

STAFF MEMO

Contingent Convertible Bonds (Cocos) Issued by European Banks

NR. 19 | 2014

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FINANCIAL STABILITY



NORGES BANK

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Introduction

During the recent global financial crisis, numerous banking institutions faced acute capital strain. In order to support banking sectors, many governments stepped in and propped up financial institutions, often at the expense of the taxpayer. As a result, much regulatory work has focused on implementing measures to improve the resiliency of the banking sector. Enhancing the effectiveness of capital buffers as well as the ability to efficiently resolve banks both on a going-concern and gone-concern basis have been a few of the primary goals of recent regulatory efforts. Contingent convertible (Coco) bonds have increased in popularity during recent years, as banks have sought to expand the robustness of their respective capital buffers and meet new, higher regulatory requirements. Coco bonds are hybrid securities, which can serve to function as equity under certain circumstances and, therefore, may qualify as regulatory capital under Basel III standards. Key characteristics of Coco bonds are that they maintain the following contractual aspects: 1) a pre-defined trigger mechanism, and 2) loss-absorption capacity. This memo will review the main features of Cocos and will also analyse observations in practice so as to provide an overview of European Coco market issuance, as well as pricing considerations.

Context and Purpose

Severe stress weighing on financial institutions' capital buffers during the financial crisis was a primary reason that governments internationally provided various forms of support to banking sectors. The capital strain and subsequent government support stemmed largely from the fundamental structure of bank balance sheets and the unique function banks continue to serve within an economy; specifically, they are large, leveraged organizations that play a central role in facilitating financial intermediation. In addition, a large proportion of bank activities are funded via retail deposits. Given these considerations, such banking activities warrant prudential regulation and supervision. While recent regulatory efforts have focused on various standards, capital adequacy has traditionally been an area of keen interest.

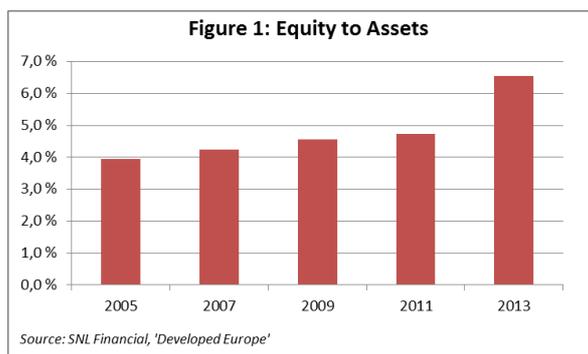
With the advent of risk-based regulatory capital standards, regulatory capital levels have largely been measured against risk-weighted assets (RWA) rather than total assets. Further, the application of Internal Models-based (IRB) approaches within the risk-based regulatory framework created a complexity that challenged the comparability of capital measures over time and across banks, largely due to the inconsistent calculation of risk.² As such, bank balance sheets could expand at a higher pace than that of bank equity levels in absolute growth terms. Over time, increasing leverage was built up in banking systems, making institutions vulnerable during times of financial stress.³ Principles introduced under the Basel III framework have sought to address this leverage issue by the inclusion of a minimum leverage ratio, based on non-risk weighted assets, as well as improving the quality and quantity of other regulatory capital requirements. In preparation for the implementation of

¹ The authors thank Sindre Weme, Ylva Søvik, Bent Vale, Jon Marius Bremnes, Jermund Molland and Johann Rud for useful input and comments.

² BCBS (2013a), BCBS (2013b)

³ BCBS (2011a)

such standards, banking system leverage within Europe has already declined, as noted in Figure 1 below.⁴



As previously indicated, the funding of banks has historically been accomplished largely through the acceptance of retail deposits. Retail depositors enjoy deposit protection provided by government-sponsored deposit guarantee schemes, as most retail depositors do not have the time or capacity to actively monitor the banks to which they extend credit, coupled with the fact that bank runs inhibit efficient financial intermediation. While banking organizations typically pay a premium for taking part in such guarantee schemes, premium pricing may not reflect actual risk-taking activities at the bank, potentially creating an asymmetric alignment of incentives. The government may retain responsibility for absorbing large losses at the bank, particularly if such losses greatly deplete the funds set aside for deposit protection, while on the other hand, the bank agents may stand to reap the rewards associated with such risk-taking activities.⁵ Moreover, there has been research focused on the efficacy of such deposit protection programs and whether these reduce the length and severity of banking crises.⁶

As observed during the recent crisis, bank failures can pose a large potential liability to taxpayers. This can occur through either debt-support measures, such as an increase in deposit-insurance levels⁷ and/or an explicit debt guarantee, or equity-support measures, such as a direct capital injection. Therefore, governments have since sought to maintain the resilience of banking systems while protecting the taxpayer. While much discussion has focused on the bail-in of creditors during a resolution/gone-concern situation, attention has also been given to addressing means by which other potential equity-support measures can be provided in the context of a non-resolution/going-concern situation. Toward this end, Cocos⁸ gained attention during the financial crisis as an option to provide non-public equity support to banking organizations that were not in the process of being wound down, with the first Coco issued by a bank, Lloyds, in the form of an exchange offer during 2009.⁹

⁴ BCBS (2011a)

⁵ The asymmetric risk-reward relationship has been cited as being amplified by executive pay packages at banks leading up to the financial crisis. Balachandran S. et al (2010) found that equity-based executive compensation at banks was tied to more excessive risk taking.

⁶ Demirgüç-Kunt and Detragiache (2002)

⁷ The 2008 bank run spurred by Northern Rock's financial woes supported the notion that improvement in the robustness of deposit protection schemes may be necessary to inhibit potential broader financial contagion. As a result, various governments across Europe boosted deposit guarantee levels in October 2008 (European Commission (2010)). While this debt-support effort would assist in the prevention of bank runs through higher deposit-protection levels, it also thereby added more potential liability to the taxpayer.

⁸ It should be noted that the structure of Cocos have been likened to that of catastrophe bonds, which emerged as an asset class during the 1990s in the aftermath of Hurricane Andrew as insurers sought to protect themselves from extensive losses.

⁹ Lloyds exchange offer – November 2009

Coco bonds maintain a contractual structure under which the debt can be transformed into equity support for banks under specific scenarios or ‘trigger events’. Coco bonds may be considered regulatory capital on an ex-ante or ex-post basis vis-à-vis the predefined trigger event. For purposes of this memo, Cocos are defined as bonds that are structured to include a trigger mechanism and a loss-absorption capacity. While both the trigger mechanism and loss-absorption capacity can take various forms, these characteristics are both predefined and explicit for the relevant bond under consideration. Further discussion surrounding the trigger mechanism and loss-absorption capacity is presented below.

