Contingent Capital Trigger Effects: Evidence from Liability Management Exercises

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Abstract

This paper studies liability management exercises (LME) by banks, which bear comparable regulatory capital effects than contingent capital triggers. LMEs are concentrated in situation of low capitalization, both in the cross-section and the time-series, and are frequently associated with equity issuances. These exercises prove effective at improving bank capitalization levels. The market reaction to LMEs is positive and accrues for the most part to debt holders. These findings strengthen the case for innovative liabilities securities to be a tool to improve bank resilience.

Keywords: Contingent Capital, Financial Distress, Regulatory Capital, Financial Institutions
JEL codes: G21, G28, G01, G14

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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 so far amount to more than USD500bn since 2009, and their rhythm has been increasing. Among these Basel III-compliant instruments, which trigger if a regulatory capital ratio drops below a given threshold, the most popular contract design consists of *Principal Write-Down* bonds and *Contingent Convertibles*, known as CoCos. Principal Write-Down bonds offer a reduction of the principal in case of a trigger event, and represent 55% of the current issuances (Avdjiev et al., 2017). The remaining issuances consist of CoCos, which convert into common equity when triggered.[1]

Whether contingent capital securities offer effective loss-absorption and facilitate deleveraging in times of distress remains however a vividly debated question among practitioners, academics and regulators (Pazarbasioglu et al., 2011; Delivorias, 2016). In theory, contingent capital instruments, first proposed by Flannery (2005), and supported by an increasing body of literature (Brunnermeier et al., 2009; Kashyap et al., 2008; French et al., 2010), provide banks with a form of insurance on their regulatory capital, thereby improving their loss-absorption capacity. This ex ante insurance mechanism could reduce the documented frictions associated with raising equity, which are particularly acute in times of distress (Bolton and Samama, 2012). Effective bank deleveraging through bail-in securities which are issued during boom periods is an appealing alternative to government bail-out, since the capital is provided when it is abundant, and the cost of financial distress is born by investors and not taxpayers.

The use of these instruments has however raised some important concerns.[2] A first

[1] By contrast to the rest of the world, US banks are not currently issuing this type of securities, as they do not obtain regulatory capital treatment under US regulation. However, the single-point-of-entry resolution mechanism under Title II of the Dodd-Frank Act would rely on bail-in securities, which share the same economic rationale.

[2] The set of concerns applicable to write-down bonds is narrower than for Cocos. First, because the triggers of principal write-down bonds are not value dilutive to existing shareholders, they do not create a risk of "death spiral" (Sundaresan and Wang, 2015). 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.

concern is whether these instruments are actually effective at improving banks' resilience in times of stress and effectively mitigate the regulatory capital constraint that banks with low capitalization face. Such instruments might indeed create disincentives for shareholder to raise equity in times of stress as their triggers might transfer value to shareholders. Alternatively, a bank might be reluctant to let such instruments trigger as it leads to a form of violation of the absolute priority rule: contingent capital investors bear losses before equity-holders do. Relatedly, a trigger could send a negative signal on bank balance sheet quality, which might exacerbate banks' difficulties instead of helping to solve them.[3]

I investigate empirically the effects of contingent capital triggers, and identify the main economic mechanism behind them, by studying the so-called liability management exercises (LMEs) by European banks 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 transactions allowed the banks to book consequent capital gains on their liabilities as core tier-one, therefore propping up their most scrutinized regulatory capital ratio. For instance, Banco Santander, the Spanish bank, increased its core tier-one capital by more than 4 billion euros through these actions. For the purpose of my analysis, I hand-collect a comprehensive database of liability management exercises by European banks covering the period 2008-2016. I use the banks' websites and broker coverage reports to obtain detailed data on LMEs and match this data with issuer financials, security issuances, as well as credit default swaps (CDS) and share prices.

While data on the trigger of new-generation contingent capital instruments will not be available to researchers until the next financial crisis, there are four main reasons why liability management exercises represent an adequate laboratory for investigating these

[3]A different type of criticism has focused on the tax treatment of these instruments, which benefit from tax deductibility of their interests, as debt does. The argument against contingent capital is that they would constitute a form of tax arbitrage. However, contingent capital instrument issuances do not appear to be correlated with corporate tax at the country level, with for instance a high volume of issuances in Singapore where corporate tax is low.

triggers. First, the impact of LMEs on banks' regulatory capital ratios is similar to a contingent capital trigger: the capital gain on the exercise is booked as an increase in core tier-one, the highest quality of regulatory capital, and the amount of subordinated debt is reduced.[4] The majority of these tenders are funded with cash and correspond to the trigger of a principal write-down bond, while some are implemented through an exchange in stocks, which is comparable to triggering CoCos. Second, because banks use the threat of never calling these perpetual securities and have the discretion not to pay coupons, investors are strongly encouraged to accept these offers to avoid being kept in an illiquid and highly subordinated position.[5] Their situation is therefore comparable to that of contingent capital investors facing a compulsory trigger. Third, 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. Fourth, these exercises are conducted at a large scale and by more than 50 different banks, which allows the first and only feasible econometric analysis of this issue before the next crisis.[6]

The paper provides a set of novel empirical findings. First, I show that non-bankrupt European banks are comfortable with imposing significant losses on subordinated debt holders, thereby obtaining additional core tier-one capital but violating the absolute priority rule. Under issuers' threat of extending the maturity of the instruments, investors have tendered more than EUR 110bn of hybrid bonds, which has allowed European banks to increase their core tier-one capital by more than EUR 30bn.[7] This episode represents a counter-example to the widespread view that banks are reluctant to impose losses on

[4]See Figure 1 for more details on the regulatory and accounting balance sheet effects of LMEs and contingent capital triggers.

[5]Secondary market liquidity is low for these instruments even prior to LMEs.

[6]Banco Popular Basel-III contingent capital securities were wiped-out in June 2017. The first and only loss on the new generation of contingent capital for investors, this event does not even allow a case study to judge the effectiveness of these instruments, as Banco Popular failed due to sudden losses that were significantly larger than its total amount of capital (common and contingent), and was consequently acquired by Santander for one euro. The contingent capital securities therefore did not get triggered as shareholders and all types of creditors got wiped out.

[7]This amount is economically large when compared to the amount of equity issuances for the same period of EUR130bn.

debt holders, and therefore suggests that banks will not try to avoid contingent capital triggers. In addition, LMEs are implemented by banks with singularly low levels of regulatory capital, both in the cross-section and the time-series, which supports the regulatory capital channel as the main mechanism at play. Banks implementing LMEs are also more likely to raise equity, which suggests a complementarity between bail-in securities and equity issuances. By instrumenting LMEs size through a regulatory limit on hybrid bond issue prior to the crisis, I document a causal improvement in core tier-one ratio, which is proportional to the size of LMEs. These improvements are larger than the core tier-one directly created by the LMEs, which is consistent with facilitating other recapitalization actions.

Turning to the market reactions, LMEs are, for the most part, received positively by debt holders, with a more pronounced gain for subordinated creditors. Stock reaction is more mixed but negative reactions appear driven by the subset of banks that received government bail-out. Market reaction is therefore consistent with liability management exercises allowing banks to relax their regulatory capital constraint in times of stress, thereby creating value that mainly accrues to creditors.[8] The data are not consistent with a negative signal from LMEs, and suggests that potentially associated costs are low.

