Contingent convertible bonds: design, regulation, usefulness

Strengthening banks' capital base was one of regulatory and supervisory authorities' central objectives following the financial crisis of 2007-08. Contingent convertible bonds (CoCo bonds or CoCos) were discussed as a possible instrument with which to achieve this goal. CoCos are bonds that are converted into common equity tier 1 capital or written down if contractually specified trigger events occur. Under the Basel III rules, they are recognised as regulatory capital under certain conditions. Investors and the regulatory authorities had expected this instrument both to set suitable incentives to improve risk management and monitoring and to increase banks' total loss absorbing capacity under normal business conditions. This would, the logic went, strengthen banks' resilience. Finally, the hybrid nature of CoCo bonds – they include features of both equity and debt – was to give them a cost advantage vis-à-vis common equity tier 1 capital.

However, a critical analysis of CoCo bonds, both at the theoretical level and in terms of how they are currently employed in practice, makes it clear that this instrument's high complexity makes it difficult to steer the transmission and incentive mechanisms in a targeted manner and increases the danger of undesirable side effects. Moreover, given the way in which CoCos are currently being designed, banking regulators have doubts about their effectiveness as a loss absorbing instrument for banks on a going-concern basis. This consequently raises the question of whether the requirements for recognising CoCo bonds as regulatory capital should at least be tightened in the short term. In the long term, however, a stronger focus on common equity tier 1 capital looks like a better way to strengthen banks' stability.

Introduction

Additional hybrid capital instrument

In response to the 2007-08 financial crisis, the Squam Lake Group of Anglo-American economists in 2009 proposed contingent convertible bonds as a possible instrument for strengthening banks' capital base.[1] These securities are a hybrid form of financing and thus combine the usual characteristics of debt financing[2] with equity's ability to absorb losses. The use of such instruments is also intended to help create incentives for improved risk management and monitoring and to strengthen banks' stability overall.

Characterisation

CoCo bonds are subordinated bonds that pay a coupon and are either converted into common equity tier 1 (CET1) capital or written down when contractually specified trigger events occur.[3] In this manner, they may contribute to a quantitative increase in banks' regulatory capital in a way that pure debt capital cannot. After the write-down or conversion into common equity tier 1 capital, banks' capital base will even be strengthened in qualitative terms. CoCos differ from traditional convertible debentures in that conversion cannot be triggered by the bondholder; it must take place automatically and immediately, ie without delay, when the conditions specified in the contract are met.

Market trends

In recent years, CoCo bonds have gained in importance in practice. After a first issuance by the UK's Lloyds Banking Group in November 2009, CoCo bonds were initially issued mainly in Europe. Because they are implicitly mentioned in the Basel III rules on regulatory capital, they have of late increasingly also been issued outside of Europe, especially in Asia.[4] According to the financial data services Bloomberg and Dealogic, by the end of 2017, 398 CoCo bonds had been issued in Europe alone (of which EU: 285) with a total volume of €230 billion (of which EU: €193 billion).[5] These numbers can largely be attributed to issuance by UK as well as Swiss, French and Spanish banks. In Germany, just 17 issues with a volume of €6.2 billion were registered in the same period (see the chart on page 55). One possible explanation for the comparatively low issuance volume in Germany is the earlier debate on the tax deductibility of coupon payments for CoCo bonds, which was not permitted until 2014.[6] In terms of ownership structure, little detailed data are currently available. According to what is known, European CoCo bonds are currently mostly held by investors outside the euro area, followed by mutual funds mainly located in Ireland and Luxembourg. Banks and insurers, by contrast, hardly ever hold CoCo bonds directly, though they may be indirectly invested in them via foreign central securities depositories, for instance.[7]

Critical analysis and review of regulatory treatment

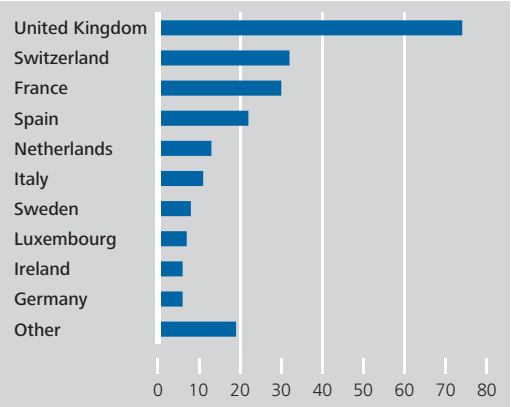
Although CoCo bonds currently make up a small percentage of European institutions' regulatory capital, a critical assessment makes sense given the current market situation and

