table presents logit regression coefficients on the use of liability management exercises. The left handside variable is a dummy variable equal to one if the financial institution has implemented at least one liability management exercise over the period 2009-2012. Financial data is as per 2008. Standard errors are clustered at the country level. T-statistics are displayed below their coefficient of interest.

Table 4: Predictions of Contingent Debt Relief Value Effects

	Relaxing Regulatory Capital Constraint	Negative Signaling Effect	Reducing Risk-Shifting Incentives
Debt Value	+	-	+
Equity Value	+	-	-
Enterprise Value	+	-	=

Note: This Table presents the predictions on debt and equity value for the three hypotheses developed in Section 5.

Table 5: Abnormal Return to Debt Relief Events

	Mean	T-stat	N
Liability Management Exercise			
Senior CDS change (bps)	-4.454*	-1.782	70
Sub CDS change (bps)	-13.710***	-3.368	65
Stock price change (%)	-1.363**	-2.832	53
Aggregate Effect (%)	0.108	0.650	33
Write-down Type LME: Cash Tender			
Senior CDS change (bps)	-6.351**	-2.160	51
Sub CDS change (bps)	-16.645***	-3.3857	45
Stock price change (%)	-0.856	-1.505	29
Aggregate Effect (%)	0.372*	1.840	18
CoCo Type LME: Exchange Tender			
Senior CDS change (bps)	-2.546	-0.690	36
Sub CDS change (bps)	-14.920**	-2.552	37
Stock price change (%)	-1.975**	-2.450	24
Aggregate Effect (%)	-0.208	-0.790	15

Note: This Table presents the average cumulative adjusted return of CDS and the mean cumulative abnormal return of stock price to debt relief events. Time windows are daily over -1/+1 days. Adjusted returns of CDS are calculated as the change in a given issuer spread minus the change in its benchmark index. The benchmark index is the iTraxx financial senior for the senior CDS and the iTraxx financial sub for the subordinated CDS. Stock abnormal returns are calculated based on the CAPM model, using Eurostoxx 50 as the market index. Stock betas are estimated in a window of 200 days, starting on the 1st january 2008. Cumulative abnormal returns are the sum of abnormal returns over the considered windows.

Table 6: Impact of Debt Relief on Economic Performance (ROA)

	Hybrid User		Non Call User		Tender User	
	(A)	(B)	(C)	(D)	(E)	(F)
Post x Treated	0.838***	0.551*	1.002**	0.736*	0.596*	0.352
	(2.66)	(1.66)	(2.46)	(1.68)	(1.83)	(0.95)
Post x Treated x Capital Gain		140.316**		114.121		114.406*
(% Assets)		(2.14)		(1.28)		(1.79)
Non-Call	-0.633**	-0.645**	-0.772**	-0.778**	-0.548**	-0.573**
	(-2.05)	(-2.07)	(-2.42)	(-2.42)	(-2.37)	(-2.47)
Seasonal Equity Offering	-0.192	-0.216	-0.153	-0.188	0.035	-0.010
	(-1.01)	(-1.09)	(-0.50)	(-0.58)	(0.22)	(-0.05)
Change in Assets	1.807***	1.807***	1.730**	1.728**	0.369	0.373
	(3.11)	(3.10)	(2.05)	(2.04)	(1.34)	(1.32)
Treated	0.025	0.033	0.071	0.087	-0.182	-0.166
	(0.15)	(0.20)	(0.32)	(0.38)	(-1.08)	(-0.96)
Other Controls	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Cluster	Issuer	Issuer	Issuer	Issuer	Issuer	Issuer
R^2	0.1478	0.1484	0.137	0.1375	0.3875	0.3949
N	684	684	318	318	126	126

Note: This table displays OLS regression coefficients where the left handside variable is Return On Assets (ROA) over the period 2007 - 2011. Treated is a dummy variable for having a debt relief in any year, $post \times treated$ a dummy variable for having a debt relief during this given year or a previous year, and $post \times treated \times CapitalGain$ the interaction term with the size of capital gain from the debt relief, expressed in % of total assets. I control for repayment postponement of hybrid bonds and seasonal equity offering with dummies for such events in a given year. Columns (A) to (D) present OLS regression analysis, while columns (E) and (F) present an IV analysis, where $post \times treated$ is the endogenous regressor. Regressions include controls for previous accounting exercise total assets, Tier 1 capital ratio, client deposits over total funding, impaired loans over assets, risk weigthed assets over total assets, and yearly change in total assets, as well as a dummy variable for being publicly listed. Standard errors are clustered at the issuer level. T-statistics are displayed below their coefficient of interest.