This paper contributes to several fields of research. First, this work broadly relates to the questions of bank capital structure (Admati, Demarzo, Hellwig, and Pfleiderer, 2013; DeAngelo and Stulz, 2015), bank debt overhang (Admati, DeMarzo, Hellwig, and Pfleiderer, 2012; Philippon and Schnabl, 2013), behavior of distressed financial institutions (Acharya et al., 2013), and bank liabilities restructuring (Colliard and Gromb, Colliard and Gromb). More specifically, this paper brings empirical supports to the development of contingent capital instruments as an effective complement to raising common equity

[8]This regulatory capital constraint is arguably driven by both the regulator and market participants. The latter indeed scrutinize bank regulatory capital ratios, potentially affecting bank decisions before the regulatory constraint becomes binding. Under Basel II, the minimum Tier 1 ratio was 4% of risk-weighted assets, however during the crisis market participants became vocal about banks needing more capital than this level, and increasingly turned their attention to core tier-one ratio, which had no regulatory lower bound. The introduction of stress tests by the EBA has increased the focus on Core Tier 1.

requirements for improving bank resilience. The theoretical literature on contingent capital provides both arguments in favor of using these securities (Pennacchi, Vermaelen, and Wolff, 2014; Martynova and Perotti, 2018; Zeng, 2012; Flannery, 2016; Duffie, 2010) and against it (Sundaresan and Wang, 2015; Chan and Van Wijnbergen, Chan and Van Wijnbergen). On the other hand, empirical work remains scarce. The closest work to my study is Avdjiev et al. (2017), who explore the effects of the *issuances* of contingent capital instruments on bank funding cost, and find evidence consistent with a reduction in banks' credit risk. Another recent empirical work from Berg and Kaserer (2015) explores CoCos secondary trading prices to investigate their impact on risk-taking.

Second, 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 innovative liability instruments may be driven by adverse incentives (Pérignon and Vallée, 2017), this study illustrates how innovative instruments on the liabilities side of the balance sheet may help address frictions, e.g. for banks to access capital in times of stresss (Bolton and Samama, 2012), potentially preventing or at least mitigating future financial crises (Haliassos, 2013).

Last, this study expands the knowledge of bank subordinated debt and preferred securities (Krishnan and Laux, 2005; Benston, Irvine, Rosenfeld, and Sinkey, 2003; Boyson, Fahlenbrach, and Stulz, 2016).

This paper is organized as follows: Section 2 provides background on liability management exercises and develops the hypotheses. Section 3 presents the dataset built for the empirical analysis. Section 4 documents the extent of LMEs, which banks implement them, and their effects on bank balance sheets. Section 5 studies the market reaction to liability management exercises from both debt and equity holders. Section 6 considers alternative mechanisms than a regulatory capital channel, and the potential costs associated with LMEs. Section 7 concludes.

2 Background on Liability Management Exercises

2.1 Call Strategy on Hybrid Bonds

Liability management exercises were made possible by the development of hybrid bonds for banks.[9] Hybrid bonds exhibit a contingent dimension as the issuer decides whether to call or not the security at first call date, in the latter case postponing repayment for a long to infinite amount of time. The issuer also has the right to defer their coupon without creating an event of default.[10] Appendix A provides an example of hybrid bond terms. The design of hybrid bonds allows them to gain regulatory treatment as capital under Basel II: they account for either Tier 1 or Tier 2 capital (but not Core Tier 1), depending on their legal maturity and conditions on coupon payments. Prior to the crisis, European banks issued large amounts of these bonds. In 2008, European Hybrid Bonds amounted to more than EUR 700bn, or 40% of European banks' regulatory capital. Banks had historically called the bonds at par at the first call date. When the crisis hit and refinancing costs surged for financial institutions, banks however reconsidered their call strategy.

At the call date, the bank faces three alternatives: to call at par, not to call, and not to call and launch a tender offer (at a discount). These three decisions have different economic and regulatory implications for the bank.

Call

The issuer can exercise the call option embedded in the hybrid bond, and call it at par. Calling therefore makes economic sense for the bank if the value of the bond is above par, which would be the case if the bank is well capitalized, as the coupon typically steps up after the first call date. Exercising the call has been the default decision historically.

Non-Call

At the call date, the issuer can decide not to exercise its option, which creates economic

[9] For more details on the hybrid bond market, see the online appendix.

[10] For non cumulative securities, issuer has even the right not to pay the coupons without creating any default, also such decisions have been extremely rare and typically imposed by the regulator.

value for poorly-capitalized issuers when compared to calling. When not called, the bond is worth less than par because the state of nature is bad (i.e. the bank is poorly capitalized), and because the option holder decides not to exercise it.[11]

A non-call however leaves the amount of regulatory capital (of all tiers) unchanged.

Liability Management Exercise: Coupling non-call with a tender offer

Lastly, the issuer can choose not to call its hybrid bonds and launch a tender offer on them.[12] Such an action has the same economic value as the non-call, but also has a direct and permanent effect on Core Tier 1. Similar to the trigger of contingent capital instruments, LMEs actually deplete lower quality regulatory capital (e.g. Tier 1 or Tier 2), which then need to be replaced. Due to the economic value of the non-call, the tender offer can be realized at a significant discount, which crystallizes this economic value gain. The capital gain, i.e. the difference between the nominal amount and the tender price, feeds into the Core Tier 1 capital and thereby increases the Core Tier 1 ratio. The tender offer can take the form of a cash offer, or an exchange offer against a new security. The exchange offer avoids any liquidity drain on the bank balance sheet, but might be less attractive to the investors.

Figure 1 summarizes the accounting and regulatory balance sheet effects of cash LMEs, comparing them to the ones of principal write-down triggers. The effects for tender LMEs and CoCos are described in figure A1 of the appendix.

[INSERT FIGURE 1]

2.2 The Regulatory Channel: Predictions

Banks need sufficient regulatory capital to be able to conduct risky lending, investing, and to raise financing at attractive terms. Banks with low regulatory capital therefore face a

[11] A more intuitive way to think about the non-call decision is to consider a fixed maturity bond that can be extended into a perpetuity at the discretion of the issuer. By construction of an option, the issuer only extends the bond when it is in its favor, and therefore against the investor interests.

[12] While these two actions can be simultaneous, there are also instances where the bank first announces or reveal its non-call policy, and launches a LME later.

"regulatory capital constraint", which has been shown to affect their activities (Jiménez et al., 2017; Fraisse et al., 2019). The regulator can indeed force financial institutions to forego positive NPV projects until their regulatory capital levels improve. Before this explicit constraint binds, banks are eager to keep a buffer as market participants scrutinize capital ratios to assess bank resilience, and low regulatory capital can thereby restrict their actions on both sides of their balance sheet. This effect is most likely compounded by the introduction of stress tests. The main hypothesis I test in this study is thus whether LMEs can effectively relax this regulatory constraint, which speaks both to its existence and the type of liabilities that can mitigate it.

As described in the previous subsection, a LME leads to an improvement in the Core Tier 1 ratio of the bank that implements it. LMEs might however have alternative effects that are discussed in Section 6. If LMEs do relax the regulatory constraint, the following testable empirical predictions follow:

1. LMEs should be frequent following the financial crisis as it depleted bank regulatory capital.

2. LMEs should be concentrated among banks with low regulatory capital ratios, particularly the Core Tier 1 ratio.

3. Non-calls without an associated LME should be infrequent, as they do not have a regulatory benefit in addition to the economic value of the non-call.

4. LMEs should be associated with other actions that aim at improving regulatory capital such as equity issuances.

5. LMEs (and associated actions) should translate into a significant improvement in the Core Tier 1 ratio of the banks implementing them.

