



cutting through complexity

ADVISORY

Incentive effects of contingent capital 2013

kpmg.com

KPMG INTERNATIONAL

GVI *Global Valuation Institute*

Foreword

KPMG's Global Valuation Institute ('GVI') is thrilled to introduce its fourth managerial paper since the launch of its research agenda. Following the first three papers covering a range of subjects including employee stock options and restricted stocks, profitability and royalty rates across industries and financial reporting valuation practices across both sides of the Atlantic, this fourth paper on contingent convertible bonds in the banking sector further illustrates the depth and diversity of KPMG's GVI research agenda.

We recognize that valuation is a constantly evolving discipline that has been shaped by practical and theoretical advances. Many high quality research papers on valuation subjects never find their way to the public domain with an opportunity to influence the evolution of standards and practice because of a lack of exposure to practitioners.

Our goal is to act as a catalyst for the public dissemination of breakthrough valuation research. To this end, KPMG's GVI benefits from the expertise of an Academic Advisory Board comprising professors from Beijing University in China, Northwestern University in the US and Oxford University in the UK.

This Board designs a research agenda and selects and reviews the sponsored research.

We work closely with researchers to present their managerial papers in a format that is understandable to a broad range of business professionals. This includes illustrative papers with applications and/or case studies. Through this process, we keep KPMG's global network of 1,200 valuation professionals informed of emerging valuation issues.

This managerial paper 'Incentive effects of contingent capital' is authored by Charles P. Himmelberg and Sergey Tsyplakov. Charles is head of Global Credit Strategy at Goldman Sachs & Co. He has an impressive research background and comes with a practical sense of business issues. Prior to joining Goldman Sachs, Charles held several positions at the Federal Reserve and at the World Bank. Sergey is an Associate Professor in the Finance Department of the Moore School of Business from University of South Carolina.

We believe that their work makes an important contribution to the emergent subject of Contingent Convertible bonds (CoCos) and sheds light into

its corporate finance implications for banks and regulators.

The authors start by providing context to CoCos as one of the responses to the Basel III reforms to strengthen regulatory capital requirements for systemically important financial institutions (SIFIs). They explain how CoCos, if adequately designed, can create incentives for banks to pursue conservative capital structures and the critical role of the conversion ratio to achieve this objective. The authors further explain why many banks have not yet issued CoCos with dilutive conversion terms. They then analyze how "trigger uncertainty" can be avoided by the implementation of adequate trigger designs. Lastly, the authors explore the pitfalls of value-destroying incentives and their consequences during times of financial distress. Their model description is appended to this paper and reference is made to their full working research paper for those interested in analyzing this subject further.

The views and opinions expressed herein are those of the authors and do not necessarily represent the views and opinions of KPMG International and/or any KPMG member firm.



Yves Courtois
Partner
KPMG in Luxembourg



Doug McPhee
Partner
KPMG in the UK



Jean Florent Rerolle
Partner
KPMG in France

Abstract

Contingent Capital bonds – also known as contingent convertibles (or CoCos) – are bonds that automatically write-down or convert to equity when the financial health of the issuer (typically a bank) deteriorates to a pre-defined threshold or trigger. This paper discusses how the contractual terms of CoCos affect future capital structure incentives, and hence the pricing of such liabilities. The conversion ratio is particularly important. If conversion is dilutive for equity investors, we show that banks will actively seek to reduce expected dilution costs by pursuing low leverage ratios leading to lower borrowing costs. On the other hand, if conversion ratios write down bond principal without diluting shareholders, then banks have

perverse incentives to pursue higher leverage and capital destructive policies resulting in wider credit spreads. Finally, we show that despite the obvious private and social benefits of dilutive CoCos, banks may choose not to issue them ‘midstream’ since a large fraction of the benefits are captured by existing bondholders. These findings suggest that the contractual terms of CoCos – conversion ratios in particular – warrant more attention than they have received to date.