1 See Squam Lake Working Group on Financial Regulation (2009), An expedited resolution mechanism for distressed financial firms: regulatory hybrid securities, Council on Foreign Relations, April. For more on the original idea behind CoCos, see also M J Flannery (2005), No pain, no gain? Effecting market discipline via reverse convertible debentures, in H S Scott, Capital adequacy beyond Basel: banking, securities, and insurance, Oxford University Press, pp 171-196.
2 Specifically, this means a fixed rate of interest, coupon payments that are potentially tax deductible, broader agreement among the existing equity holders to issue such paper in good times and, provided an appropriate design is chosen, potentially a lower cost of capital as well as possibly easier issuance of debt capital given the signalling effects associated with issuing equity capital (see the section entitled "Bank-specific implications of CoCo design" on pp 57-61).
3 In this context, write-down means that the issuer's liabilities from the CoCo bond lapse. This generates a profit, which increases the issuer's capital.
4 CoCo bonds have been eligible as regulatory capital under Basel III since 2013. Within the EU, eligibility was introduced with the Capital Requirements Regulation (CRR) at the beginning of 2014.
5 This does not include bonds for which no information on the loss absorbing mechanism (conversion or write-down) is available. Based on global data as at 2015, a study by the Bank for International Settlements puts total issuance volume for CoCo bonds at €522 billion from 731 issues. Of these issues, 39% were conducted by European banks. See S Avdjiev, B Bogdanova, P Bolton, W Jiang and A Kartasheva (2017), CoCo issuance and bank fragility, BIS Working Papers No 678.
6 See Federal Ministry of Finance, Steuerliche Behandlung von Instrumenten des zusätzlichen Kernkapitals nach Art. 51 ff. CRR of 10 April 2014.
7 See M A Boermans and S van Wijnbergen (2018), Contingent convertible bonds: who invests in European CoCos?, Applied Economics Letters 25 (4), pp 234-238.

their regulatory recognition.[8] Signs that the current issuance practice is having undesirable side effects that could have resulted in the market turbulence witnessed in the early part of 2016 raise the question of whether the expectations that banks, investors and regulators have placed in CoCos have been met so far. In this context, a debate is needed on what role the regulatory recognition of CoCo bonds in relation to CET1 capital has for issuance practice and whether this regulatory treatment should be changed.

Total volume of CoCo bonds issued by European banks from 2009 to 2017

€ billion



Sources: Bloomberg and Dealogic.
Deutsche Bundesbank

Objectives, design and regulatory treatment

General expectations of CoCo bonds

According to the relevant literature, banks may issue CoCo bonds in order to give themselves an additional loss absorbing instrument besides existing CET1 capital. In particular, that would allow them to increase their loss absorbing capacity even before a crisis occurred, while paying a low market price for risk assumption and without diluting the owners' right of control from the outset. Because it is assumed to have a cost advantage as compared to CET1 capital,[9] using this instrument is intended to help prevent banks from having to curtail their activities, especially lending.[10] In addition, the conversion of CoCo bonds is to provide additional CET1 capital if needed. This helps prevent, say, balance-sheet deleveraging at short notice, which would otherwise be necessary.[11] Moreover, through a tailored contractual structure, the use of CoCo bonds is intended to give banks' management incentives to enhance risk management and monitoring. The purpose of this is to lower the risks for individual banks and, as a consequence, for the banking system as a whole. This could reduce the need for government rescue measures and stabilise the real economy.[12]

Design of CoCo bonds

Whether CoCo bonds meet the expectations outlined above largely depends on their design. Key factors besides the nature of the trigger event and its threshold value are the form of loss absorption and the volume of CoCo bonds issued.

Trigger event

In terms of the trigger event, the academic literature distinguishes between mechanical and discretionary triggers. Where the trigger event is mechanical, conversion or write-down is triggered automatically once a threshold defined either based on market values or on balance sheet or regulatory metrics is reached. Market-based threshold values can be derived from, say, stock prices, sector indices or macroeconomic parameters, while capital ratios and measures of the return on equity, for instance, can be used as regulatory or balance sheet

8 For instance, CoCo bonds represent around 10% of UK banks' total capital, but less than 2% of German banks' total capital.
9 The lower costs may result, amongst other things, from the potential tax deductibility of coupon payments. However, this also depends on the design of tax legislation in the country in question.
10 There is no consensus in the literature on how capital levels impact lending. Studies show, however, that irrespective of any potential cost advantage that certain capital instruments enjoy over others, a strengthened capital base alone can have positive effects on bank lending; see C M Buch and E Prieto (2014), Do better capitalized banks lend less? Long-run panel evidence from Germany, International Finance, 17 (1), pp 1-23.
11 See A R Admati, P M DeMarzo, M F Hellwig and P Pfleiderer (2013), Fallacies, irrelevant facts, and myths in the discussion of capital regulation: why bank equity is not socially expensive, Rock Center for Corporate Governance Working Paper Series No 161.
12 See R W Greene (2016), Understanding CoCos: what operational concerns and global trends mean for U.S. policymakers, M-RCBG Associate Working Paper No 62, Harvard University; C Pazarbasioglu, J Zhou, V Le Leslé and M Moore (2011), Contingent capital: economic rationale and design features, IMF Staff Discussion Note, SDN/11/01.

thresholds. The calibration of the threshold value determines when the trigger is activated. By contrast, discretionary trigger events relate to assessments and decisions by third parties, such as supervisory or resolution authorities.