Turning to the value effects of LMEs:

6. LMEs should have a positive effect on bank value, with the increase in value accruing first to debt holders, and then to equity holders.[13]

[13]Similar to debt overhang, the value created by the relaxation of the regulatory constraint will accrue first to creditors, and then to equity holders. The senior creditors are however not the class of creditors benefiting the most, as they have a higher expected recovery rate which makes them less sensitive to a

7. These value effects should not be observed for non-call only, or at least the magnitude should be lower as only the economic value effect would play a role / there is no relaxation of the regulatory constraint.

3 Data

To test the empirical predictions, I hand collect data on LMEs by European banks, which I complement with a comprehensive dataset that covers security issuances, financial and regulatory statements, and CDS and share prices.

I first hand collect press releases from issuers and reports from bank research desks detailing LMEs. 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 capital gain. This hand collected data covers the period 2008-2016. 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. While 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.[14] A recent paper by Lubberink and Renders (2016), which uses data collected by investment bank DCM desks, allows for an additional cross-check of the quality of the hand-collection exercise.

I then compile a dataset of the whole universe of hybrid issuances in Europe over the period 1998 to 2012.[15] 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.

change in default probability than junior creditors.

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

[15]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.

As required for conducting an event study I merge manually by issuer 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 and from the 2011 and 2014 EBA stress test data through additional manual mergers by name of holding company. I also convert variables of interest of Bankscope into euros.[16]

4 LME and Need for Regulatory Capital

4.1 Extent of the Phenomenon

I first document the extent of liability management exercises by European banks, which led to more than EUR110bn of hybrid bond being tendered, and more than EUR30bn of core tier-one creation for European banks following the financial crisis. This aggregate fact is consistent with the first prediction of section 2. Figure 2 displays the amount tendered and associated Core Tier 1 creation for LMEs over the years, breaking down between LMEs funded through cash tenders, and the ones funded through an exchange offer. The frequency and the magnitudes of these transactions illustrate how banks that are not in default are not reluctant to crystallize large losses from their subordinated debt investors, which is key for the development of bail-in securities. The figure illustrates how the majority of LMEs are implemented in the years following the financial crisis, with a ramping up until 2012, as hybrid bonds are losing their regulatory capital treatment, and banks are under pressure from the regulator to increase their core tier-one to pass stress tests. While 2012 was the year where the amount of hybrid bonds tendered was the largest, 2011 saw the largest core tier-one creation, as hybrid bonds were tendered at a larger discount that year, resulting in larger capital gains. Exchange offers, initially the predominant way of implementing tenders, become less popular as time passes by, while

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

cash tenders gain traction.

[INSERT FIGURE 2]

Table 1 presents summary statistics on the main characteristics of Liability Management Exercises.

The table shows that these exercises have been widespread, with 58 different issuers implementing these types of actions, and that they have been massive: I identify a lower bound of EUR 113bn of hybrid bonds being tendered, and more than EUR 30 billion of core tier-one capital being created through these exercises. For instance, Banco Santander managed to gain more than EUR 4bn of core tier-one capital from such actions. LMEs through cash tenders appear to be more frequent than LMEs through exchange offers.[17] Tier-one hybrid bonds are tendered with the largest discount, 33% on average, compared to 20% for tier-two instruments, as would be expected from their super-subordinated position in the capital structure. The existence of LMEs on tier-one instruments suggest that banks are prioritizing increasing their core tier-one ratio, even at the expense of their tier-one ratio, which underlines the importance of the core tier-one ratio in terms of regulatory capital constraint.

The second column evidences how the bulk of LMEs are implemented by banks from the European Banking Authority (EBA) stress test list. EBA banks represent more than two thirds of the core tier-one creation from these actions. EBA banks are under heightened scrutiny from the regulator to maintain a resilient balance sheet, due to their systemic nature, which likely encouraged them to implement LMEs.

[INSERT TABLE 1]

4.2 LMEs and Bank Capitalization

I then test the second prediction of section 2: whether LMEs are associated with low level of regulatory capital, and find it to be the case both in the cross-section and the

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

time-series.

Table 2 presents the results of logit regressions on implementing LMEs. Columns 1 to 3 present cross-sectional regressions, where the left hand side variable is an indicator variable equal to one if the issuer has implemented an LME during the period 2009-2015. The analysis is conducted on the cross-section of banks, with financial data as of end 2009.[18] Column 1 conducts this logit regression on all European banks that have outstanding hybrid bonds, and are therefore in a position to conduct an LME during the period, and whose financial data is available in Bankscope. Column 2 presents the same regression when restricting the sample to the list of banks considered systemic by the EBA, to zoom-in on the sub-sample of banks the most relevant for our analysis. Banks on the EBA systemic list are under particular scrutiny in terms of regulatory capital ratios. Column 3 reproduces the specification of column 2, substituting core tier-one ratio, as measured during the stress test of April 2011, to tier one ratio. Core tier-one is not available in Bankscope, while it is included in the EBA stress test data.

These regressions establish that banks with low regulatory capital ratios during the financial crisis, especially Core Tier 1 ratio, are significantly more likely to conduct LMEs. Turning to the magnitudes, average marginal effects for the regression of column 3 indicates that a reduction of 1 percentage point of Core Tier 1 ratio translates into an increase of 5 percentage point of the probability of a bank conducting an LME, or 13% of the average probability for the EBA sample. Additional characteristics predictive of LMEs are size, being a listed bank, and having available cash on the balance sheet. The first two characteristics are likely to proxy for regulator and investor attention to capital levels, while the latter can be rationalized by the need for some liquidity to conduct a cash LME.

In column 4, I explore whether certain issuers are more likely to conduct an LME funded through an exchange offer, which do not require any liquidity. I observe that banks with the lowest level of capital among LME users are more likely to choose this form of

[18]Results are similar when using financial data from 2008.

LME, while available cash has no predictive power. A large share of these banks received a government bailout, and the regulator forced them to choose this type of LMEs so as not to give the impression of distributing liquidity obtained from the bail-out to investors.

I then turn to a panel analysis, by running c-logit regressions on doing an LME in a given year, using financial characteristics as per the previous annual closing as explanatory variables. Column 5 and 6 present coefficients from these regressions using two samples: hybrid issuers, and EBA banks. This analysis, which controls by construction for bank fixed effects, shows that a drop in regulatory capital, as well as a reduction in assets, is associated with a higher probability of implementing an LME.

Altogether, these results are supportive of LMEs being a widespread method for banks under stress to improve their core tier-one ratio. This motive is also brought forward in the press releases for these transactions. LMEs may also facilitate other components of a broader recapitalization program.

[INSERT TABLE 2]

4.3 Complementarity With Equity Issuances

I therefore test whether LMEs are associated with the most direct action aiming at improving regulatory capital position: equity issuance. Such association would provide some colors on whether bail-in securities can mitigate bank debt overhang, or other frictions to raising equity capital in times of stress. I therefore run logit regressions on implementing an equity issue between the 2011 and 2014 EBA stress tests, and use an indicator variable for LMEs as an explanatory variable. I indeed find that banks that implement an LME are more likely to implement an equity issue as well.

Column 1 in Table 3 conducts the analysis for all EBA banks, while column 2 excludes bail-out banks, where the association could be mechanical if imposed by the regulator. In both columns, LMEs appear to be associated with a significantly higher likelihood of implementing an equity issue. LMEs therefore appear to be a complement, and not a

substitute, for equity issuances.

