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Managing the Terms for Converting CoCos

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Abstract: This article lays out key features of cocos debt securities and how the choice of their trigger levels and conversion terms into common equity tier 1 (CET1) affect the principal stakeholders in the issuing banks. Some of the choices favor pre-existing shareholders and others the new shareholders by conversion. Conversion of cocoses need not be dilutive; they also do not have to prove subordinate to the most junior inconvertible debt, as frequently assumed. The goal here is to help correct such misconceptions by demonstrating that expected outcomes are shaped by the issuers of cocos and not inherent features of the instrument. Balance-sheet analysis will show that conversion is a zero-sum activity so that what the former cocos holders lose pre-existing shareholders gain, and vice versa. However, the size of net gains and net losses, and who should bear them, are contentious. If management is properly incentivized to keep cocos as additional tier 1 (AT1) capital on the balance sheet the bonds could furnish CET1 in a financial crisis when such capital is most needed and least available.

Keywords: Contingent convertible bonds, CoCos, capital requirements for banks, hybrids, financial crisis, Basel III

1 Introduction

Contingent convertible debt securities, known as CoCos, CoCoses, or simply cocos, constitute a promising instrument innovation spurred by the 2007-2009 financial crisis. Issuing cocos can lower the cost of regulatory capital held by banks and help boost their capital ratios. It advances the stability of the financial system by lowering bankruptcy risk and the cost of bankruptcy resolution should bankruptcy occur nonetheless. In spite of the promise of this new reform instrument, there is still widespread disagreement over the appropriate design of cocos, and over the goals and consequences of their conversion into equity when triggered. This is perhaps not surprising since the instrument is still young, not fully standardized in design, and as yet untested in actual conversions. Here are two fairly recent examples of mischaracterizations in the press of the country that pioneered cocos:

1. From the *Financial Times* of February 9, 2016: "Cocos are the riskiest debt issued by banks." This statement need not be correct, least of all for cocos with high capital-ratio triggers for conversion into equity. Such cocos would have considerable value left when they are converted to equity outside bankruptcy, and that equity would be more liquid than the cocos debt. Deeply subordinated bailinable inconvertible debt could easily end up being worth less, and hence riskier, than high-trigger cocos. The quotation above from Hale and McCrum (2016) could be applicable to write-down-only cocos provided they are issued without a contingent write-up feature that could be activated under more favorable circumstances with regulators' permission. However, their article addresses cocos bonds which "transform automatically from debt to equity when certain conditions are met". Such cocos are not the riskiest type of debt that has been issued.
2. *The Guardian* of February 10, 2016: "The market [for CoCo bonds] is only around three years old but is now an important source of financing for banks, and is estimated to be worth around €95bn (£73bn) globally." This quote from Fletcher (2016) contains factual inaccuracies. The first major issues of cocos (in several currencies) came in late 2009, making this market is at least seven years old. Furthermore, based on data cited in the next section, the cumulative amount of cocos issued by yearend 2015 was about two-and-a-half times as large as the €95 reported above.

Thus various data errors and false presumptions about how cocos should be ranked and what cocos conversion can or should do to stakeholders recur in the financial press. Alarming crisis scenarios with cocos can also be found under "risk factors" in prospectuses for cocos and in professional warnings of death traps or death spirals that may incite fears of conversion.

Correcting factual inaccuracies or false generalizations is part of the motivation for this paper as laid out in Section 2. A rigorous treatment follows in Section 3 of the factors determining how the zero-sum net gains and hence net losses from cocos cancellation and conversion are distributed between pre-existing shareholders and the holders of the newly-issued shares acquired through conversion. So far major banks have gone out of their way to avoid conversion even when they were in dire straits. This undercuts the usefulness of cocos for recovery and reveals a reluctance to issue them voluntarily. Swiss banks organized as stock corporations were unique in the world for having been subjected to their regulators' mandates to issue both high- and low-trigger cocos. This made UBS and Credit Suisse frequent issuers of cocos. We are here, however, more interested in the design most appropriate for voluntary issuance. Section 4 therefore debates which distribution of gains and losses from conversion would be most desirable and also achievable under the prevailing state of corporate governance by setting the corresponding conversion price. It also shows that the effectiveness of cocos and the credibility of their charter may depend on keeping the trigger level of the capital ratio well above the minimum capital requirement to protect the automaticity of conversion from regulatory overrides that would follow from an official finding of non-viability of a bank. *For readers not already familiar with cocos and their operation, the Appendix explains the applicable capital ratio requirements and how they can be met.*