Table 7: The Lending Channel

	OLS Hybrid User			OLS Non Call User		
	Log(Loans)	RWA/ Assets	Int. Income/ Assets	Log(Loans)	RWA/ Assets	Int. Income/ Assets
	(A)	(B)	(C)	(D)	(E)	(F)
Post x Treated	0.167*	0.001**	0.003**	0.181**	0.001***	0.005***
	(1.91)	(2.16)	(2.03)	(2.62)	(3.03)	(2.75)
Non-Call	-0.067	0.000	0.002	-0.110**	0.000	-0.002
	(-0.70)	(0.82)	(0.92)	(-2.17)	(-0.24)	(-1.36)
Seasonal Equity Offering	-0.170	0.000	-0.000	-0.036	0.000	0.002
	(-1.42)	(0.65)	(-0.23)	(-0.29)	(1.50)	(1.04)
Change in Assets	1.491***	-0.000	0.003	0.994***	-0.001**	0.001
	(3.46)	(-0.69)	(0.92)	(3.11)	(-2.00)	(0.28)
Treated	-0.106	0.000	-0.001	-0.092	0.000	-0.002
	(-1.02)	(0.09)	(-0.50)	(-0.79)	(0.15)	(-1.21)
Other Controls	YES	YES	YES	YES	YES	YES
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Cluster	Issuer	Issuer	Issuer	Issuer	Issuer	Issuer
R^2	0.7003	0.5003	0.1407	0.8004	0.5329	0.222
N	710	678	710	329	316	330

Note: This table displays the coefficients of OLS regression, where the left handside variable is indicated in the column title. Non Op. Income / Assets means non operating income divided by total assets. Op Income / Assets means operating income divided by total assets. Int. Income / Assets is for interest income over total assets, and RWA / Assets stands for Risk Weighted Assets over total assets. Standard errors are clustered at the issuer level. T-statistics are displayed below their coefficient of interest.

10 Appendix

Product Example

The repayment postponement option is structured as a perpetual bond with call date to the issuer. The hybrid bond is issued directly by the financial institution, or through an offshore trust in a structure similar to the one used for Trust Preferred Securities in the US. As an illustration, below are the characteristics of an existing hybrid bond.

Issuer:	BNP Paribas
Issue amount:	EUR750m
Issue date:	April 11, 2006
Maturity:	Perpetual
Basel II Tier of Capital:	Tier 1
First call date:	April 12, 2016
Call:	at par
Notice Period:	30 business days
Coupon prior first call date:	4.73%
Coupon thereafter:	Euribor 3m + 1.69%
Ranking:	Deeply Subordinated
Coupon provision:	Non Cumulative
Denomination:	EUR50,000
Structure:	Direct Issuance

Table A1: Summary Statistics of Bank Financials

	Total Sample	Treatment Group	Control Group		
			Hybrid User	Non Call User	Tender User
Total Assets (in EUR m)	140,462	745,528	101,245	175,182	383,291
RWA / Assets	61.8%	49.0%	62.7%	64.5%	58.7%
Loans (in EUR m)	119,607	277,504	109,130	99,656	197,052
Hybrid Bonds (in EUR m)	2,390	17,100	1,450	2,780	6,570
Tier 1 Ratio	9.1%	7.5%	9.2%	8.2%	7.4%
Deposits / Total Debt	27.8%	23.8%	28.1%	33.0%	30.4%
Net Income (in EURm)	821	4,603	574	1,158	2,872
Return on Assets	1.0%	0.7%	1.0%	0.9%	0.8%
Return on Equity	13.0%	15.3%	12.9%	14.9%	21.0%
Listed	29.6%	78.6%	26.5%	36.5%	62.5%
N	233	16	217	74	16

Note: This table displays summary statistics for key financial variables of the banks analyzed in Section 6. Financials are as of end of 2007.