[INSERT TABLE 3]

4.4 Impact on Regulatory Capital

I then test whether the core tier-one creation from LMEs translates into an actual increase in core tier-one ratio for the banks. For this purpose, I run the following regression on the sample of EBA banks that were part of both 2011 and 2014 stress test:

$$ChangeCoreTierOne_i = \alpha + \beta \times CoreTierOneCreation_i + Controls_i + \epsilon_i$$

where $ChangeCoreTierOne_i$ is the change in core tier-one Ratio, in percentage points of risk-weighted assets, between the 2011 stress test and the 2014 stress test. $CoreTierOneCreation_i$ is the creation of core tier-one through LMEs implemented by bank i during that period, also expressed in percentage points of risk-weighted assets. Regressions coefficients from the regression are displayed in column 1 of Table 4, with controls for bank size and listed status. Column 2 includes additional controls: Tier One Ratio, Cash over Assets, and Deposit over Liabilities. Core tier-one creation from LMEs appears to be associated with an improved capitalization level, and is therefore not offset by potential counteracting effects or actions. The improvement on core tier-one capital is actually larger than the LME core tier-one creation, as the regression coefficients on $CoreTierOneCreation_i$ are larger than one, which suggests a complementarity between LMEs and other recapitalization channels. In columns 3 and 4, I restrict the sample to LME users to identify at the intensive margin. The point estimate from this restricted sample appears more precise, and consistent in magnitude.

[INSERT TABLE 4]

A natural concern over the previous analysis is a potential source of endogeneity on the size of LMEs: banks with lower regulatory capital would implement larger LMEs, as

well as other ways of deleveraging, without the association being causal.[19]

To gain causal identification, I therefore instrument the size of core tier-one creation through LMEs with the regulatory limit on hybrid capital imposed to banks under Basel II at the country level. This limit varies by country as the principles of Basel II are translated into national laws. Country limits on hybrid bonds, expressed in percentage points of tier one capital, are provided in table A4 of the appendix. The rationale of this instrument is that banks that had lower limits on hybrid bonds issued relatively less of such instruments before the crisis compared to similar banks in countries with higher limits, and were therefore not in a position to implement as large LMEs when the crisis hit.

Column 5 exhibits the regression coefficients of the first stage of the instrumental variable analysis. The country limits appear to be a strong predictor of the relative size of the LMEs. Due to their narrow and regulatory nature, as well as their pre-existence to the financial crisis, these limits are unlikely to directly affect the change of core tier-one ratio during the period 2011-2014, which supports the absence of violation of the exclusion restriction for the instrument. Columns 6 and 7 present the instrumented version of columns 3 and 4. The coefficient on $CoreTierOneCreation_i$ is still positive and significant under this specification, which supports a causal interpretation of the relationship between LMEs and improvement in core tier-one ratio.

5 Value Effects of Liability Management Exercises

This section investigates the value effects of LMEs on CDS and stock prices. Overall, the market reaction to LMEs is consistent with prediction 6: an increase in firm value due to a relaxation of the regulatory capital constraint, which accrues mostly to bondholders.

[19]The potential concern over endogeneity only applies to the magnitude of LMEs under the specification I use, and not to the decision to implement an LME, as the sample is restricted to LME users in columns 3 and 4 for this purpose.

5.1 Methodology

For this analysis, I follow the event-study methodology of Brown and Warner (1985) and MacKinlay (1997).[20] Although a small number of liability management exercises are made in conjunction with other issuer specific news, typically for bailed-out banks, the large majority of them are announced independently from any other corporate events, as observed on issuer press releases.[21]

I use change in Credit Default Swap (CDS) spreads (both senior and subordinated) to measure debt value reaction to LMEs. CDS are more liquid than bonds, which limits measurement errors.[22] For the equity value reaction, I examine the stock prices of listed banks. Cumulative abnormal returns are the sum of abnormal returns over the considered windows: over a -1/+1 day window.[23] I calculate adjusted returns of CDS as the change in a given issuer spread minus the change in its benchmark index. This adjustment is comparable with the rating adjusted spread used in Jorion and Zhang (2007). Abnormal stock returns are calculated based on the CAPM model, using the benchmark as the market index. Stock betas are estimated prior to the LME events, over a window of 200 days starting on January 1st, 2008.[24] I first look at the raw market reaction, and then adjust for two benchmarks: a broad benchmark (iTraxx Financial for CDS and Euro Stoxx 50 for stocks) and a benchmark built with the other LME users, for maximum comparability.

5.2 CDS Spreads Reaction

Table 5 presents the average reaction of CDS spreads to LMEs. LMEs have a tightening effect on issuer CDS spreads, meaning investors perceive issuer credit quality to

[20]The identification strategy of this event study relies on the semi-strong form of market efficiency: market reaction is driven by information made public at the time of the LME announcement.

[21]Robustness checks of the event study excludes bailed-out banks for this reason.

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

[23]Results are similar with a [-2,+2] window.

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

be improved by LMEs, which is consistent with a relaxation of the regulatory capital constraint. The effect on issuer CDS spread is statistically and economically significant for both senior and subordinated CDS.[25] Depending on the specification, the senior CDS spread tightens by 2 to 5 basis points, while the subordinated CDS spread tightens by 10 to 15 basis points. The larger magnitude of subordinated CDS reaction is consistent with these securities being more information sensitive than senior CDS due to the lower recovery rate of subordinated debt, as well as less influenced by so-called too-big-to-fail government put options.[26] This result is robust to the three specifications for market reaction: raw change in CDS spread, and change adjusted by iTraxx Financial change, and by the average CDS spread change for LME users.

I then restrict the sample of the event study to EBA banks and observe comparable results, which ensures that small banks do not drive this result. I also explore whether the type of LME matter for CDS spread reaction. LMEs funded by cash appear to be associated with a somewhat more pronounced CDS spread tightening than the ones financed by an exchange tender.

To rule out that the CDS spread tightening results from a form of bailout from government being announced simultaneously, I split the sample between banks having received no bail-out and banks having received bail-out. The result appears to be robust for both sub-samples, and coefficients are more precisely estimated for non-bailout banks.

This positive reaction from debt investors is consistent with LMEs allowing a relaxation of the regulatory constraint. To strengthen this interpretation, I split the sample between banks with low tier one capital (less than 10% of risk-weighted assets) and banks with higher regulatory capital, and find that the CDS spread tightening is stronger for banks with low regulatory capital: within this subsample, senior CDS spreads tightens by 7 basis points, while subordinated CDS spreads tightens by 20 basis points.

[25]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.

[26]The subordinated CDS spread reaction is distinct from any price reaction from the hybrid bond subject to the LMEs, which are mechanically driven by the tender price.

[INSERT TABLE 5]

5.3 Stock Price Reaction

Table 6 displays the event study results for stock prices reaction. Overall, the stock price reaction to LMEs appears to be moderately negative, with a cumulative abnormal return around 1%. The magnitude is comparable when restricting the sample to EBA banks.

To dig further into this negative stock reaction, I cut the sample according to bank bail-outs, and observe that the negative reaction is concentrated on the bailed-out banks. This is in contrast to the debt reaction, where bailed-out banks CDS are not reacting differentially from non-bailed-out banks, and suggests that the negative stock price reaction could result from announcements related to the bail-outs, and not the LMEs per se. I also look separately at LMEs implemented through cash tenders, and the ones implemented through exchange offers. This cut of the data suggests that the negative stock reaction is more pronounced in the exchange operations. This is again in contrast to the debt reaction, where both types of transaction are generating a similar tightening in the CDS spread. This negative reaction for exchange LME is consistent with the potentially value-dilutive nature of an exchange of hybrid bond into equity, but should be interpreted with caution due to the low power of the test.