2 Some of the Most Common Misrepresentations and Improper Generalizations

This section characterizes the most common misapprehensions and unwarranted generalizations about the subgroup of cocos that actually convert into common stock when triggered. Here is a partial list:

a Cocos conversion is frequently characterized as inherently dilutive for pre-existing shareholders. However, the permanent cancellation of the debt associated with conversion into common shares raises equity while increasing the number of common shares outstanding at the same time. Hence there will be dilution only if the percentage increase in the number of shares outstanding due to conversion into common shares is greater than the percentage increase in equity from cancellation of the cocos debt. Dividing the principal of cocos by the conversion price yields the number of shares of common stock issued at conversion. As will be demonstrated, dilution of the stake of pre-existing shareholders will result from this stock issue only if the conversion price is lower than the share price at conversion.

While the accounting proof for these propositions will follow in a later section, the intuition is as follows: The principal amount of cocos and their conversion price, fixed in advance, determine the number of shares which coco holders obtain from conversion. The value they receive as their debt is cancelled thus fluctuates directly with the market price. Pre-existing shareholders, on the other hand, obtain debt relief from the cancelled principal amount of cocos that is fixed in the chosen currency. The number of shares they could obtain from this fixed dollar amount is therefore inversely related to the share price. If the market price per share of common stock at conversion is equal to the conversion price, neither group has a net loss as each is fully compensated for cocos cancellation and the increased number of shares outstanding due to conversion, respectively. If the ratio of the two prices is greater than 1 the (former) coco holders have a net gain and pre-existing shareholders lose on balance. The converse applies for a ratio of less than 1.

b As a matter of policy, regulators and others have advocated that conversion should be severely dilutive to discourage excess risk taking by shareholders. von Furstenberg (2011, pp. 5-6) cites 5 prominent academics and two regulatory or advisory bodies approving contingent capital that would impose a punishing dilution on pre-existing shareholders. These would be well advised to keep clear of the conversion trigger on pain of facing the prospect of "death by dilution".

The problem with the recommendation of using cocos as a bogeyman is its inapplicability. For if conversion were to impose severe losses on pre-existing shareholders when triggered and perhaps even jeopardize their control of the bank, these shareholders could be expected to lean on management not to issue such a dangerous instrument in the first place.

c An IMF Staff Discussion Note (2011), even argued that *all* stakeholders should have to face losses from coco conversion to make such an event fearsome for both shareholders and coco-bond holders alike. Of course developments leading up to conversion, such as a string of operating losses reducing capital ratios toward the trigger level, may very well harm all stakeholders. However, conversion, first as a consequence and then as a partial remedy of decapitalization, cannot logically be a calamity for all investor groups. The reason is that conversion by itself is a redistributive activity that restructures the liability side of a bank's balance sheet without affecting the book value of its total assets. Hence what coco holders lose from cancellation of their debt claim net of the market value of the shares received in conversion, pre-existing shareholders must gain, and *vice versa*, under the rigor of balance-sheet accounting.

d Cocos are regularly described in literature designed to introduce them as being the most junior subordinated debt instrument on the balance sheet and hence the riskiest debt issued by banks. This is one of several unwarranted generalizations of what happens when a capital adequacy trigger event occurs. There can be more value and liquidity in the shares obtained in conversion than may ultimately be realized on the most junior non-coco debt. Cocos may jump the queue of subordinated debt by order of seniority particularly if the trigger on them is set at a Common Equity Tier 1 (CET1) capital ratio of 7% or more of risk-weighted assets. Such a high trigger level befits *recovery* cocos which are intended to restore a bank's viability outside bankruptcy in contrast to *resolution* cocos which trigger at lower capital ratios when the bank is no longer a going concern. Recovery cocos would convert automatically when triggered on their own terms and well before a bank could be facing non-viability and find itself prevented from paying interest on cocos for lack of distributable funds. They would thus not be involved in any, now contractually recognized, bail-in for unsecured debt or subject to the write-down and conversion powers spelled out in regulators' Bank Recovery and Resolution Directives for banks in distress.