Key Features

As noted, Cocos maintain an embedded trigger, serving as the reference point at which the loss-absorption capacity is activated, or the trigger event. A trigger may be activated at the point at which a bank’s ‘capital ratio falls below a specified level’ or at the discretion of the regulator. The following trigger types were listed by the Financial Stability Oversight Council (2012):

- Macroeconomic or systemic triggers would be activated during severe macroeconomic conditions or when financial system stress is very high, and therefore are not necessarily based on idiosyncratic considerations.
- Firm-specific, market-based triggers would rely on information derived from public share prices, debt prices, and/or credit default swap (CDS) premia.
- Firm-specific, non-discretionary regulatory or accounting-based triggers would rely on metrics such as specific data points or ratios related to the financial condition of the institution. These metrics, such as the common equity Tier 1 ratio, may already be observed by regulators and analysts, and can be based on data provided within regulatory reporting and/or financial statements.
- Supervisory discretionary triggers would allow the regulator to determine the point at which a trigger event should take place.¹⁰
- Hybrid triggers would maintain a dual-trigger structure that would be based on a combination of firm-specific triggers, regarding idiosyncratic factors, as well as systemic triggers, regarding macroeconomic factors.

Similar to the structure of the trigger, the loss-absorption feature of Coco bonds can take various forms. Loss absorption can be achieved through a partial write down or complete write off of the bond and/or through a partial or complete conversion to equity. Basel III does not distinguish between these loss-absorption capacities in terms of regulatory treatment for additional Tier 1-qualifying capital.¹¹ However, while equity conversion allows for potential upside gain after conversion, fixed income portfolio managers may be prohibited in their mandates from holding such securities. Therefore, these investors may prefer a write-down feature with respect to the loss-absorption capacity when investing in Cocos. Write downs may be temporary or permanent, depending on the specific characteristics of the issue. With the case of conversion to equity, a predefined conversion ratio will determine the amount of equity to be received in consideration for Coco bonds held. In both conversion and write-down cases, clarity in terms of how the loss-absorption feature is executed in practice will be central to facilitating Cocos pricing efficacy and efficient functionality in the marketplace. This is particularly true for the circumstances surrounding

http://www.lloydsbankinggroup.com/globalassets/documents/investors/2009/2009nov3_lbg_hybrid_capital_securities.pdf

http://www.lloydsbankinggroup.com/globalassets/documents/investors/2009/non-us_eom.pdf

¹⁰ Supervisory discretionary triggers are also known as point of non-viability (PONV) triggers.

¹¹ BCBS (2011a)

discretionary/PONV trigger events, where there may be inherent uncertainty in the marketplace regarding non-public factors potentially influencing the timing of such an event. In addition, Cocos structures may challenge the traditional hierarchy of the capital structure. For example, the loss-absorption capacity, in theory, could be triggered while shareholders still maintain an equity interest in the institution, suggesting that the yield on such Cocos could be higher than the expected return of the institution's common equity.

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Academic research

One of the issues discussed in academic research papers is the manner in which Cocos should be designed in order to achieve timely recapitalization of banks and to give the appropriate incentives to bank managers. Bank managers have the flexibility within accounting and banking regulation to use estimates and judgment that may influence financial statements and regulatory reports. Several authors are therefore skeptical of using accounting or regulatory ratios as triggers.¹² Accounting ratios have also been criticized on the grounds that they are backward looking. Market-based triggers, such as the market value of equity or CDS spreads, have been put forward as better-suited triggers, since these are forward looking and harder to manipulate.¹³ But even stock prices may be manipulated, particularly when stocks are traded in thin markets.

Several academic articles support highly dilutive conversion factors.¹⁴ Such conversion factors 'punish' shareholders by reducing the market value of their holding in the bank. These highly dilutive conversion factors, it is argued, will create an incentive for shareholders to raise equity well before a conversion is triggered. Such 'preemptive' equity issues will secure the soundness of banks. With respect to market-based triggers, however, Sundaresan and Wang (2014) show that for a unique competitive equilibrium to exist, there must be no value transfer between Cocos holders and shareholders at the time of conversion.

The possibility for the regulator to trigger conversion has been opposed on the ground that this will make the Cocos difficult to value. In addition, several authors point to regulatory forbearance as an argument against such discretionary triggers. Regulatory forbearance in this context means that regulators may be inclined to wait too long before they trigger a conversion.

Observations

This section summarizes the Cocos issuing activity of European banks.¹⁵ Specifically, this section reviews characteristics of these securities for the time period January 2009-June 2014. The following key observations were noted:

- Cocos were issued by 37 banks from twelve countries during the specified period with total face value volume of approximately €74 billion.
- The Cocos issuance market is becoming more active, as the majority (65%) of face value volume has been issued since the start of 2013.
- All the Cocos have a trigger based on a capital adequacy ratio, which varies in terms of ratio type and level. The regulatory capital ratios included the Common Equity Tier 1 (CET1) ratio, the Tier 1 ratio and the Total risk-based

¹² See, e.g., D'Sousa et al. (2009), Flannery (2009) and Calomiris and Herring (2011).

¹³ Example of articles advocating market based triggers are Flannery (2009), Calomiris and Herring (2011) and Hilscher and Raviv (2012).

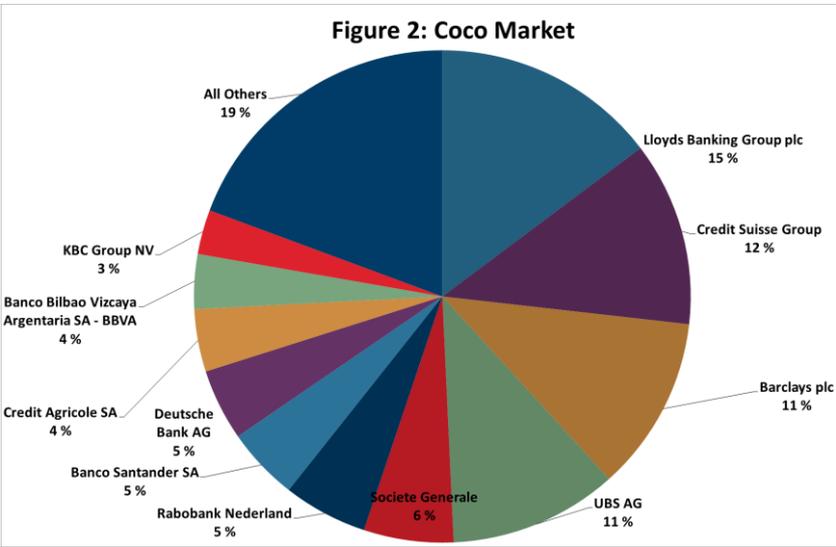
¹⁴ See, e.g., D'Sousa et al. (2009), Calomiris and Herring (2009), Hilscher and Raviv (2012) and Mc Donald (2013).