Loss absorption mechanism

Another key feature of CoCo bonds is the loss absorption mechanism. It determines whether the trigger event prompts conversion or write-down, and what this must look like. If conversion into CET1 capital is prescribed, the conversion rate[13] determines the dilution of the original equity holders' claims. Dilution refers to the shift in control rights as well as in profit and loss distribution. Depending on the conversion rate, its impact on the original equity holders may differ. Substantial dilution redistributes future claims to profits and losses to the (former) CoCo bond holders to a considerable extent. A small degree of dilution leaves these claims primarily with the original owners. In the context of a CoCo bond issue, the conversion rate may be defined as fixed (determined when the bonds are issued) or variable (determined at the point of conversion based on market prices).[14] Once effected, a conversion cannot be reversed. After a write-down, by contrast, "write-ups" are theoretically possible once a bank has overcome its crisis. In a write-down, the CoCo bond holder suffers direct losses, but does not, unlike in a conversion, receive any equity. In each of these cases, the contract must specify whether a conversion or write-down should take place in full or partially and what gradations are envisaged in the case of a partial conversion or write-down.

Other features

In addition to the trigger event and absorption mechanism, a number of additional features must be specified in the contract. These include, in particular, the term, issue volume, any call options on the issuer's part and the coupon level as well as the possible option to suspend or delay the coupon payment.

Regulatory treatment

The design of the CoCo bond contract is up to the issuer and is not subject to any special regulatory requirements. However, the possibility of having CoCo bonds counted as additional tier 1 capital (AT1) or tier 2 capital (T2) gives banks an incentive to issue CoCo bonds with features that enjoy preferential regulatory treatment. In this way, banking regulators, too, can influence the market and thus help ensure that the general expectations regarding CoCo bonds as outlined above are met.

Criteria for eligibility as AT1 capital

From a prudential standpoint, CoCo bonds must be permanently available to the issuing institution to cover losses if they are to be recognised within the EU as AT1 capital pursuant to Article 52 (1) Capital Requirements Regulation (CRR) before their conversion. In this way, they are intended primarily as going-concern instruments. Specifically, CoCos must, amongst other things, be subordinated to T2 capital instruments in the event of insolvency. They must also have an unlimited maturity, and the terms of the contract must contain a threshold value for the CET1 ratio of the issuing institution of at least 5.125%.[15] A conversion or write-down of the CoCo bond must therefore take place when the CET1 ratio falls below this threshold, at the latest. In addition, it must be possible for the issuer to unilaterally suspend coupon payments for an indefinite period and on a non-cumulative basis, ie without substitution.[16] Around 80% of CoCo bonds issued in the EU

13 The conversion rate expresses how many equity stakes CoCo bond holders will receive in return for their bonds.
14 Where the conversion rate is variable, a floor and/or a ceiling may additionally be specified.
15 See Article 54 CRR. This figure is calculated as the minimum requirement for common equity tier 1 capital plus the bottom quartile of the capital conservation buffer (4.5% minimum requirement plus 0.625% capital conservation buffer, expressed as a proportion of the total risk exposure amount) below which a full moratorium on dividend payments applies to the institution.
16 In addition, Article 437 CRR also stipulates special transparency requirements for own funds for CoCo bonds as part of Pillar III reporting. The issuance of additional tier 1 capital is regularly monitored by the European Banking Authority (EBA); see EBA (2016), EBA report on the monitoring of Additional Tier 1 (AT1) instruments of European Union (EU) institutions – Second update: FINAL. In addition, the EBA has drawn up standardised clauses for AT1 issues. These clauses aim to make it easier for smaller institutions especially to access hybrid capital instruments, and to create additional transparency. See EBA, EBA standardised templates for Additional Tier 1 (AT1) instruments – Final, EBA report, 10 October 2016.

as a whole are eligible as regulatory AT1 capital according to the current definition. The remaining issues include other CoCo bonds with contractually fixed trigger events which may be recognised as tier 2 capital (T2) under certain circumstances (see the adjacent chart).

Criteria for eligibility as T2 capital

Where CoCo bonds do not meet the requirements of Article 52 (1) CRR, they may qualify as T2 instruments if the conditions set out in Article 63 CRR are met. In contrast to AT1 eligibility, this does not require a mechanical trigger event. In addition, T2 instruments may have a limited maturity, though it must be at least five years. There are, however, instances in which instruments that are allocated to T2 capital because of their limited maturity have a mechanical trigger event that could take place before that of CoCos eligible as AT1 instruments. That said, as CoCo bonds in T2 capital play a fairly subordinate role in practice, we will not discuss them in any great detail in this article.

Exceptional regulatory power of intervention

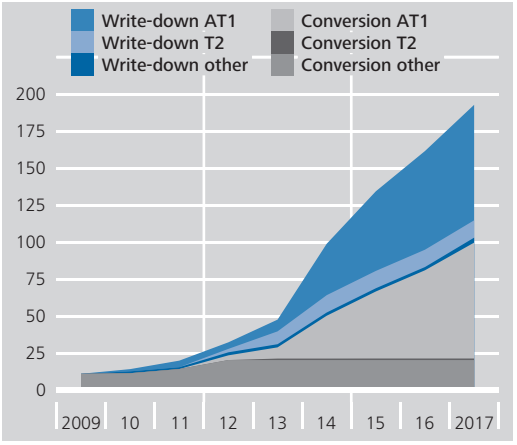
Irrespective of the contractually pre-defined trigger event, the resolution authorities must stipulate conversion or write-down of all AT1 and T2 instruments if the point of non-viability (PONV) was established. This describes the point in time as of which an institution is no longer viable without a (forced) conversion or write-down of all relevant capital instruments.[17] This is the case irrespective of the concrete design of the instruments in question.