What cocos are worth also depends on the ratio of the share price at conversion to the conversion price. If the two prices are equal, either coincidentally or because they are specified to be equal in a coco charter, automatic conversion into common shares due to a capital ratio event would restore the full value of the principal being cancelled at conversion to coco holders. In actual applications, a minimum is set on the conversion price to serve as circuit breaker. A downward spiral might otherwise develop when the conversion price is left open at the time of issue and linked to the shrinking market price of a bank's common stock as it approaches conversion. Where that market price may be expected to settle when the triggering of cocos appears imminent is difficult to predict. However, it will be shown later that setting the conversion price equal to the market price per share of common around the time of issue would make the market price expected at conversion equal to it because conversion by itself would then not cause it to change. Individual stock futures implicitly price the changing conversion risk for pre-existing shareholders in banks with cocos. Recent research by Westerholm and Ahmed (2016, p. 4) suggests that such futures may be leading price discovery for stocks. They caution, however that "individual stock futures have been successful only in a few markets".

e Valid generalizations are difficult to come by because conversion affects pre-existing shareholders differently for each type of cocos. Cocos may convert into the number of shares predetermined by the ratio of their principal balance to the conversion price or they may be write-down-only cocos, -- possibly followed by write-up if the competent regulator allows, -- that convert into nothing at all. These types of cocos have strayed far from their original design and may introduce regulatory uncertainty and debt overhang into their actual operation. They may also invite excessive risk taking as all the gains from the "conversion" of write-down cocos, i.e., from debt cancellation only, are set to go to pre-existing shareholders. The former coco holders go out empty unless the write-up feature contained in some of the cocos retains some value. For the cocos that are truly convertible into common stock, the ratio of the share price

at the time of conversion to the conversion price, which is often set already set at the time of issue, determines the distribution of gains and losses between pre-existing shareholders and the new shareholders by conversion.

Cocos of this type, on which we focus in this paper, were pioneered in 2009 by Lloyds Banking Group (LBG). A numerical example may help to show with recent data how conversion could then have played out. The conversion price had been set equal to the transaction-weighted average of prices of common observed on the London Stock Exchange over 5 consecutive trading days in mid-November 2009, around the issue date. The initial conversion price of 89.7246 pence (p) was adjusted already before the end of November 2009 to 59.2093p to offset the dilution from a massive rights issue. LLOY.L shares closed at 72.15 p on June 23, 2016 and opened at 51.00 on June 24 after release of the outcome of the Brexit vote. If cocos had been converted and the shares received sold at the close of June 23, coco holders would have recovered 122% of the principal of their claim. Pre-existing shareholders would lose from this compensation in excess of 100%. If all this had occurred at the opening on June 24 instead, the recovery rate of coco holders on their claim would have been only 86%, and pre-existing shareholders would profit. As the likelihood of conversion grows, cocos would of course be priced more like equity and less like illiquid debt.

f It is often asserted that it would be reasonable to expect that the equity received in conversion would be worth very little so that conversion might not be worth the bother. Since the circumstances that led to triggering of cocos are bound to have been dire for individual banks, a depressed stock price for their common shares is a reasonable expectation. However that does not mean that coco holders need to be adversely affected in all cases. For if the conversion price had not been fixed beforehand but set as a fraction or multiple of the market price per share of common stock actually prevailing after the notice of conversion, the expected recovery or replacement rate for coco holders would be equal simply to the inverse of that fraction or multiple and independent of the price of the common stock at the time of conversion.

g Finance professionals like to describe cocos as a niche product. It is difficult to argue with this characterization if it means that cocos will have only limited appeal for current and prospective investors and hence potential issuers. Moody's Investor Service (2016) reported that by the end of 2015 banks had issued $288bn of cocos in various currencies since the asset class first appeared in 2009. According to the same source, Additional Tier 1 (AT1) cocos, mostly subject to conversion with mechanical triggers, accounted for 76% of global issuance in 2015 while 24%, being less equity-like, were classified as Tier 2 (T2). Since 2015, under Basel III, cocos may meet up to one-quarter of the Tier 1 (T1) capital requirement totaling 6% of Risk Weighted Assets (RWA), with the remainder met by Common Equity Tier 1 (CET1). The contribution T2 cocos may make to the *total* regulatory capital requirement is capped at 2% of RWA. With one exception for Bank of Cyprus cocos, whose conversion saga has been described in von Furstenberg (2015, pp. 130-135), none of these instruments has as yet been converted into common equity in a crisis.