The views in this paper are those of the authors and do not necessarily reflect the views of Goldman Sachs. This is a short version of the working paper with the same title.

Introduction

Basel III proposed reforms to strengthen regulatory capital requirements for big systemically important banks. Stronger regulatory capital requirements include a combination of higher minimum Tier I and Tier II capital as well as loss-absorbing instruments such as contingent capital bonds. In particular, Basel III proposes that big banks could be required to hold contingent capital bonds in addition to the minimum regulatory capital standards. The Committee will permit banks to count such bonds toward regulatory capital requirements.

What are Contingent Capital bonds? Contingent Capital bonds — also sometimes known as contingent convertibles (or CoCos) are bonds that are automatically written-down or converted to equity when the issuer’s financial health deteriorates to a pre-determined threshold or trigger. The primary advantage of CoCos, which is well-known, is that CoCos can automatically recapitalize a bank when it is overleveraged and likely in distress, but still has significant enterprise value. When conversion is triggered, leverage is reduced, no new external

funds are raised from capital markets and no government funds are needed for bailouts. For this reason, CoCos are currently viewed as a potentially valuable tool for helping bank regulators address the ‘too big to fail’ problem (see the discussion in Flannery, 2009a, b).¹

¹ See also the discussion by Squam LakeWorking Group on Financial Regulation (2009) and Duffie (2009).

1.

Incentive advantages of CoCo

There is another important advantage of CoCos that is the focus of this managerial paper, but has been largely ignored by researchers and regulators: it is that CoCos can, if properly designed, create strong incentives for banks to pursue conservative capital structures. In order to understand these incentives, one important design feature of the contingent capital should be considered: The conversion ratio or the price at which the instrument would convert into common shares. Conversion ratio will determine whether at conversion, the holders of contingent capital bonds absorb losses or if the losses are incurred by existing shareholders of the bank. The higher the conversion ratio (i.e., the lower the stock price), the more shares that contingent capital holder will receive when conversion is triggered and the greater will be dilution of existing shareholders. In other words, if the conversion terms are set at a level such that holders of contingent capital receive common shares worth more than the par bond value, then the bank's existing shareholders would absorb economic losses at conversion.

If the conversion terms of the CoCo are dilutive for the pre-existing shareholders, then banks have an incentive to maintain a precautionary capital buffer (i.e., lower leverage). In response to negative capital shocks, banks would face greater risk of future dilution from forced conversion of the CoCo, and thus would have strong incentives to preempt this, for example, by raising new equity capital.²

These incentives of (dilutive) CoCos can mitigate the ex-post conflict of interest between shareholders and bondholders known as the 'debt overhang problem.' As is well-known, a bank financed with straight debt and managed on behalf of shareholders has no incentive to issue equity during financial distress. This is because the cost of dilution exceeds the benefit of lower financial distress with most of the benefits going to bondholders. Among other phenomena, this logic can explain why banks that are overlevered and vulnerable to distress are often reluctant to issue equity, and may help explain why bank managements often view equity as a relatively expensive form of external financing. The reason as to why contingent capital bonds can create these incentives is to recognize that the bank's future decisions to issue equity, recapitalize and move away from the conversion trigger, is driven by the trade-off between diluting equity, though equity issuance on the bank's terms, vs. accepting punitive terms dictated by the contingent capital contract. In this sense, a tranche of contingent capital bonds in the bank's capital structure acts like an ex-ante 'commitment mechanism' that provides the bank with incentives to maintain a more conservative leverage ratio.

The competing incentive effects of contingent capital and debt overhang can be quantified by using a pricing model that can price-in trades off the cost of issuing equity (and foregoing the equity benefit of debt overhang) against the cost of accepting the punitive

terms dictated by the CoCo contract. The model structure is outlined in Appendix 1. The model helps to answer questions such as "how dilutive do the conversion terms need to be in order to materially influence management incentives?" and "how large does the CoCo tranche need to be?" The model allows us to quantify (and price) the incentive effects of tranche size and conversion ratio by quantifying expected future changes in equity issuance, leverage, and default risk alongside the prices of common equity, contingent capital and senior debt.