CoCos in the event of resolution

In the event of resolution (gone concern), CoCo bonds that have not already been triggered ultimately help ensure that losses are absorbed by CoCo bond holders through write-down or conversion and all senior creditors are therefore potentially given preferential treatment. If the relevant criteria are met, CoCos can therefore be recognised under the Minimum Requirement for Own Funds and Eligible Liabilities (MREL) or Total Loss Absorbing Capacity (TLAC).[18] However, unlike other MREL or TLAC-eligible instruments, they offer no additional advantages in the event of resolution.[19]

Composition of EU CoCo bond issuance

€ billion



Sources: Bloomberg and Dealogic.
Deutsche Bundesbank

Bank-specific implications of CoCo design

The many different ways in which CoCo bonds can be designed implies a complex system of effects and incentives, which harbours the risk of undesirable side effects. To be used effectively, then, the trigger and absorption mechanism must be chosen and structured prudently. Their complexity also renders it difficult to establish a liquid market, as investors need to be aware of the exact design of each individual CoCo.

Trigger

When defining the trigger, some of the decisions the issuer makes are as follows. Is the trigger based on market values or accounting values/regulatory metrics? To what extent is the CoCo triggered mechanically or with the involvement of the competent supervisory au-

17 See Recital (81) BRRD, Article 59 BRRD or section 89 of the Act on the Recovery and Resolution of Institutions and Financial Groups (Gesetz zur Sanierung und Abwicklung von Instituten und Finanzgruppen). As a result, almost all European CoCo bonds issued in practice are affected (see above chart).
18 See also Deutsche Bundesbank, Bank recovery and resolution – the new TLAC and MREL minimum requirements, Monthly Report, July 2016, pp 63-80.
19 See Deutsche Bundesbank, The institutional framework for bank resolution in the EU, Financial Stability Review 2017, pp 34-36.

thority? The issuer may also consider whether to define multiple trigger events which have to occur simultaneously or which can activate loss absorption independently of each other.

Accounting value/regulatory triggers and market value triggers

With regard to accounting value/regulatory triggers, it should be noted that these can be imprecise for two reasons. First, the use of discretionary scope for accounting valuations could delay activation of the trigger. Second, these metrics normally rely on data that are publicly disclosed only on certain reporting dates. However, the instrument would have to be converted or written down immediately, possibly between reporting dates.[20] Yet there is some question as to whether all issuers are able to monitor the relevant triggers in sufficiently good time, which means that timely loss absorption is not always ensured.[21] Market value triggers, by contrast, are more transparent in principle, giving better assurance of timely trigger activation. However, certain market value metrics, such as stock prices, are not available for all banks. In Europe, for example, only around one-third of the banks directly supervised by the European Central Bank (ECB) are listed on an exchange.[22] Market value triggers can also be activated by market movements which do not reflect changes in the fundamental values, but instead result from changes in market liquidity, for instance. In addition, it is also conceivable for speculative attacks to activate the trigger.[23] Even if the contractual threshold is breached for just a short time, this is generally enough to trigger conversion or write-down. This can occur in periods of heavy market turbulence, in particular. After weighing up the pros and cons, an accounting value trigger would appear more workable from a banking regulation perspective. The relevant rules in the EU stipulate that, to qualify as AT1 capital, CoCo bonds must be pegged to the CET1 ratio.

Discretionary and mechanical triggers

Mechanical triggers are especially transparent and easy to use, as the issuer or CoCo bond holder can observe when they are breached, without the need for a third-party decision. However, additional information over and above the specific trigger cannot be taken into account where exclusive use is made of a single mechanical trigger. By contrast, discretionary triggers permit the use of extensive and complex information, but entail the risk that the decision required to activate the trigger is made too early or too late. Activation by supervisors may also be taken as a negative signal by market participants and could cause negative externalities. It is also possible to consider combinations of different triggers. For example, it would be conceivable to simultaneously combine a mechanical trigger based primarily on bank-specific aspects with a discretionary trigger that takes into account the state of the entire banking system.[24]

Current trigger design in the EU

The CoCo bonds issued in the EU to date have predominantly had a single mechanical trigger. All of them use a CET1 capital ratio as a bank-specific regulatory threshold, with conversion or write-down automatically triggered when capital falls below that level.[25] For CoCo bonds that qualify as AT1 or T2 instruments, regulators in the EU generally also have the power to intervene and force conversion or write-down if the PONV is identified. Market value triggers play no role for CoCos issued in the EU, nor is there currently any evidence of combined trigger events (eg allowing systemic components to be taken into account), which have to occur

20 This is the case, for example, when the trigger is pegged to the CET1 ratio, which is normally publicly disclosed on a quarterly basis only.
21 See CW Calomiris and RJ Herring (2013), How to design a contingent convertible debt requirement that helps solve our too-big-to-fail problem, Journal of Applied Corporate Finance 25 (2), pp 66-89.
22 See T Berg and C Kaserer (2015), Does contingent capital induce excessive risk-taking?, Journal of Financial Intermediation 24, pp 356-385.
23 Holders of heavily dilutive CoCo bonds and investors short selling equity instruments could profit from speculative attacks, particularly if a market-based threshold (eg a stock price) is approached. This is not possible with accounting value triggers.
24 The Squam Lake Group proposes that the CoCo bond be converted after the bank-specific trigger event only if the competent authorities identify a systemic crisis at the same time; see Squam Lake Working Group (2009), op cit.
25 Any deviations from this are down to transitional provisions.

simultaneously. This principally reflects the prudential requirements for CoCos to be recognised as AT1 capital in the EU.