The negative stock price reaction appears to be driven by subsets of banks: bailed-out banks, and banks that implement exchange offers, which largely overlaps.[27] LMEs are largely neutral in terms of equity value for banks outside of these subgroups.

[INSERT TABLE 6]

Overall, market reactions are therefore consistent with LMEs allowing to relax a binding regulatory constraint, with debtors mostly benefiting from it. A parallel can be drawn with debt overhang, where the benefit of recapitalization initially accrues to creditors.

[27] Bailed-out banks typically announced LMEs as part of a broader set of bail-out measures.

6 Alternative Explanations

In this section, I consider alternative mechanisms for the empirical findings previously discussed, as well as potential costs associated with LMEs.

6.1 Economic Value of Non-Call / Reduction in Roll-Over Risk

As described in section 2, LMEs are implemented in conjunction with a non-call strategy. One potential interpretation of the tightening of CDS observed at the time of the LME announcement would be that it comes from the economic value of the non-call and/or the reduction in roll-over risk associated with non-calls, and not from the relaxation of the regulatory capital constraint that LMEs provide. To rule out this alternative mechanism, I therefore run a similar event-study focusing on non-call announcements that are made prior to any LME announcement by the same bank.

Results are displayed in table 7. Non-calls that are not associated with an LME announcement do not generate significant reaction from CDS spreads nor stock prices. While the mild tightening of senior CDS is consistent with a moderate economic value gain, these benefits appear to be an order of magnitude too small to be driving the market reaction to LMEs documented previously.

[INSERT TABLE 7]

A related alternative explanation of the result would be that LMEs are conducted at prices significantly below the value of the hybrid bonds, and therefore that LMEs transfer value from hybrid debt holders to the banks. Implementing tenders below market prices might be possible due to the lack of liquidity of these instruments, especially as they get extended into perpetuities. This hypothesis is however inconsistent with the fact that LMEs are on average implemented at a premium, as documented by Lubberink and Renders (2016). Their finding suggests that banks may share some of the value they obtain from the regulatory capital relaxation with existing hybrid debt holders. This

alternative explanation is also hard to reconcile with the cross-sectional result that the value effects are stronger for banks with low capitalization. These banks should indeed have lower bargaining power towards investors, not more.

6.2 Signaling

A key concern over contingent capital instruments is that their trigger would send a negative signal to the markets over the quality of the bank balance sheet, thereby making it harder for the bank to raise additional capital (Pazarbasioglu et al., 2011). Even in the absence of new information, for instance if the trigger results from a publicly known threshold, a trigger might make the low capitalization level of the bank more salient to market players.

Following the same token, LMEs may send a signal to market participants about the unobserved quality of the bank balance sheet, or signal that equity issuances are challenging for the bank. They may also have a saliency effect. The decision of not calling at par might also be interpreted as a negative signal.[28]

The previously described findings are however inconsistent with a negative signal from LMEs, which would lead to a widening of CDS spread, not a tightening, and a negative excess return on stocks. In the cross-section, the fact that the tightening effect on CDS spreads is more pronounced for banks with low capitalization is further evidence against a negative signal from these exercises.

On the other hand, the value effects can be consistent with a positive signaling value of LMEs, which is often the motivation behind security repurchases. For instance, if banks are using these transactions to signal the availability of cash on their balance sheet or confidence in raising new regulatory capital instruments in the future, or if it signals sophistication on the part of the management team. While a positive signal for LMEs can further help mitigating frictions to recapitalization, it may question the external

[28]Discussion with practitioners suggest that certain banks were worried about such negative signal when deciding on their call strategy.

validity of the results for contingent capital triggers as the latter are less discretionary in nature. While this positive signal effect cannot be tightly ruled out empirically, the cross-section of reactions suggests that if such mechanism is at play it is of limited magnitude. Indeed the reactions to cash tenders, though larger, are of the same order of magnitude as the reactions to exchange offers, whereas the previously suggested mechanisms can only happen with cash tenders.

6.3 Associated Costs

For completeness, I also study the potential costs of LMEs, which could bias downward the positive value effects: a cash drain for cash tenders, and a stigma affecting future security issuances, which would raise the cost of capital going onward.[29] The latter concern extends to contingent capital instruments, as the violation of the absolute priority rule they represent might alienate debt investors, who therefore might be reluctant to lend again to the issuer. It also raises the question of investor education when marketing non-standard securities.

Cash Drain

I first study whether cash LMEs consume a significant fraction of bank liquid assets. I compare the cash used by cash LMEs and the amount of cash and its equivalents banks have on their balance sheet before implementing an LME. I observe that for the majority of cash LME users, the cash used by the LME is less than 10% of the cash the bank holds on its balance sheet, suggesting that any value effect of a liquidity drain would be quantitatively small (see figure A2 in the appendix). Moreover, this potential effect can only bias negatively value effects, and therefore makes the empirical setup conservative to measure the positive effect of a relaxation of the regulatory capital constraint. Lastly, LMEs implemented through exchange offers provide with a counterfactual that has no impact on cash.

[29]This argument was brought forward by some investment banks acting as advisors to issuers to discourage them from implementing LMEs, or to encourage them to call hybrid bonds at par.

Subsequent Debt Issuances

I then test whether LMEs impact the pricing of subsequent debt issuances by the same bank. I regress yield to maturity at issuance on an indicator variable for the issuance being the first issuance of a bank since it performed an LME, controlling for issuance characteristics, such as rating-month fixed effects, security type, maturity, and bank financials. The sample of the analysis covers bond issuances by European banks having issued Basel-II hybrid instruments prior to the crisis.

Results are displayed in table A5 in the appendix, and show a positive coefficient on the indicator variable for being a bond issuance immediately following an LME. This result suggests that it can be more expensive to issue a bond for banks that have recently implemented an LME than for banks that have not, consistent with a lower demand from investors for these bonds. A possible interpretation of this result is that some investors "punish" the banks that have recently imposed losses on hybrid bond holders, thereby violating the absolute priority rule -or at least their expectations- when conducting LMEs. It underlines the importance of educating investors to the risk resulting from hybrid capital instruments such as contingent capital, which bear many attributes of debt but may incur losses before equity does. The short-lived aspect of such an effect should however mitigate concerns over contingent capital trigger materially affecting investor behaviors in the future.[30]

7 Conclusion

This paper explores the occurrence of liability management exercises (LMEs) and their effects as a laboratory to gain knowledge into the effects of triggering contingent capital instruments.

I document that financial institutions with low capitalization massively implemented liability management exercises following the financial crisis, thereby creating large amounts

[30]In untabulated regressions, I find no significant impact when looking at ulterior bond issuances.

of core tier-one capital. Liability management exercises are associated with improved capitalization. An instrument variable analysis allows to establish the causality of such relationship. LMEs appear to be a complement of equity issuances, which suggests that the capital creation they allow reduces the frictions associated with raising equity in times of stress. When conducting an event study on the announcements of liability management exercises, I find that CDS spreads tighten significantly. This increase in debt value is consistent with a reduction of the regulatory capital constraint at these banks. The reaction of stock prices is somewhat mixed, but neutral for LMEs implemented by banks that did not receive a government bail-out.