¹⁵ Data has been compiled from Dealogic, SNL Financial and Bloomberg. For purposes of this analysis, *European banks* include institutions where Dealogic has defined Europe as the 'Issuer Parent Region of Operations'.

capital (Total RBC) ratio, and trigger levels varied notably, ranging from 2% to 8.25%. Trigger reference notwithstanding, instruments qualifying as additional Tier 1 and Tier 2 capital under Basel III are also subject to supervisory discretionary triggers.¹⁶

- Most of the Cocos reviewed will be written down upon reaching the trigger level. However, this write down may not be permanent and can be partial, such that the conversion ratio is above zero, depending on the specific issue. Equity conversion, which was a key characteristic of the first Cocos issued by Lloyds, has been less common of late, but is still being utilized in the structuring of some Coco issues.
- The yields on Cocos are higher than those on Lower Tier 2 subordinated debt. Based on issue pricing observations from three large banks, the average spread differential between Cocos and subordinated debt was about 350 bps.

During the review period, about €74 billion of Cocos were issued by 37 European banks via 102 issues in twelve countries. A table in the Appendix provides a detailed overview of specific issue amounts by institution and year. While the €74 billion European Coco market is spread amongst 37 issuers, 81% of the market or €60 billion is comprised of eleven banks as noted in Figure 2 below. These eleven banks have each issued total Coco volume in excess of €2 billion. The majority of these eleven large issuers (73%) are designated as Global-Systemically Important Banks (G-SIBs) by the Financial Stability Board.¹⁷ Collectively, G-SIB issuers hold a notable 58% share of the Coco market. On an individual-bank basis, Lloyds was the largest issuer of outstanding Cocos with a 14% share of the European market, followed by Credit Suisse with approximately 12%. Barclays and UBS were the third largest issuers with market shares approximately 11% each.

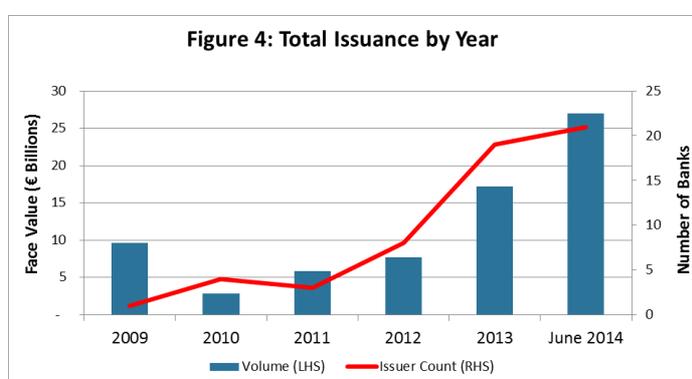
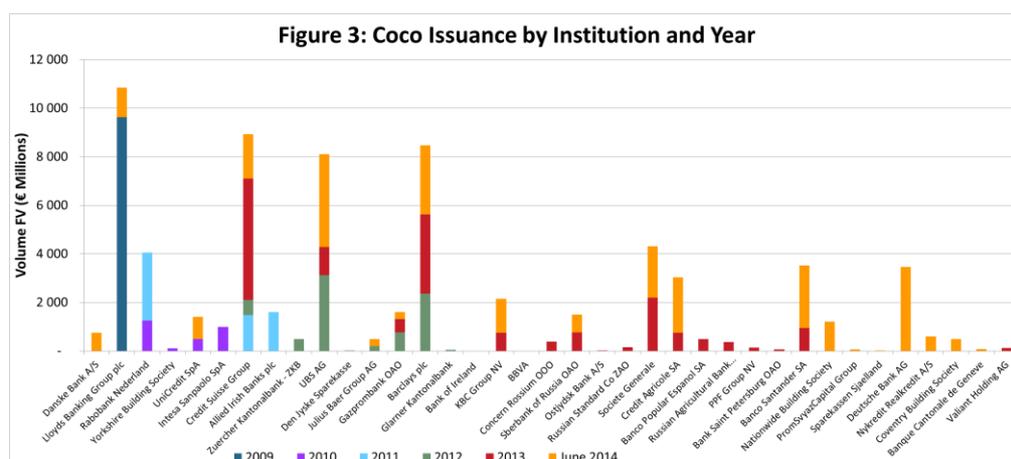


¹⁶ Consistent with Basel III standards for all non-common Tier 1 and Tier 2 instruments, under the Bank Resolution and Recovery Directive (BRRD), relevant authorities will be able to determine the PONV, at which time the bail-in of additional Tier 1 and Tier 2 instruments via write down or conversion may be put into effect (European Commission (2014)). It should be noted that other, non-Coco debt may also be subject to loss absorption at the PONV. In addition, Cocos can be issued without a PONV trigger, but such instruments may not count as qualifying regulatory capital.

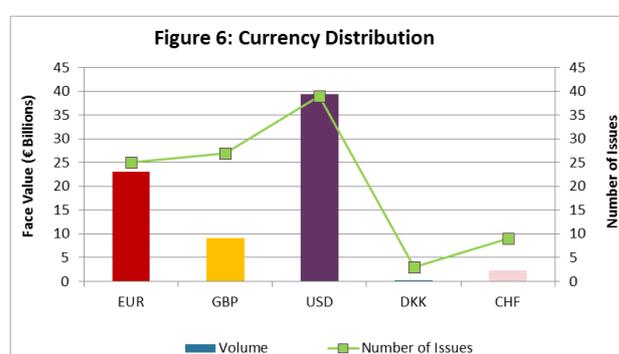
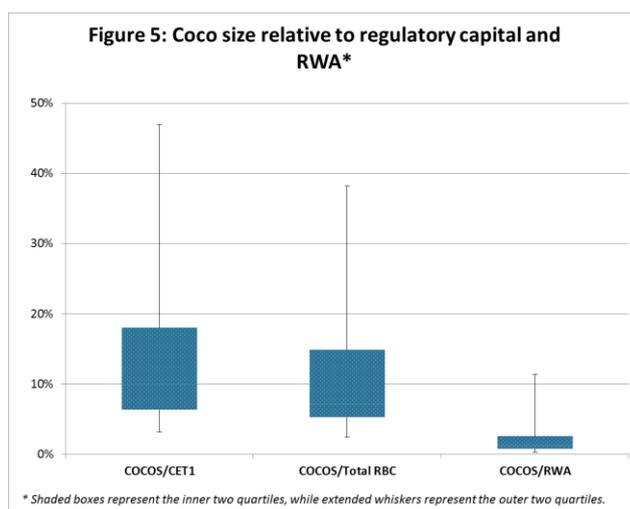
<http://www.bis.org/press/p110113.pdf>