Threshold

The other factor that is crucial to a CoCo bond's effect, besides the trigger, is the threshold which activates conversion or write-down. In order for a CoCo to effectively become available for loss absorption and thus ensure the issuer remains a going concern, the threshold should be defined such that timely activation can be assured.[26] This is the case if the positive effects of loss absorption at least compensate for potential side effects such as unwanted signalling effects. A threshold that triggers conversion or write-down very early on can send a negative signal at an especially early stage, thus eliciting inappropriate market reactions. Shareholders of listed banks could offload their equity instruments to pre-empt the trigger. Any slump in stock market prices that this might potentially cause would thus be driven by low market liquidity, herd behaviour, a lack of transparency and information asymmetries, and could overstate the actual decrease in the underlying enterprise value of the bank concerned.[27] Conversely, a CoCo bond with a threshold that triggers conversion or write-down at a very late stage fails to serve the desired purpose, which is to function as a loss absorbing instrument on a going-concern basis.

Current threshold design in the EU

Roughly 44% of the total issue volume of CoCo bonds in the EU since 2009 have a CET1 ratio of 5.125% as their threshold. This corresponds to the minimum level required to qualify as AT1 capital in the EU. Looking at this threshold in relation to the overall prudential CET1 capital requirements – including the buffer requirements and, where applicable, the Pillar II requirements – it is questionable whether the CoCo bonds issued in the EU thus far are actually able to perform their function as a loss absorbing instrument on a going-concern basis. As things currently stand, it is possible for these overall requirements to be undershot or for the PONV to be identified by the resolution and supervisory authorities prior to the contractual trigger event even occurring. CoCos would then only really come into play in the event of a bank failure and would no longer serve the purpose of absorbing losses on a going-concern basis. For this reason, it would be worth considering raising the regulatory requirement for the threshold for AT1-eligible CoCos.

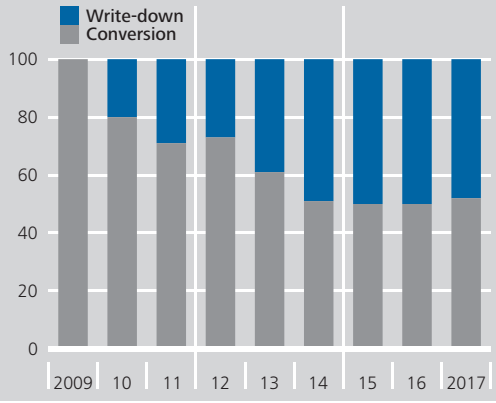
Loss absorption

The regulatory requirements for AT1-eligible CoCos allow for both conversion into CET1 capital and permanent or temporary write-down as loss absorption mechanisms. Conversion-to-equity (CE) CoCo bonds set incentives for equity holders and the bank's management to strengthen risk management and monitoring when they entail sufficiently substantial dilution.[28] This is the case when rights of control over, but also of participation in, future profits and losses are transferred on a large scale to the former CoCo bond holders. This then sets an incentive for the original equity holders to avoid conversion and to make additional CET1 capital available ahead of time, for example.[29] Similarly to a threshold that activates loss absorption very early on, however, substantial dilution can also prompt existing stakeholders to sell their stock early and thus cause a price drop.[30] Principal write-down (PWD) CoCo bonds flip this incentive structure. They give equity holders and the bank's management incentives to take on greater risk, because when the trigger event occurs the control and participation rights remain unchanged, but a portion of the losses are borne by the

26 See RW Greene (2016), op cit; CW Calomiris and RJ Herring (2013) op cit; C Pazarbasioglu et al (2011), op cit.
27 See RW Greene (2016), op cit.
28 See CW Calomiris and RJ Herring (2013) op cit; C Pazarbasioglu et al (2011), op cit; S Chan and S van Wijnbergen (2017), CoCo design, risk shifting, incentives and capital regulation, Tinbergen Institute Discussion Paper TI 2016-007/VI.
29 See CW Calomiris and RJ Herring (2013) op cit; S Chan and S van Wijnbergen (2015), CoCos, contagion and systemic risk, CEPR Discussion Paper No 10960.
30 See RW Greene (2016), op cit.

Market shares of EU CoCos with a conversion or write-down mechanism

%



Sources: Bloomberg and Dealogic.
Deutsche Bundesbank

CoCo bond holders.[31] In terms of incentives, then, the literature favours CoCo bonds with a conversion mechanism over those that are written down. However, this form of bond is only available to corporations. Other legal structures, such as cooperatives, can only issue PWD CoCos. It would thus appear logical to give regulatory approval for both mechanisms.