For the base case calibration of the model, even a relatively small tranche of contingent capital bonds where conversion terms are dilutive to shareholders can go a long way toward mitigating the negative incentive effects of debt overhang. The model shows that managers acting on behalf of shareholders would issue new equity preemptively to move away from the trigger boundary to reduce the equity dilution costs associated with CoCo conversion. The material reductions in leverage, default risk and credit spreads can be created with tranche sizes that are a relatively small fraction of outstanding debt. For example, the model predicts that a CoCo tranche equal to 5 percent of assets, a conversion ratio of 8 percent above par and a trigger set at 6 percent capital results in a reduction of credit spreads by about one quarter. It also lowers default probability by about one third when compared to a similar CoCo with a conversion ratio set at par.

² The incentive consequences of contingent capital have also been commented on by Strongin, Hindlian, and Lawson (2009), Pitt, Hindlian, Lawson, and Himmelberg (2011), Berg and Kaserery (2011), and Calomiris and Henning (2011).

2.

Why have banks not yet issued bonds with dilutive conversion terms?

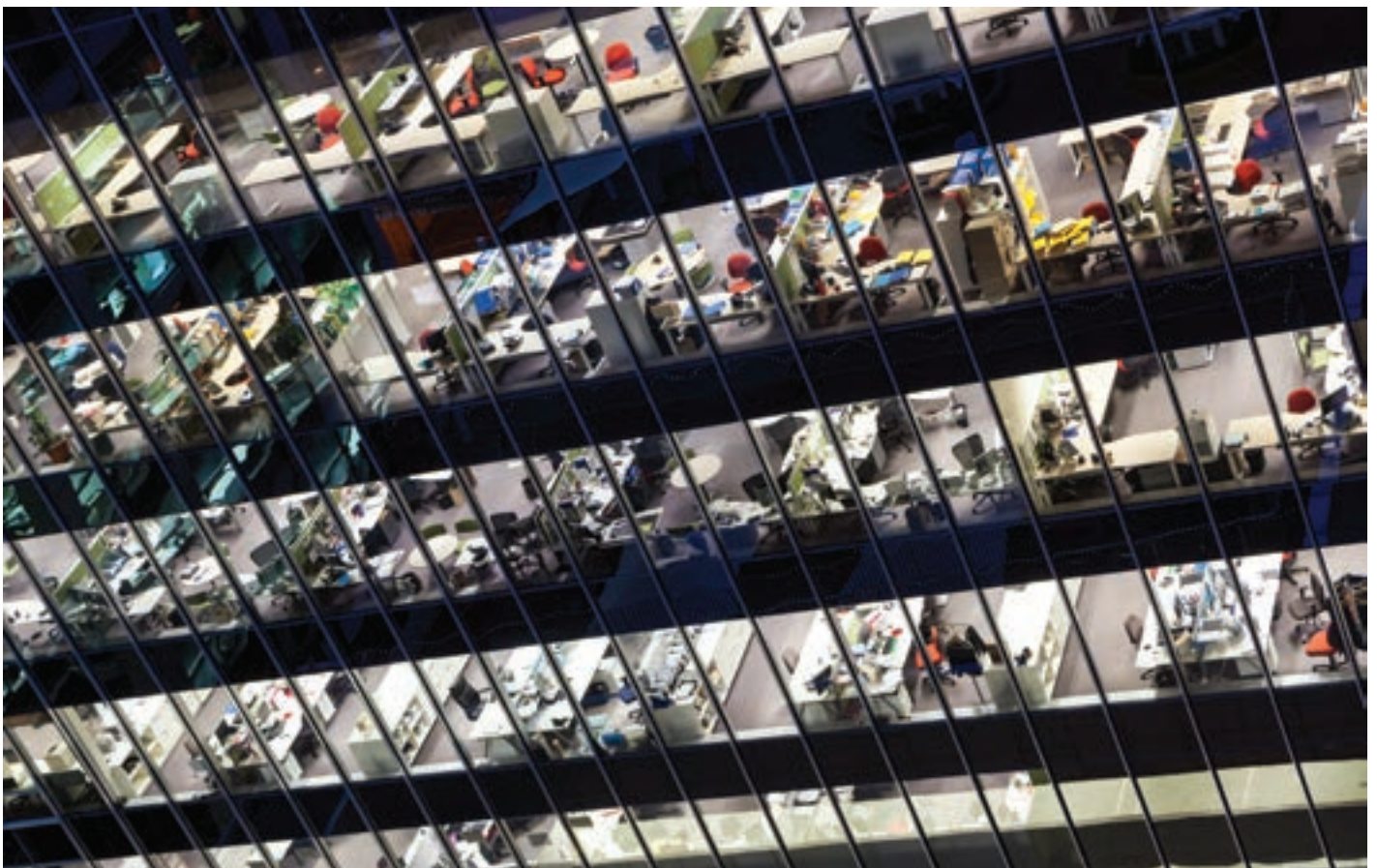
Appendix 2 briefly describes some of the 'loss absorbing' bonds issued by European banks during 2009-2012. For the majority of the bonds, the conversion terms assume writedown of bond principal when triggered and thus are dilutive for the bondholders. So far, there are no bonds in existence with conversion terms dilutive to the shareholders. Since such bonds can lower expected default losses and thus reduce the cost of both CoCo debt and senior debt at issuance, it is natural to explore why firms do not voluntarily choose to issue such CoCos. Part of the explanation may again be traced to ex-post conflicts of interest: If dilutive CoCos are issued mid-stream (i.e., when the bank already has senior debt) the value of committing to lower future leverage ratios flows mostly to the pre-existing debt rather than to the equity. As such, the contingent capital tranche will reduce the risk of existing debt and will create incremental value to debtholders at the shareholders'