The lessons learnt from LMEs should be portable to contingent capital instruments in general, including the ones currently issued under the Basel III framework, as the impact on regulatory capital is comparable, both in direction and in magnitude. Although the discretionary nature of LMEs might create a wedge in the signaling value when comparing to automatic-trigger instruments, these effects appear to be quantitatively small.

My results bring some empirical substance to the discussion on the efficiency of contingent capital instruments. By limiting financial distress costs during times of stress, contingent capital instruments represent an alternative or at least a complement to higher capital requirements, which banks appear less reluctant to implement, and to government bailouts that are deeply unpopular.

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8 Figures and Tables

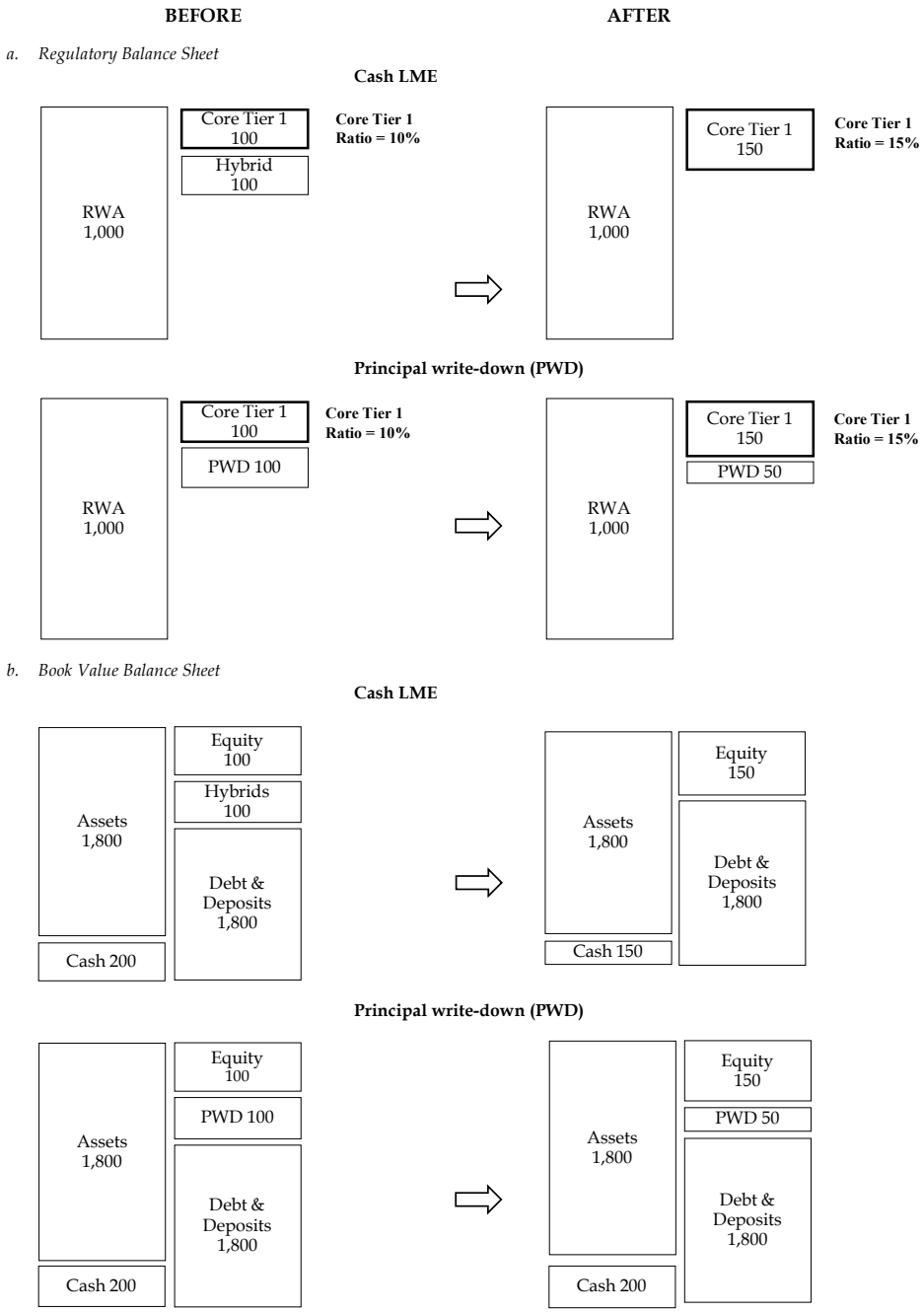

Figure 1: LME and Contingent Capital Triggers: Comparison of Balance Sheet Effects

Note: This figure compares the regulatory and accounting balance sheet effects of an LME implemented through a cash tender, with the effects of the trigger of a principal write-down bond.