Current loss absorption set-up in the EU

One possible way to explain why the EU has largely seen issuance of CoCo bonds with a PWD loss absorption mechanism is that it is ultimately the holders of bank equity that decide on CoCo issuance.[32] By the end of 2017, PWD CoCos made up 48% of the total issue volume of CoCo bonds (see the above chart). This decision-making power of the banks' equity holders could also explain why, though not the desired outcome from a regulatory perspective, CE CoCo bonds almost exclusively involve a small degree of dilution of the original equity holders' stakes. As a result, the future control and profit participation rights of the original equity holders are barely affected by the trigger event occurring.[33] The current design of CoCo bonds thus tends to set perverse incentives, leading banks to take on greater risk. From a regulatory perspective, therefore, the aim should be for substantial dilution, thus setting incentives for the original equity holders to ensure sustainable risk provisioning.

Issue volume

In order for CoCo bonds to effectively perform their loss absorption function, the issue volume, which is converted or written down when the trigger event occurs, has to be large enough relative to a bank's total capitalisation.[34] Looking at banks' overall funding structure, the literature also advocates using CoCo bonds not as a substitute for, but in addition to, available equity capital.[35] This aligns with the original objectives of the Basel III framework, which focuses on increasing and improving the quality of regulatory own funds and thus primarily on strengthening CET1 capital.[36] Accordingly, AT1 instruments such as CoCo bonds should only be used in addition to available CET1 capital.

Current issue volume in the EU

Although the volume of CoCo bonds issued in the EU has risen significantly since 2009, it has so far remained at a relatively low level. CoCo issuers tend to be larger, well-capitalised banks.[37] On the one hand, it therefore seems unclear whether CoCo bonds are an effective instrument for loss absorption in their current design, but on the other hand, this may not be necessary provided banks hold sufficient CET1 capital. In light of this, there is, in principle, no need for higher volumes of CoCos from a regulatory perspective. Instead, it would seem more expedient to maintain the focus on strengthen-

31 CoCos that are partially written down can also generate negative liquidity effects when triggered if, at the same time, the remaining principal amount is paid out to CoCo bond holders; see D Bleich, Contingent convertible bonds and the stability of bank funding: the case of partial write-down, Deutsche Bundesbank Discussion Paper, No 28/2014.
32 See S Avdjiev, B Bogdanova, P Bolton, W Jiang and A Kartasheva (2017), CoCo issuance and bank fragility, BIS Working Papers No 678.
33 This was the finding of a study of CoCo bonds issued by major European banks, which estimated their dilution in the period between 2009 and 2013. See T Berg and C Kaserer (2015), op cit.
34 See S Maes and W Schoutens (2012), Contingent capital: an in-depth discussion, Economic Notes 41 (1/2), pp 59-79.
35 See C Pazarbasioglu et al (2011), op cit; C W Calomiris and R J Herring (2013), op cit; N Chen, P Glasserman, B Nouri and M Pelger (2017), Contingent capital, tail risk, and debt-induced collapse, Review of Financial Studies 30 (11), pp 3921-3969.
36 See Basel Committee on Banking Supervision (2017), High-level summary of Basel III reforms.
37 See S Avdjiev et al (2017), op cit.

ing CET1 capital, partly because market demand for CoCos could be low.

Trade-off between tax deductibility of coupons and supervisory requirements

There are primarily three identifiable reasons for issuing CoCo bonds. Their potential to qualify as regulatory capital, especially as AT1 capital, has already been discussed as a first incentive for their use. A second motive relates to the coupon payments being tax deductible, as against equity capital.[38] Whether or not the coupons are tax deductible depends on the applicable national tax law. Generally, the actual CoCo design has to emphasise its debt-like nature, thus clearly delineating it from equity instruments. This can be achieved, for instance, by defining a threshold which would see the trigger activated at a comparatively late stage. This results in a trade-off between regulatory and tax-related considerations in the design of CoCo bonds. From a regulatory perspective, the tax treatment creates a perverse incentive for the threshold to be set as low as possible.[39] In terms of eligibility as AT1 capital, European regulators should give this problem due consideration. In this context, the current CET1 ratio of 5.125% seems too low and should be raised.

Costs compared with CET1 capital

The third motive for issuance discussed in the literature is whether CoCo bonds generate lower costs for banks than CET1 capital.[40] Besides their preferential tax treatment, one possible reason for such cost advantages is that, until the trigger event occurs or the coupon payment is suspended, the equity holders alone bear the bank's losses. However, it is uncertain whether this cost advantage over CET1 capital actually exists. CoCo bonds make their holders senior participants in the bank's losses, but cap their participation in its profits through a fixed coupon. This has to be offset by higher coupons compared to senior debt. Even factoring in low market liquidity, it is at least conceivable that CoCo bonds could generate higher costs for banks than CET1 capital. Analyses of banks indicate that there are indeed price premiums of this sort compared with equity in the market.[41]

