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DSF Policy Paper Series

# Coco Design as a Risk Preventive Tool

*Mark Flannery and Enrico Perotti*

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## Coco Design as a Risk Preventive Tool

Mark Flannery and Enrico Perotti\*

The financial crisis saw local credit losses spread widely because bank capital was insufficient to cope with the accumulated credit risk, maturity mismatch and contingent liquidity risk. Ultimately, short-term liability holders lost faith in some large banks' ability to repay them. The resulting runs forced supervisors to step in with government support. Basel III rules now require higher equity ratios, though banks have been granted a very long time to comply. The financial industry has successfully argued that raising hundreds of billions in capital is at present too difficult.

Preceding these destructive runs was the banks' slow decline in asset values derived from poor underwriting and investment decisions. (At least we know now that they were "poor.") Supervisors did little to assure that banks had adequate economic capital to support their risks. Indeed, permitting shareholders to retain control of a bank even as its economic capital evaporates invites poor behavior. The shareholders have little to lose and much to gain from taking on new risks. Once supervisors permitted a bank's leverage to expand, even a small shock could elicit depositor runs, leaving governments with little choice by to provide financial support.

Now regulators are considering whether capital may be raised in the cheaper form of contingent capital. So called CoCo bonds do not share profits in good times, but automatically convert into equity to bear losses in bad times. While not a complete alternative to liquidity support and some state guarantees in systemic crises, they represent a form of private bail-in cushion for individual bank distress. Designing any new liability structure for large banks must countenance the likely incentive effects of that structure. A tempting, but incorrect, comparison is with dike construction: higher levees can contain more floods but at higher costs. However, flooding is an act of God, and will not change on account of the dikes' height. A more fruitful analogy is to mandatory seatbelt use: do people drive faster because they are buckled in? It is essential to understand that coco conversion terms not only determine risk bearing, but also change incentives to take risk.

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Critics of contingent capital claim that replacing some common equity with cocos would permit bank shareholders to avoid bearing their share of risk (Admati and Hellwig, 2010). The validity of this issue depends on the coco bonds' design. Design of CoCo bonds involves many specific details, starting with the amount of such bonds supervisors should require and the "terms of trade" between CoCos and traditional equity capital. However, three aspects of CoCo bonds will importantly affect the risk-taking incentives of bank shareholders: the share conversion ratio, the trigger ratio (high vs. low; going concern vs. gone concern), and how the trigger is measured (accounting vs. market-valued numbers, supervisory assessment).

In brief, a higher conversion ratio protects bondholders by transferring more "downside risk" to the initial shareholders. A higher trigger ensures a higher average amount of capital, probably at the cost of a higher coupon. Accounting values and (perhaps) supervisory assessments tend to lag reality when a bank is in trouble, but market assessments of firm value may also be incorrect, or manipulable for private gain.

We discuss here the incentive effect of these three design choices.

### **The timing of conversion**

The debate has focused on coco conversion as an end game, when equity is worthless. Although the first coco bonds (Rabobank, Lloyds Bank) convert only once book equity reaches a low (accounting) threshold, this is not a necessary feature. Setting a low trigger permits banks to postpone recapitalization longer. At low capital ratios, shareholders have too little at stake, and it becomes rational for them to seek riskier bets. Low capital also makes it more likely that depositors will lose confidence and run the bank, effectively forcing supervisors to support the institution.

Both theory and recent experiences suggest that highly levered shareholders are not the claimants with the best incentives for value preservation. They have limited capital at risk, the exact situation which led to very high bank equity returns and an orgy of risk taking up to 2008. So if coco bonds were to convert only at the point of bank failure, banks would operate longer at high leverage, where the ability to shift risk to lenders and public insurance increases their risk taking incentives. This is the situation we need to avoid. An early conversion ensures that control shifts in a timely fashion towards investors that can lose as well as gain from risk-taking.

A sensible solution is to have a partial early conversion at equity levels consistent with bank solvency. This notion is used in the pioneer proposal by the Swiss authorities, where a fraction

of CoCos would convert to equity while the bank remains clearly a going concern. (Critically, the bank would need to replenish the converted tranche within some date.)

Such early conversion (namely, a high trigger) can act as a preventive tool.