Table A2: Robustness with Propensity Score Matching

Panel A: Economic Performance		
	ROA	
	(A)	(B)
Post x Treated	0.383*	0.153
	(1.81)	(0.66)
Post x Treated x Capital Gain		114.849**
		(2.35)
Non-Call	-0.650**	-0.660**
	(-2.08)	(-2.11)
Seasonal Equity Offering	-0.052	-0.084
	(-0.35)	(-0.54)
Change in Assets	0.504	0.511
	(1.52)	(1.52)
Treated	0.074	0.068
	(0.40)	(0.37)
Other Controls	Yes	Yes
Year FE	Yes	Yes
Cluster	Issuer	Issuer
R^2	0.2502	0.2569
N	167	167

Panel B: Lending Channel			
	Log(Loans)	RWA/ Assets	Int. Income/ Assets
	(A)	(B)	(C)
Post x Treated	0.142*	0.001*	0.001
	(1.91)	(1.73)	(0.59)
Non-Call	-0.157	-0.000	0.001
	(-1.07)	(-0.24)	(0.87)
Seasonal Equity Offering	-0.091	0.000	-0.001
	(-0.91)	(-0.18)	(-0.96)
Change in Assets	0.588***	0.000	-0.002
	(3.37)	(0.21)	(-1.09)
Treated	0.100	0.001	0.002
	(0.73)	(1.45)	(0.96)
Other Controls	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Cluster	Issuer	Issuer	Issuer
R^2	0.8617	0.5853	0.5157
N	169	166	170

Note: This table displays the coefficients of OLS regressions, where the left hand side variables are Return on Assets (ROA), Log(Loans) and Risk Weighted Assets over Total Assets. Variables are as per Table 8 and 9. The control group is constituted using a propensity score matching methodology on using a contingent debt relief. The control group includes the five closest matches, with possible replacements. Standard errors are clustered at the issuer level. T-statistics are displayed below their coefficient of interest.

Table A3: Government Bail out effects vs. Contingent Debt reliefs

	Hybrid User	Non Call User	Tender User
	(A)	(B)	(C)
Post x Treated	0.702**	0.883**	0.563*
	(2.20)	(2.14)	(1.73)
Treated	0.481	0.621	-0.100
	(1.51)	(1.60)	(-0.51)
Post_b x Treated_b	-0.806	-0.824	0.500
	(-0.75)	(-0.61)	(1.48)
Treated_b	-0.703**	-1.171**	-0.570**
	(-2.51)	(-2.55)	(-2.27)
Non Call	-0.507*	-0.726**	-0.592**
	(-1.93)	(-2.52)	(-2.40)
Seasonal Equity Offering	-0.195	-0.080	0.029
	(-1.08)	(-0.31)	(0.17)
Other Controls	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Cluster	Issuer	Issuer	Issuer
R^2	0.1828	0.201	0.4224
N	684	318	126

Note: This table displays the coefficients of OLS regressions, where the left handside variable is Return On Assets (ROA) over the period 2007 - 2011. Treated is a dummy variable for having a debt relief in any year, $post \times treated$ a dummy variable for having a debt relief during this given year or a previous year. Treated_b is a dummy variable for having benefited from a government bail out in any year, and $post_\text{b} \times treated_\text{b}$ a dummy variable for having a debt relief during this given year or a previous year. All other controls are the same as in Table 6, namely: previous accounting exercise total assets, Tier 1 capital ratio, client deposits over total funding, impaired loans over assets, risk weigthed assets over total assets, and yearly change in total assets, as well as a dummy variable for being publicly listed. Standard errors are clustered at the issuer level. T-statistics are displayed below their coefficient of interest.

Table A4: Country Group Trends

	Hybrid User (A)	Non Call User (B)	Tender User (C)
Post x Treated	0.850**	0.986**	0.579*
	(2.57)	(2.23)	(1.73)
Non-Call	-0.638**	-0.817**	-0.556**
	(-2.00)	(-2.40)	(-2.29)
Seasonal Equity Offering	-0.263	-0.2767	-0.0883
	(-1.28)	(-0.80)	(-0.64)
Change in Assets	1.957***	1.819**	0.546*
	(3.02)	(2.01)	(1.92)
Treated	0.065	0.228	-0.113
	(0.41)	(1.07)	(-0.60)
Scandinavia*Year FE	Yes	Yes	Yes
Periphery*Year FE	Yes	Yes	Yes
Rest of Europe	Control	Control	Control
Year FE	Yes	Yes	Yes
Other Controls	Yes	Yes	Yes
Cluster	Issuer	Issuer	Issuer
R^2	0.1688	0.1599	0.4409
N	684	318	126

Note: This table displays the coefficients of OLS regressions with the same specification as Table 6. Regression also includes dummies variables for Eurozone periphery countries (Portugal, Italy, Ireland, Greece and Spain), as well as Scandinavian countries, interacted with year fixed effects. Standard errors are clustered at the issuer level. T-statistics are displayed below their coefficient of interest.