¹⁷ Financial Stability Board (2014)

Lloyds was the first bank to issue Cocos in 2009, as part of an exchange offer to existing hybrid debt holders approximately one year after the UK government acquired a 43% stake in the concern in October 2008. After a large €9.6 billion Coco issuance by Lloyds in November 2009, overall Coco issuance activity was rather subdued during the subsequent two years. Specifically, Rabobank, Yorkshire Building Society, Unicredit and Intesa Sanpaolo were active with issuances in 2010, as noted in Figure 3 below, but face value issuance volume totaled only €2.9 billion. Rabobank was active again in 2011, alongside Credit Suisse and Allied Irish Banks, and primary market volume expanded to €5.9 billion. Since 2010, the total volume of Cocos issued has been rising steadily, as noted in Figure 4 below with approximately 65% of issues being placed since the start of 2013. During the first half of 2014 alone, there have been 21 issuers placing a total of €28 billion in Cocos, or 39% of the European Coco market. The expansionary trend in this market should likely continue, supported by higher capital requirements coupled with the fact that Cocos may qualify as regulatory capital under Basel III. In addition, Cocos may be used to fulfill minimum bail-in requirements under the BRRD, thereby adding clarity as to how the capital structure can be used to provide equity support in certain scenarios.¹⁸ While more senior creditors may also be subject to bail-in, the Coco buffer provides a layer of structural protection to these creditors and should reduce the institution’s funding costs to such creditors. As noted in Figure 5 below, Cocos represent a notable proportion of issuing banks’ regulatory capital at present.



¹⁸ European Commission (2014)



Placements in the Coco market have been largely achieved through EUR- and USD-denominated issues, as noted in Figure 6, which can be expected given the large size of these currencies overall within bank funding markets. While the range of reference triggers spans 2%-8.25%, the majority of issues (59%) have a trigger in the range of 5%-5.25%. As noted in Figures 7a and 7b below, the CET1 reference ratio is the most common trigger. Cocos with a CET1 trigger of 5%-5.125% represent the majority (53%) of the overall Coco market in terms of face value.¹⁹ Cocos with a 5.125% trigger have become more common than those with a 5% trigger during recent years. This is likely due to the fact that under Basel III requirements, additional Tier 1-qualifying capital must have a trigger of at least 5.125%.²⁰ Interestingly, only 12% of Coco issues maintain a trigger reference level that is below the absolute minimum capital requirement for that respective regulatory capital type under Basel III requirements.²¹ As higher trigger Cocos may appeal to regulators due to their ability to provide capital on a going-concern basis, such instruments will likely continue to be more expensive relative to issuing lower trigger instruments.²² This could explain why the majority of Cocos issued have maintained triggers that have been equal to or below 5.125%.

It is reasonable to assume that, for a given issuer, an instrument with a lower trigger reference would be relatively cheaper and therefore have a lower spread compared to a

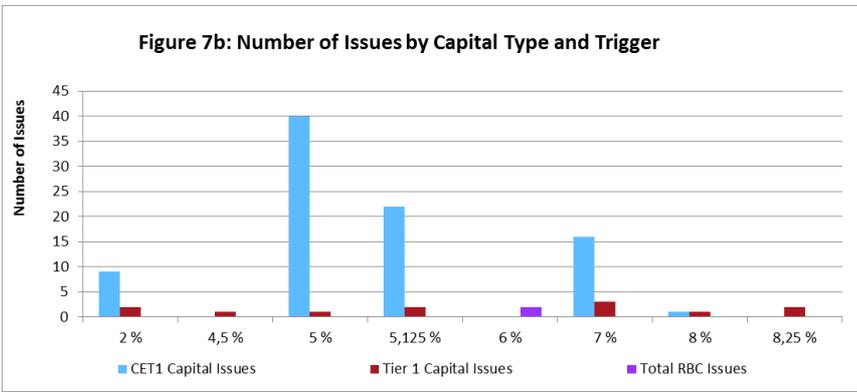
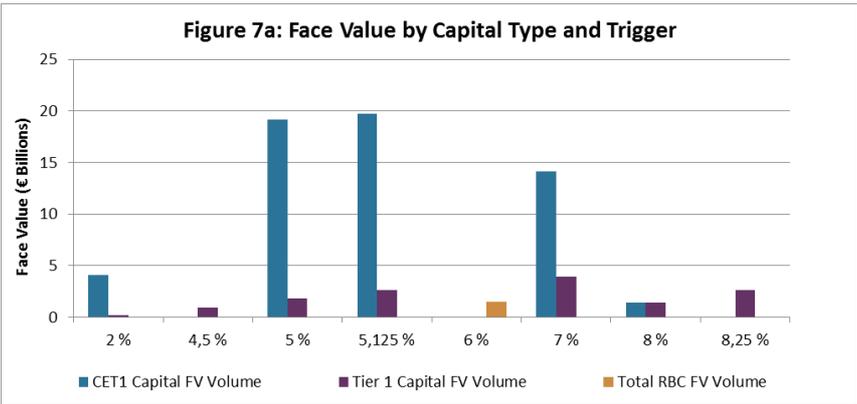
¹⁹ For purposes of this analysis, 'Core Tier 1' and 'Common Equity Tier 1' references are grouped together, and are both referred to as the CET1 reference ratio. This was done for simplification purposes given the current transition in the definition of such regulatory capital under Basel III standards.

²⁰ BCBS (2011b)

²¹ This refers to absolute minima regulatory capital ratios, and does not take into account buffers, such as the capital conservation buffer and the countercyclical capital buffer, as well as any international or domestic capital charges relating to 'systemically important' considerations. It also does not consider any other regulatory capital requirements, which may come in addition to what is outlined under Basel III.