First, more risk is born by initial shareholders. Second, by decreasing leverage, it shares profits among more investors, which reduces their share of risk premia and thus their incentives to take riskier bets.<sup>1</sup>

Many problems arise when large financial firms are permitted to operate with inadequate capital. CoCo bonds with a high trigger value avoid those problems by maintaining equity capital at an adequate level.

### **Conversion terms**

The next critical issue for incentives and risk-bearing is the conversion price. If CoCos convert to equity, how many shares are provided for each converting bond? CoCo bondholders may be asked to suffer an immediate loss upon conversion, as for the Rabobank and (almost surely) for the Lloyds issues. But the bondholders' loss would be shareholders' gain!

If shareholders were protected against bad outcomes by a value transfer from CoCo bondholders, their incentives to limit risk would be compromised.

It is much preferable to convert a bond into an equal value of shares, given their contemporaneous market price. This would provide CoCo investors with a very safe claim while the bank's initial shareholders would suffer greater dilution at conversion, sharpening ex ante shareholder incentives to contain risk. Par conversion would also limit share price jumps, thus reducing the incentive to manipulate CoCo bond prices and enhance their liquidity. Second, it would lower CoCo bond coupon rates and broaden the set of investors willing to hold CoCos.

A larger increase in outstanding shares implies a larger dilution, as profits are shared among more investors, and less risk is shifted to bank lenders. In nonfinancial corporations, dilution implies no loss of equity value when shares are issued at a fair price, and when debt is riskless. In the case of banks, it reduces reliance on subsidized debt, as most bank debt is directly or indirectly insured. As a result, the rate of return on bank shares is highest when leverage is maximized (which is why financial intermediaries have mandatory equity ratios, unlike other firms !)

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<sup>1</sup> It may also achieve an early switch of control rights from old to new equity holders who were former lenders, and may favor more conservative investment decisions.

As a result, conversion at par ensures maximum dilution. The advantage is a sharper deleveraging and a greater improvement in risk incentives. A larger dilution also would induce bankers to avoid conversion, thus giving them a new incentive to maintain a high capital ratio.

### **Conversion trigger: market prices versus regulated indices**

This is the most important feature of CoCos – and also the most controversial. From an efficiency point of view, the best trigger should be based on the most precise indicator of potential financial distress (provided there are no external effects).

### **Are market prices informative ?**

Market prices have proved to be poor predictors of aggregate risk: share prices of financial institutions climbed as credit risk built up in the system, reaching a maximum in mid 2007. While there was probably a behavioral component (e.g. collective overconfidence), poor incentives were also caused by implicit public guarantees. In a major crisis, many losses are shifted to public guarantees, while liquidity risk is resolved by central banks. As a result, tail risk is not priced in private securities, although bank investors earn the associated risk premia if things go well. The de facto insurance of bank liabilities creates a distortion, boosting share prices especially when effective leverage is high.

Market prices in the last years followed a cycle of exuberant mood turning rapidly into panic, leading to diffused skepticism on their ability to signal financial risk.<sup>2</sup> As a result, most bankers and regulators resist any market trigger to guide coco conversion. The Swiss proposals would rely on conversion once the book value of equity falls below a certain minimum level. An accounting trigger is less volatile than a market trigger, which is why regulators are more comfortable with it.

Yet they should not be.

It is true that market prices, in particular bank share prices, failed to signal the risk build up. But here it is essential to understand why that was the case.

Under Basel II, banks had every incentive to seek to operate at maximum leverage, and in fact they did precisely that. A bank which took more risk enjoyed greater risk premia, while hardly paying a higher funding cost. This was by no means irrational: the credit expansion was funded largely by increasing wholesale funding, which could rapidly escape before default, not least because of liquidity support from the central banks. Even subordinated debt escaped without

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<sup>2</sup> Although market prices provided little indication of rising aggregate risk before the crises, by 2007 they did contain information on relative risk (Acharya e.a. 2010). In general, markets are better at relative than absolute risk evaluation.

bearing any loss, since practically no bank was allowed to go bust. In such a situation, it was perfectly rational for markets to price highly the shares of banks maximizing their risk exposure, as shown by Lehman's all time high one year before collapse.