expense, where more dilutive conversion terms could lead to a larger wealth transfer from shareholders to pre-existing debtholders.

Due to the possibility of wealth transfer, the bank will not have incentives to issue contingent capital bonds with dilutive conversion terms voluntarily when there is already a senior debt in its capital structure. The concerns of a possibility of wealth transfer are alleviated should the bank issue contingent capital debt at the same time it issues senior debt. If issued simultaneously, the bank's shareholders will benefit because the contingent capital debt will increase the value of the newly issued senior debt resulting in lower overall borrowing costs.

There is another important practical question: Once a bank's contingent capital bonds have been triggered, what can be done to enforce or encourage re-issuance? After the initial tranche of contingent capital has been triggered,

shareholder incentives are back in a world of 'debt-overhang,' and as argued above, shareholder incentives to issue contingent capital bonds 'midstream' are weak or non-existent because the subsequent benefits of conservative leverage flow disproportionately to existing bondholders. One suggestion might be to prohibit capital payouts as well as any issuance of long-term debt until a minimum level of contingent capital bonds has been re-issued. It is likely that incentives to issue equity could be increased if dividend payout restrictions are imposed following conversion of the contingent capital, because such restrictions reduce the equity option value of debt overhang. Thus, to extract the maximum incentive benefits of contingent capital bonds, bank regulation would need to mandate not just their initial issuance, but also their subsequent re-issuance, post-conversion.



3.

The effect of trigger design and trigger failure on value-creating incentives

Policymakers and researchers acknowledge that in order to avoid ‘trigger uncertainty,’ the trigger has to be based on accurate measures of capital that can adequately assess the true health of a bank or other system-wide measures of distress. ‘Trigger uncertainty’ (or ‘trigger ambiguity’) can be a function of trigger designs. What is important to understand is that any type of ‘trigger uncertainty’ will weaken the effect of incentive for banks to maintain a conservative debt size.