²² BCBS (2013c)

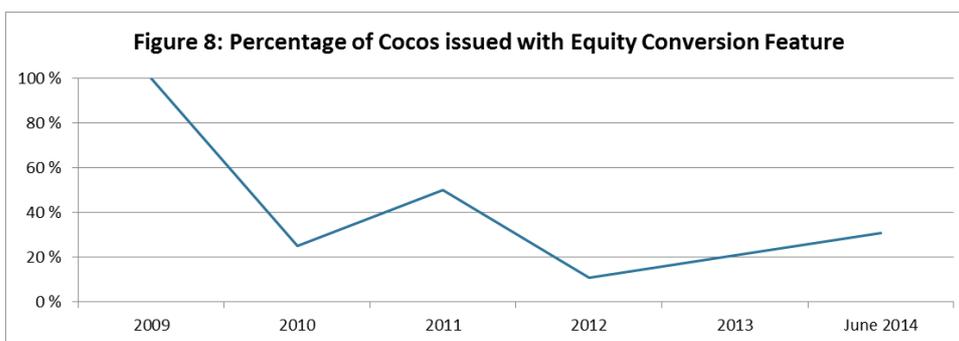
similar instrument with a higher trigger reference.²³ However, in reviewing a few select cases where different triggers on Cocos issued by the same issuer were noted, the evidence was mixed. For example, Credit Suisse had outstanding Cocos with various triggers; two of these triggers included a CET1 ratio of 5.125% and a CET1 ratio of 7%. In this example, the average spread differential relative to the Mid-Swaps reference rate at 30 June 2014 was only 42 basis points, with the higher trigger Cocos traded at a tighter spread relative to the lower trigger Cocos.²⁴ In this example, the pricing difference may be attributed to the fact that the 7% trigger Cocos maintained an equity conversion feature, rather than a permanent write-down feature, which was an attribute of the 5.125% Cocos. The equity conversion feature could be considered as more valuable to investors due to the potential for upside gain after a trigger event. In the case of Santander, there were two triggers observed; one was a 4.5% Tier 1 ratio trigger and the other was a 5.125% CET1 ratio trigger. While these two different reference triggers are not directly comparable, in relative terms a 4.5% Tier 1 capital ratio is notably below a 5.125% CET1 ratio. In this case, the prices²⁵ observed in these different issues varied distinctly; at 30 June 2014, the Cocos with the higher trigger were trading relative to the Mid-Swaps reference rate at a premium of 144bps compared to those with the lower trigger. This pricing differential represents what one may reasonably expect in comparing higher trigger Cocos with lower trigger Cocos; specifically, the higher trigger Cocos should price at a premium relative to the lower trigger Cocos, because, for any one institution, reaching a 4.5% Tier 1 ratio is distinctly less likely than reaching a 5.125% CET1 ratio.



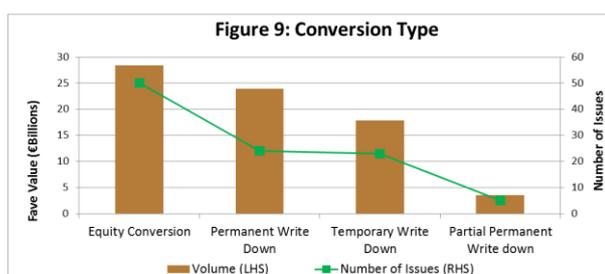
²³ It should be noted that other varying features between individual Cocos issues could also influence this spread differential, such as currency denomination, maturity difference, liquidity premia, regulatory capital qualification and conversion type.

²⁴ Credit Suisse Cocos referenced included CHF and USD denominations.

²⁵ Santander Cocos referenced included USD and EUR denominations.



Whereas the first Cocos issued by Lloyds in 2009 had an equity conversion feature, most Cocos issued of late have instead maintained a write-down feature for the loss-absorption capacity as noted in Figure 8 above. This write down varies in terms of being partial or full, and permanent or temporary, as noted in Figure 9. If the write down is temporary, the Coco holder may be eligible to have its former claim reinstated if the bank returns to a sound financial condition. As noted in Figure 10, about half of the Cocos issued qualify as Tier I capital, with the remaining qualifying as Tier II capital. While securities in the fixed income market have traditionally maintained a heterogeneous set of characteristics, the additional set of varying features inherent in Coco instruments adds another layer of prospects to the investment opportunity set.



Pricing

Relative pricing differences in debt instruments from a single issuer with similar maturities and denominations should represent the hierarchy of the capital structure, considering expectations of both default and loss given default. As such, more secured instruments should have tighter spreads relative to less secured instruments. In this simplified context, within any one single issuer's debt capital structure, Cocos should have the highest yield, due to their relatively lower ranking and explicit loss absorption capacity. On the other end of the spectrum, secured-debt instruments should have the lowest yield, due to their relatively higher seniority in the capital structure and collateral and/or security. After the collateral and/or security claim for secured debt is exhausted, secured debt and senior unsecured debt should rank *Pari passu*. Non-Coco subordinated debt should rank junior to senior debt and Cocos should rank junior to non-Coco subordinated debt. Box 1 provides a stylized theoretical pricing example for write-down Cocos. Direct comparisons of actual observed primary market pricing across the capital structure can be very challenging, as issuers rarely issue several types of instruments at the same time with similar terms and denominations. Often issuance will be based upon considerations of funding needs as well as the market appetite to absorb instruments at various prices. For example, in certain circumstances, such as during a time of market stress or a period of weak financial performance from an idiosyncratic perspective, an issuer under strain may be able to issue a collateralized instrument, but not a Coco at an acceptable spread.

Box 1: Numerical Example

This box contains a stylized example to illustrate pricing of Cocos^Ω within a Black & Scholes and Merton pricing framework. Today the bank has assets (A_t) of 100, which are financed by equity (E_t) of 5, a complete write-down Coco of 5 and other unsecured debt of 90. The assets' average risk weight of 0.4 equates to a capital adequacy ratio (CAR) today of 12.5% ($5/100 \cdot 0.4$). The CAR after one period (at time T) is $(E_t + \Delta A)/(A_t + \Delta A) \cdot 0.4$, where it is assumed that changes in asset value (ΔA) are directly reflected in the equity.

It is assumed that the asset value of the bank at the end of the period is distributed between the holders of equity, Cocos and unsecured debt. The Coco is completely written down if the CAR at time T (immediately before the bank is dissolved) is at or below the trigger K_2 , as noted in Figure 1A. If the bank used subordinated debt instead of a Coco, the payoff to shareholders would have been structured as in Figure 1B. The payoff would have been equal to the payoff of a call option on the bank's assets with a strike equal to total debt (95). With a Coco, the cash flow to shareholders should be as depicted in Figure 1C. The write down of the Coco at the trigger K_2 increases the level of equity by the Coco's face value. Shareholders will not receive any payoff if the value of assets is below the level of unsecured debt (90).