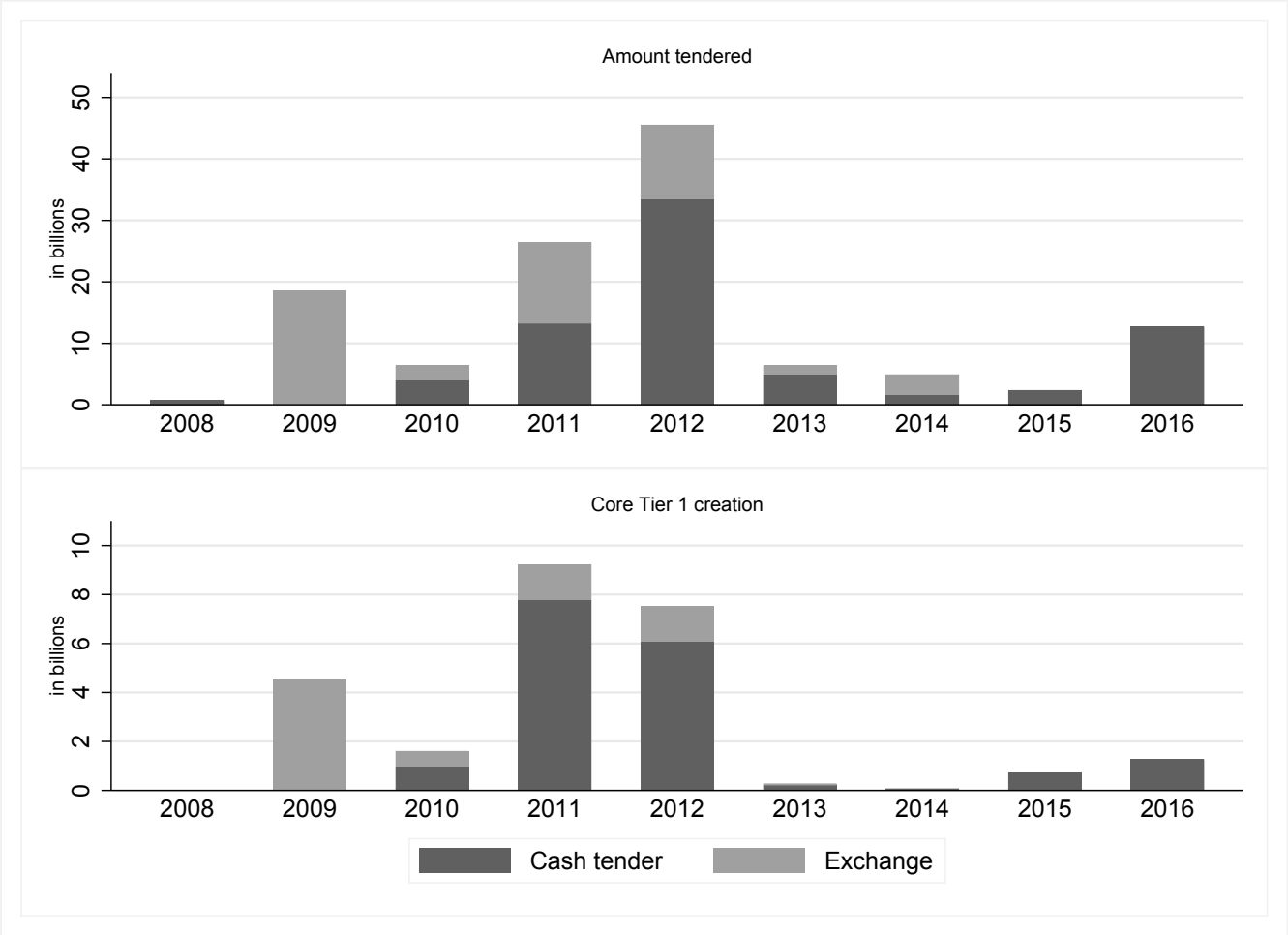

Figure 2: Liability Management Exercise Amounts

Note: This figure displays the amounts of hybrid bonds tendered through Liability Management Exercises (LMEs), and the corresponding core tier-one creation from 2008 to 2016. Both of these amounts are broken down by type of LMEs: the ones implemented through a cash tender (dark grey), and the ones implemented through an exchange offer (grey). Amount Tendered represents the total face value of the hybrid bonds that have been tendered as part of an LME. Core tier-one creation is equal to the realized capital gain of the LME, and is calculated as *(Hybrid Bond Face Value - Offer Price)*Number of Hybrid Bonds Tendered*.

Table 1: Summary Statistics on Liability Management Exercises by European Banks (2008-2016)

	All LMEs	**EBA banks**	**Cash Tender**	**Exchange Tender**
Number of Issuers	58	36	50	27
Number of LMEs	120	64	88	37
Number of Issues	771	541	556	226
Total Amount Tendered (bn EUR)	113.6	81.5	72.3	41.3
–of which Tier-One	46.1	32.5	32.3	13.8
–of which Tier-Two	62.4	46.5	35.1	27.3
–of which Senior Notes/Others	5.1	2.5	4.9	0.2
Average Offer Price (% of face value)	73.6	69.2	73.2	76.7
–of which Tier-One	66.6	62.2	64.0	69.2
–of which Tier-Two	80.6	72.4	79.4	81.7
Core Tier-One Creation (bn EUR)	30.1	21.4	20.9	9.3
–of which Tier-One	15.1	11.5	11.5	3.7
–of which Tier-Two	15.0	9.9	9.4	5.6
Average Core Tier-One Creation				
–in bn EUR	0.52	0.59	0.42	0.34
–in % of Risk-Weighted Assets	0.24%	0.20%	0.24%	0.17%

This table displays summary statistics on Liabilities Management Exercises by European Banks for the period 2008-2016. EBA banks are the banks that were subject to a stress test by the European Banking Authority in 2011. Amount Tendered represents the total face value of the hybrid bonds that have been tendered as part of an LME. Core tier-one creation is equal to (Hybrid Bond Face Value - Offer Price)*Number of Hybrid Bonds Tendered.

Table 2: Liability Management Exercise Usage

LHS: Indicator on	**Cross-section**				**Panel**	
	LME			**Exchange**	**LME**	
Sample	**Hybrid Issuers**	**EBA Banks**	**EBA Banks**	**LME Users**	**Hybrid Issuers**	**EBA Banks**
	(1)	(2)	(3)	(4)	(5)	(6)
Tier 1 Ratio	-0.200*	-0.381**		-0.397*	-0.040	-0.118**
	(-1.86)	(-2.45)		(-1.88)	(-0.79)	(-1.93)
Core Tier 1 Ratio			-0.320***			
			(-2.88)			
Cash/Assets	0.111***	0.380**	0.356**	-0.261	-0.090	-0.129
	(2.69)	(2.30)	(2.40)	(-0.84)	(-0.77)	(-0.90)
Assets (Log)	0.577***	0.171	0.154	0.522	-0.466	-1.963
	(5.47)	(0.86)	(0.88)	(1.62)	(-0.53)	(-1.62)
Deposit/Liabilities	0.009	-0.021	-0.018	-0.007	-0.056**	-0.052
	(0.67)	(-1.08)	(-1.08)	(-0.15)	(-2.40)	(-1.53)
Listed	1.412***	2.027***	1.885***	-0.455		
	(2.91)	(3.18)	(2.98)	(-0.31)		
Cluster	Country	Country	Country	Country	Bank	Bank
Observations	217	87	87	33	287	190
Pseudo R^2	0.288	0.256	0.251	0.125	0.038	0.065

Note: This table presents logit and c-logit regression coefficients on the use of LMEs in cross-sectional (columns 1 to 4) and panel data (columns 5 and 6) set-ups. In columns 1 to 3, the dependent variable is an indicator variable equal to one if the financial institution has implemented at least one LME over the period 2008-2015, and explanatory variables are financial data as of 2009 (from Bankscope), except for the core tier-one ratio which is as of 2011 and is from EBA Stress Test data. In column 4, the dependent variable is an indicator variable for the LME to be funded through an exchange offer. The dependent variable in columns 5 and 6 is an indicator variable equal to one if bank has implemented at least one LME in this given year. Standard errors are clustered at the country level for columns 1 to 4, and at the bank level for columns 5 to 6. Z-statistics are displayed below their coefficient of interest. *, **, and *** represent statistical significance at the 10%, 5%, and 1% confidence levels, respectively.

Table 3: Equity Issuance

LHS: Indicator on	Logit	
	Equity Issue	
	(1)	(2)
Bank LME	1.212**	1.403**
	(2.06)	(2.27)
Assets (Log)	0.117	0.125
	(0.40)	(0.42)
Core Tier 1 Ratio	-25.312	-32.580
	(-1.58)	(-1.61))
Cash/Assets	12.849	11.084
	(0.73)	(0.60)
Deposit/Liabilities	2.969	2.477
	(0.72)	(0.60))
Listed	2.100***	1.501*
	(2.67)	(1.70)
Cluster	Country	Country
Bailed-out Banks	-	Excluded
Observations	80	64
Pseudo R^2	0.332	0.305

Note: This table presents Logit regression coefficients where the dependent variable is an indicator variable for having implemented an equity issuance between the 2011 and 2014 EBA stress tests. Column 1 covers the whole EBA sample, while in Column 2 bailed-out banks are excluded. The explanatory variable of interest is an indicator for having implemented an LME between the two stress tests. Financial data is as per end of 2010 and comes from Bankscope. Standard errors are clustered at the country level. Z-statistics are displayed below their coefficient of interest. *, **, and *** represent statistical significance at the 10%, 5%, and 1% confidence levels, respectively.