Cocos have however been purchased with government funds from distressed banks in some countries, notably Ireland and Spain, to shore up their troubled banks. This shows that exceptions were taken by governments that disrespected the most basic rationale for cocos. That rationale is to make systemically important banks, in particular, provision themselves more adequately by their own means rather than relying on Too Big to Fail (TBTF) subsidies to bail them out when needed. So even though not all cocos have lived-up to their intended use, their share of the T1/RWA, and the total, (T1 + T2)/RWA), capital ratios are destined to grow in coming years as subordinated debt that no longer qualifies for these ratios is replaced by cocos that do. Cocos, now especially those that qualify as AT1, are therefore woven deeply into the regulatory structure under Basel III and dismissing them as a niche product does not do them justice in this regard.

Choosing the most incentive-compatible distribution of expected gains and losses from conversion then is a major design issue in setting their terms, particularly the conversion price. Unless pre-existing shareholders stand to gain something from having cocos on the balance sheet, cocos will not be issued without regulatory mandates to do so, as in Switzerland. Such mandates obviate the market tests that are indispensable to establish and improve any

financial-market product until it can ultimately be successful on its own. On the other hand, if pre-existing shareholders stand to gain too much, as from the "conversion" of write-down-only cocos, they have insufficient incentives to mind the risks.

3 Cocos Conversion: Cui bono?

3.1 The Algebra of Dilution, and Its Opposite, for Pre-existing Shareholders

To answer the question of which stakeholders benefit or lose from conversion rigorously, the following variable names and relations will be used:

C Face Value of Cocos
CP Conversion Price of Cocos
E Book Value of Equity
MP Market price per share inferred from the book value of equity per share
N Number of Common Shares
W Wealth of coco holders (sub. cocos) or pre-existing shareholders (sub. pre) in the bank
Subscript $_0$ indicates status prior to conversion.
Subscript $_1$ indicates data post-conversion.
d is the change operator from $_0$ to $_1$.
$E_1 = E_0 + C_0$ because the coco debt is permanently cancelled at conversion so that $C_1 = 0$.
$N_1 = N_0 + C_0/CP$ because the number of shares issued in conversion of all cocos is C_0/CP.

By the quotient rule, the change in the book value per common share, $d(E_0/N_0)$, is:

$$d(E_0/N_0) = (E_0/N_0)[(dE/E_0)-(dN/N_0)] = (E_0/N_0)\,[(C_0/E_0-(C_0/CP)/N_0]$$

since $dE=C_0$ and $dN= C_0/CP$

The measure of the rate of dilution that may indicate dilution (−) or its opposite (+) then is:

$$d\left(E_0/N_0\right)/\left(E_0/N_0\right) = \left(dE/E_0\right)-\left(dN/N_0\right) = \left[\left(C_0/E_0-\left(C_0/CP\right)/N_0\right]\right. \quad (1)$$

The conversion price, CP, now determines the rate of dilution or anti-dilution (accretion). Equation (1) shows that conversion leads to dilution of the equity of pre-existing shareholders only if the original book value per share, $MP_0 = E_0/N_0$, is greater than the conversion price, CP. If $E_0/N_0 = CP$, what equity is gained from debt cancellation is lost to the new shareholders by conversion. The latter in turn are compensated 100% for the cancellation of their coco debt claim. If $E_0/N_0 < CP$, conversion is anti-dilutive (accretive) for the original shareholders while coco holders get fewer shares than would leave them fully compensated.

It is of more than academic interest to extend this discussion to extreme values of CP. At the lower limit, if CP is zero, the new shareholders from conversion would come to own the entire company as pre-existing shareholders would be expropriated through extreme dilution of their stake. If, on the other hand, CP rises above E_0/N_0, the result is anti-dilutive as fewer and fewer shares are issued in conversion. With write-down-only cocos, which actually do not convert into anything, CP has reached its other extreme. For them it is as if CP were infinity because the number of shares issued in conversion would be at the lower limit of zero. As equation (1) shows, the rate of accretion would then be C_0/E_0, being determined by the size, relative to E_0, of the face value of the cocos outstanding.