Table 1 shows the value today of equity and other instruments under various assumptions of asset volatility. A risk-free interest rate of 3% and a period of 1 year are used in the computations. The value and the yield on unsecured or 'other' debt are not influenced by the level of the Coco trigger, or by whether Cocos or subordinated debt are used. This means that the Coco trigger only influences the distribution of the net entity value (asset value – value of unsecured debt) between Coco holders and shareholders. The value of equity is generally higher when Cocos are used instead of subordinated loans, and it is also larger for higher trigger levels. Figure 2 shows that the Coco yield increases as volatility increases.

Figure 1: Payoffs at time T

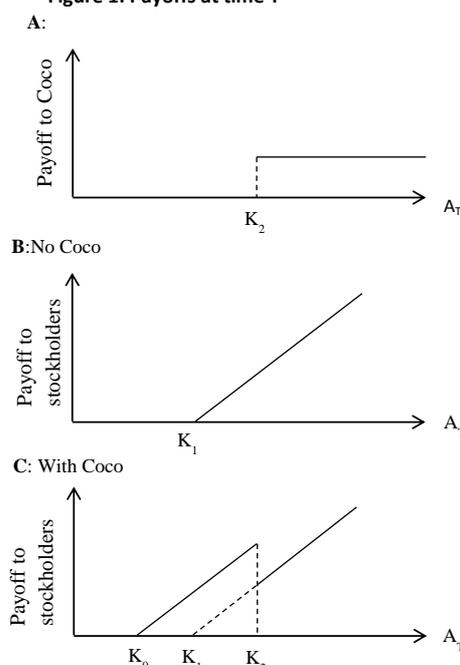
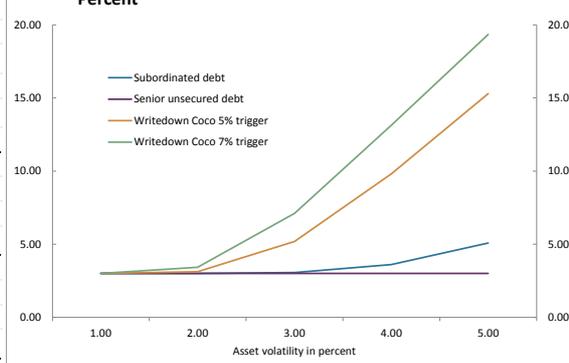


Table 1

Asset volatility ¹⁾	1.00	2.00	3.00	4.00	5.00
With subordinated debt					
Value equity	7.81	7.81	7.81	7.84	7.91
Value sub. debt	4.85	4.85	4.85	4.82	4.75
- implied yield ¹⁾	3.00	3.00	3.06	3.61	5.08
Value other debt	87.34	87.34	87.34	87.34	87.34
- implied yield ¹⁾	3.00	3.00	3.00	3.00	3.01
Sum value	100.00	100.00	100.00	100.00	100.00
With writedown Coco - 5 percent trigger					
Value equity	7.81	7.81	7.91	8.13	8.37
Value Coco	4.85	4.85	4.75	4.53	4.29
- implied yield ¹⁾	3.00	3.12	5.19	9.81	15.29
With writedown Coco - 7 percent trigger					
Value equity	7.81	7.83	8.00	8.28	8.54
Value Coco	4.85	4.83	4.66	4.38	4.12
- implied yield ¹⁾	3.00	3.42	7.11	13.14	19.35

1) Numbers in percent.

Figure 2: Yield on debt instruments and asset volatility. Percent



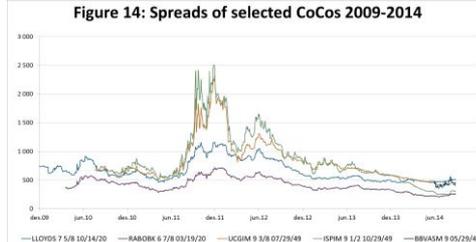
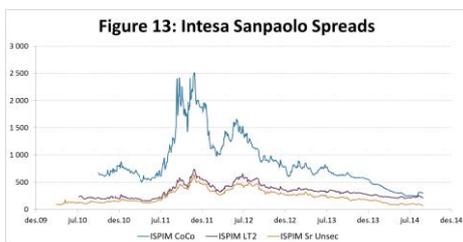
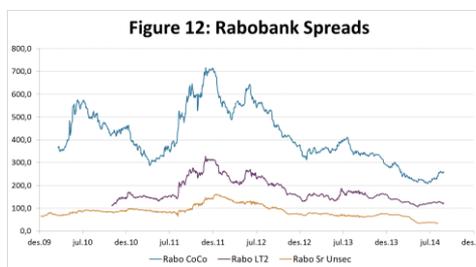
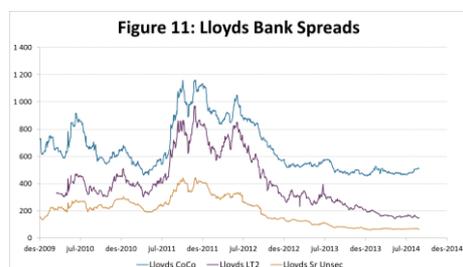
Ω: In this example the face value of the Coco is high compared to equity, and the trigger is based on the equity level alone. Other, more complex triggers could be accommodated within this pricing framework.

Table 1: Average Spreads Observed in Secondary Market[#]

Issuer	Coco	Lower Tier 2	Senior Unsec	Coco Min	Coco Max	Coco SD	Coco Issue Date	Conversion Type
Lloyds	671	422	203	456	1162	186	November 2009	Equity Conversion
Rabobank	424	179	88	208	717	119	March 2010	Partial Perm Write Down
Intesa	903	338	243	248	2508	471	September 2010	Temporary Write Down

[#] Source: Bloomberg, Basis Points over Swaps - Issuance Date until June 2014

With respect to observed Coco pricing, it should be noted that the Coco market is relatively nascent and growing, with limited trading activity; as such, the availability of pricing observations is relatively narrow. Therefore, this pricing section will review secondary pricing trends for a few select issues, which exhibited robust pricing data in terms of the Cocos being actively traded. As expected, Cocos have been trading at spreads higher than those of subordinated debt by the same issuer with an average spread differential of about 350 bps in the selected observations for Lloyds, Rabobank and Intesa Sanpaolo. Specific spread differentials can be observed in Table 1. In pricing considerations, all yield spread levels referenced herein are relative to the Mid-Swaps reference rate. Spreads move in similar manners across the various types of securities issued by a single issuer, as noted in Figures 11-14 below. The relative differences in pricing observed across the capital structure of a single issuer should represent the perceived differences in loss given default across the various securities. Prices of Cocos also move in a similar manner relative to each other across different issuers, reflective of perceived differences in credit risk or probability of default between issuers, as noted in Figure 14. However, these also may move in relatively similar patterns, largely due to overall market conditions. As previously noted, currently Cocos are generally not as actively traded as other securities within an issuer’s capital structure. This factor could also support the existence of a liquidity premium that may be priced into the overall spreads required by these securities.