Impact across banks

Potentially undesirable side effects of CoCos across banks

Whether or not the potential effect of individual banks seeing an improvement in their loss absorbing capacity can spill over to the banking system as a whole also depends on the possibility of undesirable side effects of the use of CoCo bonds across banks occurring. The aforementioned complexity of CoCo bonds not only affects the universe and behaviour of issuers and holders but also increases the risk that the instrument is not fit for purpose and therefore ultimately fails to achieve its intended effect. Thus, for instance, the trigger could be mistimed, impairing loss absorbing capacity. In addition, the increased issuance of CoCo bonds with a write-down mechanism could impair the incentive to manage and monitor risk.[42] Even in the absence of such design flaws, CoCo bonds could transmit bank-specific risks to other banks and financial market agents (eg insurers, mutual funds and hedge funds).[43] There are two transmission channels. One is that CoCos can create additional linkages among banks.[44] The other is that information-based contagion effects could occur.[45]

Undesirable effects caused by additional linkages

Additional linkages of issuers with banks and other financial agents can give rise to undesirable effects in a variety of ways. As regards CoCo bonds with a write-down mechanism, holders take an immediate hit if the trigger event occurs. Once the final write-down has occurred, CoCo bond holders relinquish their

38 See C W Calomiris and R J Herring (2013), op cit.
39 See the previous section on the current threshold design of European CoCos. Large parts of the total issue volume use the exact regulatory requirements as thresholds.
40 See C W Calomiris and R J Herring (2013), op cit.
41 For example, this is demonstrated by an oft cited comparison of average CoCo yields and dividends by Bank of America Merrill Lynch; see, for instance, https://www.usatoday24x7.com/are-happy-days-in-credit-over-according-to-bofa-just-one-thing-matters/
42 See the above discussion on the design of CoCo bonds.
43 See A R Admati, P M DeMarzo, M F Hellwig and P Pfleiderer (2013), op cit; R W Greene (2016), op cit.
44 See R W Greene (2016), op cit; C Koziol and J Lawrenz (2012), Contingent convertibles. Solving or seeding the next banking crisis?, Journal of Banking and Finance 36, pp 90-104.
45 See S Chan and S van Wijnbergen (2015), op cit.

claim to a coupon payment and especially to the face value of the CoCo bond. These losses eat into the holders' balance sheet capital, thereby impairing additional loss absorbing capacity. In the case of conversion, however, linkages through debt can create linkages through equity, thereby involving the new owners directly in the issuer's entrepreneurial risk. If the new owners are subject to stricter investment restrictions here than in the case of CoCos,[46] the equity instruments created in this manner would have to be sold. That could trigger price volatility in the equity markets. These linkages could pose a problem in both designs in those cases where banks hold each other's CoCo bonds,[47] potentially impairing the loss absorbing capacity of all institutions involved.[48]

Information-based contagion effects

The occurrence of the trigger event or suspension by a bank of coupon payments can also lead to information-based contagion effects. Owing to similar risks and performance patterns of various banks' investments, these banks can suffer simultaneous losses. Holders of CoCo bonds could therefore see the occurrence of a trigger event at another bank as a negative signal and fear a triggering of their CoCos. The more highly correlated the risks and performance patterns of the banks involved are, the stronger this effect is. These CoCo bond holders could respond by offloading their holdings, which would generally put pressure on prices in the CoCo bond market.[49] Such signals could, by the same token, create interactions with other markets. The sell-off stimulus from the CoCo market could, for instance, spill over to other debt, ultimately triggering a bank run. Equity instruments could additionally come under pressure. That has the potential to create a conflict between bank-specific and interbank effects of CoCo bonds: triggering a bank's CoCo bonds can increase that institution's individual loss absorbing capacity, while at the same time having the aforementioned adverse side effects on other banks.

Potential holders

In addition to the specific design of the bond, the holder structure is another factor which is decisive as to whether the use of CoCo bonds can bring about undesirable effects. The relevance of information-based contagion effects is illustrated by the market turmoil caused in early 2016 by fears that one individual bank could suspend its coupon payments. What this observation also shows is that this type of instrument is not a suitable investment instrument for all potential holders. In principle, the relatively high potential yields that CoCo bonds appear, at first glance, to offer compared to conventional bank bonds lend them (especially in the current low-interest-rate environment) a certain attraction as a capital investment. Owing to their major scope for discretion in their design features, CoCos are, however, highly complex and opaque instruments. They are fraught with numerous risks (such as losses caused by write-downs or conversion, or coupon cancellation), making them difficult to price. The European Securities and Markets Authority (ESMA)[50] and the German Federal Financial Supervisory Authority (BaFin)[51] therefore both have their doubts about the suitability of these instruments for private investors. In-