3.2 Patterns of Redistribution at Conversion

To determine how the value of the claims of coco holders and pre-existing shareholders change at conversion, and how the results depend on the size of the contractual variable CP relative to MP_0, the changes in their wealth, dW_{cocos} and dW_{pre}, are derived next. Conversion adds C_0 to pre-existing equity and C_0/CP to the total number of shares outstanding. Still anchoring this discussion by assuming that book value per share equals its market value yields the market prices per share of common before and after conversion:

$$MP_0 = E_0/N_0 \quad (2)$$

$$MP_1 = \left[E_0 + C_0\right] / \left[N_0 + \left(C_0/CP\right)\right] \quad (3)$$

At conversion the value of the claims of (the former) coco holders changes from C_0 to (C_0/CP) MP_1 so that the change in their wealth is:

$$dW_{cocos} = \left(C_0 / CP\right) - MP_1\ C_0 = \left[\left(MP_1 / CP\right) - 1\right]\ C_0 \tag{4}$$

This shows that cocos holders do not necessarily lose on balance considering the net effects of cancellation of their debt claim and the common shares received upon conversion. Rather, their wealth shrinks only if CP > MP_1, i.e., if conversion is on terms that are anti-dilutive for existing shareholders whose ranks they are about to join.

Turning to these pre-existing shareholders, their wealth is changed by the gain in equity from cancellation of the coco debt and affected by the change in in the share price MP that results from that increase in equity compared with the increase in the total number of shares outstanding.

$$dW_{pre} = \left(MP_1 - MP_0\right)\ N_0 = N_0\left[\left(E_0 + C_0\right) / \left(N_0 + \left(C_0 / CP\right)\right)\right] - E_0 \tag{5}$$

Adding the effects of conversion on the wealth of both coco holders, in equation (4), and pre-existing shareholders, in equation (5), now shows that the net effect on their wealth is zero.

$$\begin{aligned} dW_{cocos} + dW_{pre} &= \left[\left(MP_1 / CP\right) - 1\right]C_0 + \left(MP_1 - MP_0\right)\ N_0 \\ &= \left[\left(C_0 / CP\right) + N_0\right]MP_1 - \left(C_0 + E_0\right) = C_0 + E_0 - \left(C_0 + E_0\right) = 0 \end{aligned} \tag{6}$$

This can be verified by substituting for MP0 from equation (2) and then for MP1 from equation (3) in solving equation (6) above. Although the conversion of cocos could help with saving a bank from bankruptcy resolution and restoring confidence in its survival, conversion is not wealth creating per se for coco holders and pre-existing shareholders combined. Instead it is redistributive: What coco holders lose, is precisely what pre-existing stockholders gain in this accounting, and vice versa.

4 A Numerical Example

4.1 The Base Case as a Dividing Line

A numerical example may help underscore the importance of the last point for a correct understanding of the consequences of conversion.

Let the equity in a bank prior to conversion be $E_0 = 100$. With the number of shares being $N_0 = 50$, the inferred market price per share, MP_0, is $E_0/N_0 = 100/50 = 2$. There are cocos in a face amount of $C_0 = 12$ outstanding with a conversion price of CP = 3 in the base case. Hence C_0/CP = 4 shares would be issued to the cocos holders in conversion. The market price and book value per share after conversion would then be $MP_1 = (100+12)/(50+4) = 2.074074$.

Because CP > MP_0, cocos conversion is anti-dilutive and we would expect cocos holders to lose and pre-existing shareholders to gain. Solving equations (3) and (4) with the values given yields $dW_{cocos} = -3.7037$. Hence cocos conversion would have provided a replacement rate for the cancelled cocos of $8.2963/12 = 69\%$. As expected, dW_{pre} then equals 3.7037 and pre-existing shareholders gain more from the cocos debt cancellation than they lose on account of the increase in the number of shares outstanding. Rather than facing the prospect of being punished and seeing their stake diluted at conversion, as often advocated, pre-existing shareholders should thus welcome the issuance of cocos,