While Cocos clearly have explicit downside risks in terms of loss absorption relative to more traditional debt instruments, key features inherent in these instruments do add an element of clarity on how the capital structure may be used for loss-absorption purposes in practice. In addition, considering the large amount of issuances to date, there is clearly a market for these relatively new instruments. Given the current low interest-rate environment, investors are able to obtain relatively higher yields by adding exposure to this asset class, and are thereby provided with the new set of risk-reward characteristics inherent in such exposures. Due to the fact the Cocos will likely be the first debt security subject to loss absorption, they will likely continue to price outside the subordinated debt of the same issuer. While there is some evidence of

spread tightening in the select examples during recent years, this could be attributed to overall trends in broader capital markets. If a trigger event were to occur, large pricing swings may be observed and overall spreads will likely be much higher in the Cocos impacted relative to other debt securities across an issuer's capital structure. Such price changes may have contagion effects on other securities in the capital structure of the same issuer, Cocos issued by other issuers, and/or the broader market overall. As such, clarity on how trigger events will play out in practice should serve to enable efficient pricing efficacy and work toward limiting volatility in this growing market. This is particularly true in consideration of potential PONV triggers, where the market may not foresee an event triggered by non-public, supervisory information.

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'Too big to fail' Regulation in Switzerland

The two big Swiss banks Credit Suisse and UBS have issued Cocos amounting to 23% of the face value of all Cocos issued by European banks, as noted in Figure 2. UBS and Credit Suisse have issued Cocos with both high and low triggers as per Swiss Standards for trigger levels. Cocos play an important role in the capital regulation of 'too big to fail' banks in Switzerland. This regulation was introduced in 2013 and will be fully implemented in 2019. According to this regulation there are three categories of regulatory capital that, when fully implemented, will sum to about 19% of risk-weighted assets: i) Basic requirement capital (4.5% CET1), ii) Buffer capital (8.5% CET1 or high trigger Cocos)²⁶ and iii) Progressive component capital (up to 6% low trigger Cocos only).²⁷

Table 2 - Select Swiss Coco Issuance^β

Deal Pricing Date	Issuer Parent	ISIN	Face Value (€)	Coupon	Tier Capital	Currency	Type	Trigger Ratio	Trigger
17.02.2011	Credit Suisse Group	XS0595225318	1 480 768 519	7.875%	Tier II capital	USD	EC	CET1	7,000 %
19.01.2012	Zuercher Kantonalbank - ZKB	CH0143808332	487 704 071	3.500%	Tier I capital	CHF	PPW	CET1	7,000 %
15.02.2012	UBS AG	XS0747231362	1 519 987 840	7.250%	Tier II capital	USD	PWD	CET1	5,000 %
08.03.2012	Credit Suisse Group	CH0181115681	622 200 100	7.125%	Tier II capital	CHF	EC	CET1	7,000 %
10.08.2012	UBS AG	US90261AAB89	1 614 661 123	7.625%	Lower Tier II capital	USD	PWD	CET1	5,000 %
15.05.2013	UBS AG	CH0214139930	1 155 490 506	4.750%	Tier II capital	USD	PWD	CET1	5,000 %
01.08.2013	Credit Suisse Group	XS0957135212	1 884 161 736	6.500%	Tier II capital	USD	PWD	CET1	5,000 %
21.08.2013	Credit Suisse Group	CH0221803791	202 913 843	6.000%	Tier I capital	CHF	PWD	CET1	5,125 %
11.09.2013	Credit Suisse Group	XS0972523947	1 250 000 000	5.750%	Tier II capital	EUR	PWD	CET1	5,000 %
04.12.2013	Credit Suisse Group	XS0989394589	1 658 986 175	7.500%	Tier I capital	USD	PWD	CET1	5,125 %
06.02.2014	UBS AG	CH0236733827	2 000 000 000	4.750%	Lower Tier II capital	EUR	PWD	CET1	5,000 %
12.05.2014	UBS AG	CH0244100266	1 816 926 487	5.125%	Tier II capital	USD	PWD	Tier 1	5,000 %
10.06.2014	Credit Suisse Group	XS1076957700	1 835 131 762	6.250%	Tier I capital	USD	PWD	CET1	5,125 %

^β Sources: Dealogic, Bloomberg. Within the Type column, EC = Equity Conversion, PPW = Partial Permanent Write Down and PWD = Permanent Write Down.

The high (low) trigger is 7% (5%) in terms of the CET1 capital ratio. Cocos with high or low triggers may be referred to respectively as going- or gone-concern capital. If bank resolution is triggered when the low trigger is reached, the bank will go into resolution with a CET1 ratio of about 11% (5% + 6%).

Summary

In light of vulnerabilities noted during the recent financial crisis, regulatory efforts have focused on improving various prudential standards and have resulted in more stringent regulatory capital requirements internationally. These new requirements aim to improve both the quality and quantity of bank capital, and should reduce the likelihood and size of potentially expensive taxpayer bailouts. Cocos have an explicit loss-absorption feature that may be exercised under pre-defined scenarios, potentially providing a level of clarity on how the capital structure can be used in practice for generating equity support on both a going- and gone-concern basis. The inclusion of supervisory (PONV) triggers give the regulator an additional tool in facilitating the

²⁶ A maximum 3% of the 8.5% buffer may be high-trigger Cocos.

²⁷ The size of the progressive component will depend on the size and the market share of the bank.

recapitalization of an institution; however, in practice exercising a PONV trigger may come as a surprise to the marketplace, thereby potentially challenging the same clarity these securities may be able to provide. As such, clear and efficient communications surrounding such trigger events are warranted to ensure the proper functionality of this growing market. In addition, until more observations are available on how Coco triggers and loss absorption function in practice, consideration should be given as to which investor groups are appropriately suited for exposure to such an asset class.