There are several proposals on different types of trigger designs, and some of which have already been implemented. The Basel III Committee proposes that a host country’s regulator could have authority to call a trigger event to write-off or convert contingent capital instruments. Regulators can choose to activate the trigger for a particular bank in order to help save the bank from insolvency and prevent a spillover on the entire financial sector. Some bonds listed in the Appendix 2, already have such regulatory-based trigger included in the contract. The prime drawback of such triggers could be that they are likely difficult to communicate to the markets as to when macroeconomic conditions reach a point that can justify regulatory intervention. This difficulty will likely create a risk of ‘trigger ambiguity,’ which can result in premature conversion. This ‘trigger ambiguity’ could increase risk for investors, which can potentially increase the initial cost of the contingent capital. This is because banks and investors cannot perfectly predict when regulators will decide to exercise this authority to trigger the conversion. This argument underscores the value of enhanced disclosure and transparency as mechanisms for increasing political scrutiny of regulators. There is another point: if the trigger is, in part, based on systemic or macroeconomic conditions, then a bank’s own actions cannot affect fully the likelihood of triggering. Therefore, a regulatory-based trigger maybe less effective in creating incentives for a bank to improve its risk management and maintain a

conservative leverage ratio, even if conversion dilutes equity.

The possibility of premature triggering can also arise in a number of other ways. For example, triggers based on market values of equity are often thought to be vulnerable to premature triggering due to market failures or strategic behavior of investors to manipulate bank stock prices. The risk of premature triggering could dampen incentives for banks to maintain conservative leverage strategy because it reduces the ability of the bank management to control risk of conversion.

Some trigger designs can be subject to delayed triggering. For example, triggers linked to accounting-based regulatory capital are likely to be insufficient to determine whether a bank needs additional capital support. The reason is that accounting measures are generally viewed as backward-looking as they are lagging in capturing true market strength of a bank, especially during

periods of severe liquidity crunch. This drawback makes accounting-based triggers vulnerable to delayed triggering. The risk of such delays could weaken incentives too, because it reduces the extent to which management can ease conversion risk by holding excess capital.

This discussion suggests that there will be an advantage of hybrid or dual trigger designs that combine both regulatory and market-based features. In order to guard against regulatory failure, a regulatory trigger might be augmented by a requirement that regulators initiate an investigation once market equity falls below a trigger value. Conversely, to guard against market failure, a market-based trigger might be similarly augmented by a regulatory review. Finally, the ‘regulatory uncertainty’ could be alleviated and the pressure on regulators could be reduced by making conversions automatic and based on well-specified macroeconomic indicators.



4.

Value-destroying incentives

It is important to emphasize that desirable incentive effects of CoCos are *reversed* for the case where conversion ratio is less than one-to-one – that is, where the par value of the CoCo is simply written down and is therefore *accretive* to shareholders. Despite their popularity with recent issuers, especially with European banks, (see appendix 2), the model shows that accretive conversion terms can create perverse incentives for increased leverage, or worse, ‘money burning.’ The logic is straightforward: When the bank capital is close to the trigger, the bank can ‘burn capital,’ accelerate breaching the trigger, write-down the bond’s principal, and thus capture a windfall gain for shareholders. Such bonds thus make the debt-overhang problem even worse than it is for straight debt, and thus magnify the usual ‘debt overhang’ incentives and hence increase social costs of default. This intuition does not

appear to be widely appreciated either by academics or by policymakers. On the contrary, as mentioned, the vast majority of CoCos issued to date are accretive rather than dilutive to shareholders, evidently without objection from regulators. This lack of appreciation for the value-destroying incentives of accretive conversion terms has potentially serious consequences for the future behavior of banks in the next financial crisis.