To show the crucial role played by setting the value of CP in the prospectus for cocos, CP is first lowered from 3 to 2, thereby pulling MP_1 down to $112/56 = 2$ also. This "neutral" or "fair" case is of particular interest because it implies that neither coco holders nor pre-existing shareholders suffer a net loss of wealth from conversion. Instead coco holders are fully compensated by the shares received through conversion while pre-existing shareholders see no change in the value of their portfolio. The reason is that in the base case where CP is set equal to the MP_0 that prevails around the time the cocos are issued, the equality $MP_1 = MP_0$ must hold also. The result means that, in the base case, conversion by itself does not change the future share price expected after conversion from what it was at the time of issue. This can be demonstrated by substituting E_0/N_0 for CP in equation (3) and simplifying to obtain $MP_1 = E_0/N_0 = MP_0$. The equalities show that equity per share does not change on account of coco conversion if CP is set equal to MP_0 in the cocos covenant as it was in the original Lloyds Banking Group issues of 2009. Rather, the number of shares outstanding would rise through conversion by the same percentage as equity is raised through the cancellation of the cocos debt.

4.2 On both Sides of the Divide

The base case represents a dividing line because when it is crossed the group that gains and the one that loses switch. Lowering CP from 2 to 1, so that 12 shares are received in cocos conversion, has crossed this line. MP_1 now becomes 112/62 = 1.80645 and dW_{cocos}= 9.67742 while dW_{pre} becomes -9.67742. Because CP of 1 is now far below MP_0 of 2, coco holders do very well. As the "A" part of Table 1 shows, they stand to retrieve 21.6774/12, that is, 180.06% as much from the 12 shares issued in conversion as the 12 currency units they lose from the cancellation of their debt claim. Pre-existing shareholders accordingly suffer a matching net loss of -9.6774. They lose almost 10% of the value of their 50 shares prior to conversion as this value falls from $E_0 = 100$ to 90.32, in the "B" part of Table 1.

Table 1. How cocos conversion changes the wealth of coco holders and pre-existing shareholders *depending on Conversion Price CP, given $MP_0 = 2$ and $C_0 = 12$*

1.A: (Former) coco holders obtaining common shares at conversion					
Annotations	CP	number of shares from conversion	MP_1 from equation (3)	product of previous two columns	minus cancellation of 12 in coco claims ($-C_0$)
CP>MP_0	3	4	2.074074	8.2963	−3.7037
CP=MP_0	2	6	2	12	0
CP<MP_0	1	12	1.806452	21.6774	9.6774
1.B: Pre-existing shareholders subject to share revaluation					
	CP	number of shares owned	MP_1 from equation (3)	product of previous two columns	minus starting value of 100 ($-E_0$)
MP_0<MP_1accretive	3	50	2.074074	103.7037	3.7037
MP_0=MP_1 neutral	2	50	2	100	0
MP_0>MP_1 dilutive	1	50	1.806452	90.3226	−9.6774

Any cocos issued with a conversion price that is appreciably below the market price expected to prevail after (the announcement of) conversion should thus find an eager market among bondholders. Pre-existing shareholders, however, may well seek to prevent their bank from issuing cocos that would have such dire implications for them when converted. Bank managers considering the issuance of cocos in turn might have to think better of it as their shareholders may well balk at their stake becoming subject to severe dilution should these cocos ever have to be converted into common shares. Hence issuing cocos on terms that have this implication is likely to be least feasible in practice.

The dual objectives to be met are therefore (1) to make the issuance of "recovery" cocos attractive for equity investors in financial institutions and (2) not causing potentially catastrophic losses for coco holders and their counterparties in the event of conversion. Table 1 shows that both objectives can be achieved if CP is set clearly above MP_0 but not more than 50% higher. That would leave the outcome in the accretive range for pre-existing shareholders who could expect a boost of no more than 3.7% in the value of their initial stake of 100, while coco holders would face a maximum expected loss of no more than 31% from their investment of 12. This prospective loss is half of the 60% loss generally attributed to default resolution of junior subordinated debt. Such debt is typically assigned an expected recovery rate of 40%. Issuer-friendly cocos with a CP in the recommended range can credibly offer a higher replacement rate at conversion. This shows that they need not be in effect the most junior debt they are often reputed to be.