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Appendix – Detailed Table of Cocos Issued (Face Value € Millions)

Issuer	2009	2010	2011	2012	2013	June 2014	Total
Lloyds Banking Group plc	9 639	-	-	-	-	1 215	10 854
Rabobank Nederland	-	1 250	2 805	-	-	-	4 055
Yorkshire Building Society	-	112	-	-	-	-	112
UniCredit SpA	-	500	-	-	-	906	1 406
Intesa Sanpaolo SpA	-	1 000	-	-	-	-	1 000
Credit Suisse Group	-	-	1 481	622	4 996	1 835	8 934
Allied Irish Banks plc	-	-	1 600	-	-	-	1 600
Zuercher Kantonalbank - ZKB	-	-	-	488	-	-	488
UBS AG	-	-	-	3 135	1 155	3 817	8 107
Den Jyske Sparekasse	-	-	-	7	-	-	7
Julius Baer Group AG	-	-	-	207	-	286	493
Gazprombank OAO	-	-	-	763	555	283	1 602
Barclays plc	-	-	-	2 363	3 270	2 845	8 479
Glarner Kantonalbank	-	-	-	58	-	-	58
Bank of Ireland (Governor & Co of)	-	-	-	-	1 000	-	1 000
KBC Group NV	-	-	-	-	752	1 400	2 152
Banco Bilbao Vizcaya Argentaria SA - BBVA	-	-	-	-	1 151	1 500	2 651
Concern Rossium OOO	-	-	-	-	383	-	383
Sberbank of Russia OAO	-	-	-	-	770	729	1 499
Ostjyds Bank A/S	-	-	-	-	7	-	7
Russian Standard Co ZAO	-	-	-	-	156	-	156
Societe Generale	-	-	-	-	2 206	2 106	4 312
Credit Agricole SA	-	-	-	-	753	2 280	3 033
Banco Popular Espanol SA	-	-	-	-	500	-	500
Russian Agricultural Bank OAO - Rosselkhozbank	-	-	-	-	369	-	369
PPF Group NV	-	-	-	-	148	-	148
Valiant Holding AG	-	-	-	-	123	-	123
Bank Saint Petersburg OAO	-	-	-	-	74	-	74
Banco Santander SA	-	-	-	-	945	2 583	3 528
Nationwide Building Society	-	-	-	-	-	1 214	1 214
PromSvyazCapital Group	-	-	-	-	-	72	72
Sparekassen Sjaelland	-	-	-	-	-	9	9
Deutsche Bank AG	-	-	-	-	-	3 459	3 459
Nykredit Realkredit A/S	-	-	-	-	-	600	600
Coventry Building Society	-	-	-	-	-	500	500
Banque Cantonale de Geneve	-	-	-	-	-	90	90
Danske Bank A/S	-	-	-	-	-	750	750
Total	9 639	2 862	5 886	7 643	19 312	28 480	73 822

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BONDS (COCOS) ISSUED BY
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References

Admati, Anat R., P. DeMarzo, M. Hellwig, and P. Pfleider (2013). “Fallacies, Irrelevant Facts, and Myths in the Discussion of Capital Regulation: Why Bank Equity is Not Expensive.” Working Paper. Stanford University, October.

Balachandran, S., B. Kogut, and H. Harnal (2011). “Did Executive Compensation Encourage Extreme Risk-taking in Financial Institutions?” Unpublished Working Paper.
<https://www0.gsb.columbia.edu/mygsb/faculty/research/pubfiles/5388/extreme%20risk%20financial%20services%20compensation%20balachandran%20kogut%20harnal%20v2.pdf>

BCBS (2011a). “Basel III: A global regulatory framework for more resilient banks and banking systems”, June, Basel Committee on Banking Supervision.
<http://www.bis.org/publ/bcbs189.pdf>

BCBS (2011b). “Basel III definition of capital – Frequently asked questions”, December, Basel Committee on Banking Supervision.
<http://www.bis.org/publ/bcbs211.htm>

BCBS (2013a). “Simplicity, risk sensitivity and comparability: The Regulatory balancing act”, February, Basel Committee on Banking Supervision.
<http://www.bis.org/speeches/sp130226.pdf>

BCBS (2013b). “Regulatory Consistency Assessment Programme (RCAP) – Analysis of risk-weighted assets for credit risk in the banking book”, July, Basel Committee on Banking Supervision.
<http://www.bis.org/publ/bcbs256.pdf>

BCBS (2013c). “Global systemically important banks: updated assessment methodology and the higher loss absorbency requirement”, July, Basel Committee on Banking Supervision.
<http://www.bis.org/publ/bcbs255.pdf>

Calomiris, C and R. Herring (2011). “Why and How to Design a Contingent Convertible Debt Requirement”, April. in Y Fuchita, R Herring and R Litan (eds), Rocky times: new perspectives on financial stability, Chapter 5, Brookings/NICMR Press.

European Commission (2010). “Impact Assessment Accompanying document to the Proposal for a Directive on Deposit Guarantee Schemes”, July, Commission Staff Working Document.
http://ec.europa.eu/internal_market/bank/docs/guarantee/20100712_ia_en.pdf

European Commission (2014). The EU Single Market, Banking, Crisis Management, April, Bank Resolution and Recovery Directive.
http://ec.europa.eu/internal_market/bank/crisis_management/index_en.htm
<http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32014L0059>

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BONDS (COCOS) ISSUED BY
EUROPEAN BANKS

Demirgüç-Kunt, Asli and E. Detragiache (2002). “Does deposit insurance increase banking system stability? An empirical investigation”, *Journal of Monetary Economics*, Volume 49, October, pages 1373–1406

D’Souza, Andre, B. Foran, G.E. Hafez, C. Himmelberg, Q. Mai, J. Mannoia, R. Ramsden, S. Romanoff, (2009). “Ending ‘Too Big To Fail’”, December. Goldman Sachs Global Markets Institute, New York.

Financial Stability Board (2014). “2014 update of group of global systemically important banks”, November.

http://www.financialstabilityboard.org/wp-content/uploads/pr_141106b.pdf

Financial Stability Oversight Council (2012). “Report to congress on study of a contingent capital requirement for certain nonbank financial companies and bank holding companies”, July.

[http://www.treasury.gov/initiatives/fsoc/studies-reports/Documents/Co%20co%20study\[2\].pdf](http://www.treasury.gov/initiatives/fsoc/studies-reports/Documents/Co%20co%20study[2].pdf)

Flannery, M. (2009). “Stabilizing large financial institutions with contingent capital certificates”, Working Paper, University of Florida, <http://ssrn.com/abstract=1485689>

Hilscher, J. and A. Raviv (2012), “Bank stability and market discipline: The effect of contingent capital on risk taking and default probability”. Brandeis University Working Paper, 53.

McDonald, R. (2013), “Contingent capital with a dual price trigger”, *Journal of Financial Stability*, 9, pp. 230-241.

Sundaresan, S. and Z. Wang (2014). “On the design of contingent capital with market Trigger”. *Journal of Finance*, forthcoming.

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