### **Death spirals**

Does conversion create a discontinuity ? It is argued that a market trigger may lead to a rapid fall in the equity price as it approaches the trigger point. This is indeed likely, but it is not a distortion. The flaw in the old system was that banks were able to keep operating at a level of leverage such that most losses would be borne by someone other than shareholders. In fact, because effective leverage increases with asset value declines, the rate of return per unit of equity increased linearly (since insured debt was not repriced). This is the real distortion.

Early coco conversion (at par value) corrects this distortion. It involves a dilution of current equity, which will be anticipated. It will thus accelerate price declines once market capitalization becomes weaker. This reflects the correction to the real distortion, that the more leveraged is equity, the higher is its return. Conversion causes a healthy drop in equity return because it reduces excessive leverage and thus risk shifting, restoring proper incentives. So any dilution suffered by shareholders is more than compensated by a social gain, as it reduces excessive risk incentives exactly when they are becoming excessive. A properly set trigger can thus minimize risk shifting.

Critically, introducing a serious risk of early dilution would alter the structure of incentives radically. Once conversion is triggered at a moderate level of leverage, shareholders have to share profits with many more investors, and bear more of the losses. This creates a negative effect of risk taking for initial shareholders, and risk management would become a serious concern. Moreover, since an increased risk of conversion would depress share prices, there would be finally an incentives for market investors to track and price bank risk. For that very reason, market prices would become more informative.

A market trigger is the easiest for markets to price, and the only type of trigger that permits proper risk management for investors. It would enhance liquidity of coco bonds and simplify the hedging of these securities.

A concern for market triggers would be excessive conversions under high share price volatility. By itself, this would correct a structural tendency by regulators and bankers to err on the side of undercapitalization. Still, to take into account regulatory misgivings about excess market

volatility, the trigger could possibly be based on average market share prices over multiple days.

### **The risk of panic upon conversion**

Clearly, a conversion consolidates solvency, but may cause market fears over other banks. An advantage of early conversion (that is, when share prices are not yet too low) with a market trigger is that conversion would occur at a reliably high level of market equity value, thus avoiding runs. Furthermore, equity conversions could be effected in relatively small chunks (within a large, thick tranche of CoCo bonds), which would minimize value transfers and hence the potential for share price manipulation.

### **Regulatory trigger**

Although regulatory discretion is best avoided in going-concern CoCo conversion, it has a natural central role to play at final stages of distress, when bank equity is a way-out-of-the-money option play. At such low bank equity level, even imminent conversion will not dissuade risk taking (since the dilution on the upside is overwhelmed by the degree of risk shifting).

Regulatory discretion should thus rule the late stage conversion stage and the bail-in process.

Coco conversion triggered by accounting numbers would be subject to regulatory discretion, so the key risk will remain regulatory-based – as it has been in the past. Given the long tradition of regulatory forbearance in banking, excess delay is a virtual certainty. And once bank risk passes some threshold, regulators are likely to be caught in a situation where they would hardly dare to allow accounting values to recognize the estimated losses, lest a massive panic break out. In this sense, the automatic nature of market price conversion would be a serious commitment device for regulators under lobbying or political pressure to delay intervention.

Accounting values are naturally a lagging indicator of risk, since losses take time to reveal themselves, and bankers have all interest in postponing their recognition. For large banks, major accounting issues are to a large extent at the discretion of regulators. Bank history suggests that this choice would enable shareholders to keep gambling too long.

## **Conclusions**

We propose a market-triggered coco buffer at high threshold values to maintain risk incentives as effective leverage increases, overcoming the risk of regulatory delay. We argue this will also activate risk information discovery by market prices of bank securities, and increase activism by outside shareholders.

The benefits will be:

- Higher average level of equity capital than in the case of terminal CoCos (which simply take losses in default states)
- A rise in equity risk bearing precisely when risk incentives become much distorted.
- Automatic recapitalization of the bank as a going concern, at a stage of distress when equity issues would be quite difficult.
- An incentive for market participants to monitor early signals of distress, allowing market price to play some discovery role
- There are drawbacks. Market prices may at times be irrational, forcing equity conversions which are unnecessary. Yet the problem historically has been too low equity buffers, so some type-I errors may even be welcome.
- Early conversion may increase equity volatility around the trigger. However we have shown that this represents a correction of an underlying distortion (induced by publicly insured bank debt). The conversion feature would actually reduce share volatility overall, as it reduces risk incentives and ensures a higher average amount of capital, especially in bad times.