Table 4: Liability Management Exercises and Regulatory Capital Level

	Δ CT1 Ratio (in % RWA)					Δ CT1 Ratio	
	OLS				First Stage	IV	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Core Tier 1 Creation from LME (% RWA)	1.872**	1.178**	1.827**	1.477***		3.470*	2.531*
	(2.42)	(2.21)	(2.29)	(3.91)		(1.74)	(1.84)
Hybrid Bond Country Limit					0.008***		
					(3.32)		
Assets (Log)	-0.002	-0.003	-0.007	-0.004	-0.001	-0.005	-0.005
	(-0.95)	(-0.88)	(-1.51)	(-1.18)	(-0.58)	(-1.33)	(-1.12)
Listed Bank	-0.001	-0.012	0.007	0.001	0.004	0.002	0.000
	(-0.15)	(-1.53)	(0.73)	(0.12)	(1.62)	(0.17)	(0.01)
Tier 1 Ratio		-0.006***		-0.006***	-0.001*		-0.005**
		(-6.02)		(-3.12)	(-1.74)		(-2.69)
Cash/Assets		0.116		0.082	-0.018		0.117
		(0.45)		(0.44)	(-0.32)		(0.51)
Deposit/Liabilities		-0.052*		-0.051	0.018		-0.069
		(-1.79)		(-1.37)	(1.55)		(-1.34)
Cluster	Country	Country	Country	Country	Country	Country	Country
Observations	65	60	33	31	31	33	31
R^2	0.068	0.448	0.354	0.611	0.447	0.229	0.562

Note: This table displays the coefficients of cross-sectional OLS regressions and 2SLS instrumental variable analysis. The dependent variable in Columns 1-4 and 6-7, Δ *CT1 Ratio*, is the change of core tier-one capital ratio (in % of risk-weighted assets) between the 2011 and 2014 EBA stress tests, while in Column 5 the dependent variable is the the share of core tier-one capital (in % of risk-weighted assets) created through LMEs between the 2011 and 2014 stress tests. In Columns 6-7 the core tier-one capital creation is instrumented with the country limit on hybrid bonds (see appendix for value of limits by country). Financials are as of end of 2010, and are from Bankscope. Standard errors are clustered at the country level. T-statistics are displayed below their coefficient of interest. *, **, and *** represent statistical significance at the 10%, 5%, and 1% confidence levels, respectively.

Table 5: Event Study on Liability Management Exercises: CDS Spread Reaction

		Change in CDS spread (in bps)					
		Raw Change		**vs. iTraxx**		**vs. LME Users**	
	N	Mean	T-stat	Mean	T-stat	Mean	T-stat
All Liability Management Exercises							
-Senior	73	-5.639*	-1.70	-5.426**	-1.98	-2.785	-1.08
-Subordinated	70	-15.445***	-3.30	-13.497***	-3.46	-12.071***	-3.29
LME by EBA Banks							
-Senior	57	-5.457	-1.37	-4.535	-1.43	-1.492	-0.53
-Subordinated	55	-14.767***	-2.75	-10.937**	-2.56	-10.786***	-2.78
Cash Tender							
-Senior	50	-7.911*	-1.86	-8.073**	-2.24	-3.525	-1.08
-Subordinated	47	-19.248***	-3.35	-17.084***	-3.44	-14.968***	-3.19
Exchange Tender							
-Senior	27	-1.214	-0.24	-1.427	-0.36	-1.348	-0.34
-Subordinated	27	-10.141	-1.36	-10.833*	-1.85	-12.224**	-2.14
Non-bailout banks							
-Senior	55	-6.863*	-1.77	-6.945**	-2.07	-4.867	-1.59
-Subordinated	54	-13.902**	-2.64	-12.676***	-2.77	-10.19**	-2.47
Bailout banks							
-Senior	18	-1.901	-0.29	-0.784	-0.19	3.578	0.82
-Subordinated	16	-20.654*	-1.98	-16.267**	-2.16	-18.417**	-2.31
Low Tier 1 banks							
-Senior	37	-7.227	-1.40	-7.545*	-1.76	-5.736	-1.47
-Subordinated	36	-22.637***	-2.80	-21.017***	-3.07	-17.176***	-2.88
High Tier 1 banks							
-Senior	38	-6.158	-1.45	-5.109	-1.46	-1.336	-0.40
-Subordinated	36	-11.517**	-2.34	-8.404**	-2.22	-8.679**	-2.14

Note: This table presents the average reaction of CDS spreads to LME announcements. Changes in CDS spreads are computed over a [-1d,+1d] window, and are presented non adjusted ("Raw Change"), adjusted by the iTraxx Financial index ("vs. iTraxx") over the same window, and adjusted by the average change of CDS spreads of LME users. Bailout banks are banks having received a government bail-out during the sample period (list in the appendix). Low tier 1 banks are banks with a tier 1 ratio below 10%. *, **, and *** represent statistical significance at the 10%, 5%, and 1% confidence levels, respectively.

Table 6: Event Study on Liability Management Exercises: Stock Price Reaction

		Cumulative Return : -1d / +1d (in %)					
		Raw Change		**vs. Stoxx 50**		**vs. LME Users**	
	N	Mean	T-stat	Mean	T-stat	Mean	T-stat
All Liability Management Exercises	80	-0.870	-1.15	-1.061**	-2.08	-0.888	-1.61
EBA Banks	61	-1.031	-1.02	-1.302**	-2.18	-1.161*	-1.86
Cash Tender	55	-0.652	-0.70	-0.822	-1.30	-0.814	-1.21
Exchange Tender	29	-1.403	-1.18	-1.587*	-1.97	-1.181	-1.28
Non-bailout banks	61	-0.483	-0.55	-0.520	-0.94	-0.606	-1.01
Bailout banks	19	-2.110	-1.38	-2.801**	-2.43	-1.791	-1.37
Low Tier 1 banks	35	-1.459	-1.22	-1.518*	-1.80	-1.272	-1.42
High Tier 1 banks	47	-0.520	-0.55	-0.890	-1.43	-0.713	-1.06

Note: This table presents the average stock price reaction to LME announcements. Stock price reactions are computed over a [-1,+1] window. Raw change is the non-adjusted stock price change over this window. Stock abnormal returns are calculated based on the CAPM model, using Eurostoxx 50 as the market index, and using the average stock price change of LME users. Stock betas to both these benchmarks are estimated with a 250d window before the LME announcement. Bailout banks are banks having received a government bail-out during the sample period (list in the appendix). Low tier 1 banks are banks with a tier 1 ratio below 10%. *, **, and *** represent statistical significance at the 10%, 5%, and 1% confidence levels, respectively.

Table 7: Non-Calls Prior to / Without LMEs: CDS Spread and Stock Reaction

		Change in CDS spread (in bps)					
		Raw Change		**vs iTraxx**		**vs. LME Users**	
	N	Mean	T-stat	Mean	T-stat	Mean	T-stat
-Senior CDS	44	-4.105	-1.57	-1.025	-0.37	-1.665	-0.63
-Subordinated CDS	27	-0.387	-0.12	3.410	1.33	3.841	1.53

		Cumulative Return : -1d / +1d					
		Raw Change		**vs. Stoxx 50**		**vs. LME Users**	
	N	Mean	T-stat	Mean	T-stat	Mean	T-stat
Stock	27	-0.323	-0.36	-1.003	-1.22	-2.002	-0.93

Note: This table presents the average reaction of CDS spreads (Panel A) and stock price (Panel B) to non call announcements. Changes in CDS spreads are computed over a [-1d,+1d] window, and are presented non adjusted ("Raw Change"), adjusted by the iTraxx Financial index ("vs. iTraxx") over the same window, and adjusted by the average change of CDS spreads of LME users. CDS with no price fluctuation over the window have been excluded. Stock price reactions are computed over a [-1d,+1d] window. Raw change is the non-adjusted stock price change over this window. Stock abnormal returns are calculated based on the CAPM model, using Eurostoxx 50 as the market index, and using the average stock price change of LME users. Stock betas to both these benchmarks are estimated with a 250d window before the non call announcement. *, **, and *** represent statistical significance at the 10%, 5%, and 1% confidence levels, respectively.