Regardless of whether these recommendations are accepted as a reasonable compromise between conflicting interests it deserves to be noted that Ioannides and Skinner (2012, p. 83) were among the first to draw attention to the role of the conversion price in shaping the conflict of interest between the two parties. They note that if the conversion price is set too high (meaning: too far above the market price per share of common prevailing at conversion), 'stockholders can actually benefit ex post by expropriating wealth from the CoCo holders so stockholders can have the incentive to force conversion'. Berg and Kaserer (2015) have gone further and demonstrated first that CoCo bonds can magnify equity holders' incentives to increase the riskiness of assets and secondly that almost all existing CoCo bonds

would effect a transfer of wealth from CoCo holders to equity holders at conversion. They argued against such transfers and explained why they should be reversed: '[A] conversion price that induces some wealth transfer from equity holders to CoCo bond holders [rather than the other way round] could help to mitigate risk-shifting incentives already present in the current capital structure of banks. It could therefore help to mitigate … substitution [of riskier assets] and debt overhang problems [discouraging the raising of new equity]' (Berg and Kaserer, 2015, p. 33). The authors mentioned in this paragraph do not explain why pre-existing shareholders would not prevent management from issuing cocos that would make them lose, and coco holders gain, if it came to conversion.

The fear of existing shareholders precipitating conversion or raising the likelihood of conversion by taking on more risk may be counterbalanced by the fear of regulators and the CFOs of banks to avoid blame for having caused a creditor run through premature or opportunistic conversion of cocos. In fact, 'governmental systems for setting and enforcing financial rules are infested with incentive conflicts' (Kane, 2016, p. 13). These often lead to paralysis and dereliction for fear that official interventions could reveal and spread adverse information. Deutsche Bank's February 2016 decision to buy back over $5 billion in euro- and dollar-denominated senior unsecured bonds with regulators' implicit blessing is a case in point. This action was taken by the bank to reassure markets of its financial strength rather than having its cocos convert under a regulatory-event trigger. The episode showed to what contortions "fear of conversion" can drive a major bank. With the one exception mentioned earlier, no cocos conversions have in fact yet occurred. Even if an opportunistic conversion could in fact be carried out over the objections of regulators, the bank that issued the cocos that brought inexcusable loss to their holders would be punished severely. It would suffer litigation and reputational costs and downgrades that might well impinge on its funding market and preclude the replacement of cocos anytime soon. Excessive risk taking through reliance on cocos conversions to equity so far does not appear to have been a problem since hardly any such conversions have as yet occurred. However, the spreading use of write-down only cocos could become a problem once conversions set in during a future financial crisis.

4.3 Trigger Levels Matter Also

Thus far the focus has been on CP as a crucial tool for managing the distribution of gains and losses and hence incentives for the principal groups of stakeholders in a bank with cocos. The management of the trigger levels of these instruments still remains to be considered. Under Basel III, 'the home country supervisor of an internationally active bank would have the authority to trigger a write-off or a conversion of non-common Tier 1 and Tier 2 instruments issued by the bank' (Ioannides and Skinner, 2012, pp. 79-80). Regulators are thus able to declare a non-viability event that causes cocos to be triggered at their own discretion. Use of this trigger based on regulatory judgment should be considered only in extreme cases, such as in instances of accounting fraud by the bank, or it will infringe upon the automaticity of conversion most suitable for high-trigger cocos. Conversion due to a capital event will have no signaling value over and above what is already revealed by the decline in the well-publicized capital ratios that set off the trigger. This openness and keeping CT fixed and uninfluenced by events help prevent death spirals.

Cocos can be readily marketable and the conversion risk and its consequences can be calculable only if conversion is sure to be triggered without interference or the need for permission from regulators. Hence the Basel III capital-ratio triggers put on cocos should be high enough to make sure that they are the first of several possible triggers to be reached. For this the trigger should be set at issuance one to three percentage points above the minimum CET1 level that is required to prevail, looking forward, by the next call date. At that and subsequent call dates, which usually recur every five years, the minimum capital-ratio requirement, and hence the trigger level, could be reset. Concretely, the minimum CET1 requirement in effect is 5.125% for 2016 and 7.0% for 2019 and thereafter, as so far determined. The leverage ratio, dispensing with controversial risk weighting of assets, should also be updated periodically if it should be used as a supplementary trigger as might be commendable.