The model in this paper helps to formalize the logic of ‘money-burning’ incentives and also to calibrate the magnitude of value destruction in the event of financial distress. Numerical results show, for example, that if a bank has issued a tranche of CoCo bonds equal to 5 percent of total assets, and with principal write-downs of 75 percent upon triggering, then as the bond approaches maturity and bank capital approaches the trigger,

shareholder value could be maximized by ‘burning’ as much as 3 percent of assets to accelerate triggering and conversion. For the US\$13 trillion of assets held by US banks, in other words, this could imply the additional value destruction in the event of a future crisis of nearly US\$400 billion.

The incentives created by accretive ‘write-down’ conversion terms are obviously objectionable since they give banks the incentive to destroy additional value as they spiral into financial distress. And of course, from a policy maker’s perspective, it is exactly during the crisis that is important to have mechanisms in place that create rather than destroy incentives to preserve total asset value.





References

- Admati, Anat R., Peter M. DeMarzo, Martin F. Hellwig, and Paul C. Pfleiderer. 2010. "Fallacies, Irrelevant Facts, and Myths in the Discussion of Capital Regulation: Why Bank Equity is Not Expensive," Stanford University.
- Berg, Tobias and Christoph Kaserer, 2011, Does contingent capital induce excessive risk-taking and prevent an efficient recapitalization of banks? Humboldt Universität zu Berlin and Technische Universität München (TUM).
- Calomiris, Charles W. and Richard J. Herring, 2011, Why and How to Design a Contingent Convertible Debt Requirement, Working paper, University of Pennsylvania.
- Duffie, D., 2009, "Contractual methods for out-of-court restructuring of systemically important financial institutions", Stanford University.
- Flannery, M. J., 2009a, Market Valued Triggers Will Work for Contingent Capital Instruments, University of Florida, Working paper.
- Flannery, M. J., 2009b, Stabilizing Large Financial Institutions with Contingent Capital Certificates, University of Florida, Working Paper.
- Squam Lake Working Group on Financial Regulation, 2009, An expedited resolution mechanism for distressed financial firms: Regulatory hybrid securities. Tech. rep., Council on Foreign Relations, Center for Geoeconomic Studies.
- Strongin, Steve, Sandra Lawson, and Amanda Hindlian, 2009, Ending "Too Big To Fail", Global Markets Institute, Goldman Sachs.

Appendix 1: Model description

The paper considers a dynamic structural model of a bank operating in continuous time. Bank assets are stochastic and cash flows are proportional to assets. Taxes are zero, and dividends are paid as a residual after coupon payments.

At time 0, the bank issues both the CoCo debt and senior debt in its capital structure. Both CoCo bond and senior debt assume coupon payments, and both have the same maturity, but the CoCo bond is junior. At maturity, par values are paid to their claimants respectively, assuming the CoCo has not been converted in prior periods.

Conversion of the CoCo is triggered when the capital ratio drops below a contractually specified threshold (the model is agnostic on whether the trigger is market-based or regulatory; more on this below). The CoCo bond converts for a fixed *market value* of shares. After conversion, the bank continues to service the remaining senior debt. If asset value falls further, the bank can choose to default on its senior debt.

The bank can issue equity at any time prior to breaching the trigger, thereby raising its capital ratio and moving away from the trigger. The bank can also choose to ‘burn money’ (waste assets or capital), which allows for the possibility that the bank may be willing to pay to reduce its capital ratio and thus force conversion. Equity issuance, ‘money burning’ and default are endogenous and chosen to maximize the existing shareholders’ wealth (i.e., current share price).

The model described above is augmented by adding a number of frictions designed to accommodate practical design considerations arising from real-world concerns:

- **Transaction costs for equity issuance.** When the bank issues equity, it incurs transaction costs that have fixed and variable components. Such frictions are consistent with the lumpiness and relative infrequency of equity issues observed in the data, and their inclusion allows us to calibrate the extent to which dynamic capital structure incentives are correspondingly reduced.
- **Negative “jumps” in the diffusion process for the value of bank assets.** Jumps in the process for asset value are meant to capture the fact that financial systems are periodically hit by large crises. Since jumps can more easily swamp precautionary capital buffers held to reduce the risk of undesired (dilutive) CoCo conversion, their inclusion here allows us to calibrate their practical significance.
- **Uncertainty in the trigger mechanism.** Capital structure incentives of CoCos may be further reduced by the expectation of two possible types of trigger failure. The first is the ‘type I’ error that the CoCo fails to trigger despite capital ratios having breached the minimum threshold. This risk might arise due to poor disclosure or regulatory failure. The second is the “type II” error that the CoCo accidentally triggers even though the bank’s capital is still above contractually specified threshold. This risk might arise due to a noisy market trigger or overly-aggressive regulatory intervention. The model calibrates the incentive and pricing effects of both types of trigger failure.



Appendix 2: Existing bonds

This section briefly describes some of the 'loss absorbing' bonds issued by European banks during 2009-2012. Lloyds Banking Group issued the first contingent capital security in late 2009 with roughly £8.5 billion of the so-called 'Enhanced Capital Notes' (ECN). ECNs had terms eligible to qualify as lower Tier 2 capital upon their issue and will automatically convert into ordinary shares if the issuer's published core Tier 1 capital ratio falls below 5 percent. For this bond, the conversion to equity will take place on par for par basis. There are bonds in existence for which triggering assumes the write down of bond's principal. For example, Rabobank issued EUR1.25 billion of Senior Contingent Notes in early 2010. These securities include a write down provision of 75 percent of the principal if the bank's equity capital ratio falls below 7 percent with the remaining 25 percent of the notes to be repaid in cash. In January 2011, Rabobank issued another tranche of US\$2 billion of 8.375 percent perpetual non-cumulative capital securities which can be written down if the bank's equity capital ratio falls below 8 percent. Unicredit Group issued EUR500 million of a perpetual non-cumulative 9.375 percent Tier 1 in mid-2010. This security too has a write down feature triggered if the total capital ratio reaches 6 percent.

In contrast to these bonds, regulators were given contractually specified discretion to trigger the Intesa

Sanpaolo 9.5 percent perpetual Tier 1 securities issued in fall 2010. These contain a loss-absorption feature under which the principal is written down if the bank's total capital ratio falls below 6 percent or other minimum threshold specified by regulators. Similarly, in February 2011, Credit Suisse issued around CHF6 billion equivalent of high-trigger Tier 1 contingent capital notes. These securities will convert into bank's equity if:

- 1) the group's reported Basel 3 common equity Tier 1 ratio falls below 7 percent, or
- 2) Swiss Financial Markets Authority FINMA determines that Credit Swiss "requires public sector support to prevent it from becoming insolvent, bankrupt or unable to pay a material amount of its debts, or other similar circumstances."

Subsequently, in March 2012, Credit Suisse has opened the order book for a high-trigger contingent capital issue. The rate of the debt is expected to be from 7 percent to 7.25 percent, and the deal would more than CHF250 million. Under the terms, it will convert into equity if the bank's Core Tier 1 ratio falls below 7 percent or if the bank is declared non-viable.



kpmg.com/socialmedia



kpmg.com/app



The information contained herein is of a general nature and is not intended to address the circumstances of any particular individual or entity. Although we endeavor to provide accurate and timely information, there can be no guarantee that such information is accurate as of the date it is received or that it will continue to be accurate in the future. No one should act on such information without appropriate professional advice after a thorough examination of the particular situation.

© 2013 KPMG International Cooperative ("KPMG International"), a Swiss entity. Member firms of the KPMG network of independent firms are affiliated with KPMG International. KPMG International provides no client services. No member firm has any authority to obligate or bind KPMG International or any other member firm vis-à-vis third parties, nor does KPMG International have any such authority to obligate or bind any member firm. All rights reserved.

The KPMG name, logo and "cutting through complexity" are registered trademarks or trademarks of KPMG International.

Designed by Evalueserve. Publication name: Incentive Effects of Contingent Capital. Publication number: 130285. Publication date: October 2013