5 Properties and Conclusions

Articles in financial journals and press still reveal some confusion over contingent convertible debt

securities that actually convert to common stock when triggered and on the consequences of their conversion for two groups of investors. These are (i) pre-existing shareholders of the bank and (ii) coco holders who become the owners of newly issued shares of common at conversion. Setting intangible effects of conversion aside in balance-sheet accounting brings out the crucial role played by the level of CP in allocating the zero-sum gains and losses to the two parties. If the conversion price that is set at the time the cocos are issued is higher than the share price observed after notice of conversion has been given, so that CP>MP, the former coco holders stand to lose more from the cancellation of their debt claim than they stand to gain from the shares issued to them in conversion. Their net loss is pre-existing shareholders' net gain. For the latter the increase in equity stemming from the cancellation of the coco debt is worth more than the loss from the increase in the number of shares outstanding due to conversion.

Having shown that changes in CP redistribute gains and losses between the original stock and cocos-bond holders, the question arises what the most efficient level of CP would be relative to MP. The writers cited on this question earlier would like to see a transfer of wealth from pre-existing shareholders to (the former) coco holders at conversion to discourage shifting toward riskier assets and to make banks more willing to raise new equity in a crisis. This would require aiming for MP>CP. I have argued, however, that the reverse transfer, benefitting pre-existing shareholders of the bank as described in the earlier paragraph, may be necessary to make them accept the issuance of cocos in the first place.

Those who have recommended that pre-existing shareholders should be severely punished at conversion must confront this reality unless they are prepared to call for the imposition of cocos mandates by regulators. If the transfer to pre-existing shareholders is sufficiently modest, it could still leave a replacement rate for the coco holders that are well above the 40% generally assumed on junior subordinated debt. Furthermore, the risk of opportunistic conversions being encouraged by tilting the scales somewhat toward pre-existing shareholders is likely to be minor on account of reputational and funding concerns. This risk could even be nugatory in view of the fact that practically no conversions have as yet occurred, suggesting widespread fear of conversion by banks.

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Appendix:

Capital requirements met by cocos and the triggers for their conversion into equity

The "Basel III" regulatory capital requirements make reference to tier 1 (T1) and tier 2 (T2) capital in percent of risk weighted assets (RWA). T1 is paid-in and retained common equity or non-common and still equity-like capital. T2 securities are generally senior to T1 and less immediately loss-absorbing as they consist of subordinated debt and preference shares which may become loss-absorbing only when bankruptcy resolution is already impending rather than still avoidable. This T1 capital ratio is the sum of CET1, Common Equity T1 capital, the Capital Conservation Buffer, CCB, met by CET1, and AT1, Additional T1 capital, which may include cocos. T1 cocos may contribute no more than 1.5% to this percentage and T2 cocos may add up to 2% more to what is known as the total, rather than T1, capital ratio.

The denominator is risk-weighted assets (RWA) for the regulatory capital ratios. For the leverage ratio the denominator is total on-balance-sheet and off-balance-sheet "exposures" which are approximated by total assets (TA). By dispensing with the risk weighting, the leverage ratio serves as a backstop; for if the risk weights, RWA/TA, of banks were systematically understated in application, reported capital ratios would be overstated and could provide false comfort. Empirically RWA has tended to be between 0.15 and 0.35, and lower for European than for US banks.

By 2019, the minimum *T1* capital ratio will consist of core CET1 of at least 4.5% plus 2.5% more CET1 for the CCB, and at most 1.5% credit for AT1 for a combined minimum of 8.5%. The minimum *total*, T1 and T2, capital ratio is 2 percentage points higher; T2 cocos may get credit for up to 2% in the overall, fully loaded 2019 total of 10.5%. However, the conditions for T2 cocos to qualify for such credit or keeping it, through grandfathering, only until the next call date were tightened considerably in 2015. Conversion must occur under the terms of these instruments when the trigger levels referenced are reached or expected to fall short of their required level in the near future. National regulators may add a sporadic countercyclical buffer and a surcharge for individual Systemically Important Financial Institutions (SIFIs).

So far the numerator of the T1 leverage ratio is the same as that of the T1 capital ratio. The minimum leverage ratio that must be maintained by all banks is 3% but it is twice as high in the United States, at least for Insured Deposit Taking Institutions of Global Systemically Important Banks (G-SIBs), and 5% in Switzerland.