46 For instance, the Solvency II insurance regulation regime (Article 68 of Delegated Regulation (EU) 2015/35) provides for a deduction rule under which insurers' participations in financial and credit institutions in excess of 10% of the insurer's own funds have to be deducted from regulatory basic own funds. Moreover, mutual funds can also pursue clearly defined contractual investment strategies which could likewise lead to selling-off following the conversion of a CoCo bond.
47 See F Allen and D Gale (2000), Financial contagion, Journal of Political Economy, Vol 108, No 1, pp 1-33.
48 As holders of eligible CoCo bonds, banks are required to treat these the same as other mutual bank equity interests for regulatory purposes before they are triggered. The risk-weighted capital ratio is reduced owing either to an increase in risk-weighted assets or to a deduction from capital.
49 See S Chan and S van Wijnbergen (2015), op cit.
50 See ESMA (2014), Statement on potential risks associated with investing in contingent convertible instruments.
51 "Those investors who lack a profound understanding of the financial sector, the functioning of the bonds and, above all, banks' regulatory own funds requirements […] should not invest in CoCo bonds. It is very difficult to estimate the inherent risks, particularly for retail investors. […In] view of their complex product structure, their purpose, the difficulties in valuing them and the potential conflict of interest for banks, BaFin has considerable doubts as to whether CoCo bonds are a suitable product for retail investors. In general, they are not suitable for active distribution to retail clients." https://www.bafin.de/SharedDocs/Veroeffentlichungen/EN/Fachartikel/2014/fa_bj_1410_coco-bonds_en.html;jsessionid=8DE62A70A238B6A2D3F3CFC6F14961BA.2_cid298

deed, the sale of these products to retail investors is prohibited in the United Kingdom.[52] By contrast, banks and other institutional investors, such as insurance companies and mutual funds, fundamentally appear to be a more plausible group of investors in CoCo bonds.[53] Owing to their business activities, these entities should possess sufficient risk assessment and portfolio diversification capacity. This should put them in a better position to adequately understand CoCo bonds and how they work and to act accordingly. Nonetheless, even institutional investors seem to find it difficult to price these bonds.[54] Owing in particular to potential interaction caused by mutual equity holdings between banks, these seem, among institutional investors, to be the least suited to holding CoCo bonds.

Current holder structure

The present level of usage and the current holder structure do not indicate a material hazard posed by undesirable interbank side effects of the use of CoCo bonds. As described above, European CoCo bonds are held mostly by non-euro area investors and European mutual funds. Banks and insurers are virtually irrelevant as direct holders of CoCo bonds.[55] Owing to the insufficient availability of data, it is currently impossible to tell whether or not they may be holding CoCos indirectly, such as through foreign central securities depositories (CSDs). In addition, the holder structure can vary considerably by region and on a case-by-case basis, and is also subject to considerable change over time. Against this background, it would appear appropriate for supervisory authorities to monitor trends in the CoCo bond market more closely in order to identify, in a timely manner, potential undesirable effects, both for individual banks as well as across banks.

Conclusion

Following on from the 2007-08 financial crisis, policymakers, regulators and academic researchers all called for a strengthening of the quantity and quality of bank capital. This was to ensure that banks held sufficient loss absorbing capital in order to continue as a going concern, while at the same time enhancing banks' stability. In the meantime, banks have made major strides in increasing their capital ratios, both by accumulating additional CET1 capital and by reducing their risk-weighted assets.

CoCo bonds, a form of hybrid capital instrument, can be recognised under certain conditions as regulatory AT1 or T2 capital. The specific design of these highly complex instruments is what ultimately determines whether CoCo bonds will be able to meet expectations.

The actual design of CoCo bonds gives rise to doubts about their effectiveness for banks as a loss absorbing instrument on a going-concern basis. It is particularly the low CET1 thresholds seen in practice, below which a conversion or write-down is triggered, which could temper the effectiveness of this instrument. Regulatory capital requirements could be undershot even before the occurrence of the trigger events enshrined in the CoCo bond contracts. This would require authorities to intervene in banks' business operations even prior to the contractual conversion or write-down of CoCos. In order to address this issue, the regulatory requirements governing AT1 instruments in the EU should be tightened.[56] In particular, it should be examined how much the mechanical CET1 threshold has to be raised in order to

52 See Financial Conduct Authority, Restrictions in relation to the retail distribution of contingent convertible instruments, 9 December 2016, https://www.fca.org.uk/publications/temporary-product-interventions/restrictions-relation-retail-distribution-contingent
53 See S Avdjiev et al (2017), op cit.
54 Even rating agencies seem to find it difficult thus far to reliably price CoCo bonds. See G Pennacchi, T Vermaelen and C C P Wolff (2014), Contingent capital: the case of COERCs, Journal of Financial and Quantitative Analysis, Vol 49 (3), pp 541-574; A Delivorias (2016), Contingent convertible securities: is a storm brewing?, European Parliament Research Service Briefing, May 2016.
55 See M A Boermans and S van Wijnbergen (2018), op cit.
56 Such an adjustment would also be covered by the agreements contained in the Basel III framework, which do not set any quantitative parameters for the trigger threshold. See Basel Committee on Banking Supervision (2010), Basel III: a global regulatory framework for more resilient banks and banking systems, pp 14-19.

ensure that CoCo bonds have the effect regulators intend – to act as a loss absorbing instrument for banks on a going-concern basis.

The CoCo bond designs currently observable also provide grounds for doubt as to whether these instruments will meet additional expectations. The extent to which, as intended, incentives for banks to improve risk management and monitoring are being set appears questionable. Banks' management could have an incentive to take even more risk, in fact. This is to be feared with regard to CoCo bonds with both a write-down mechanism and conversion with a small degree of dilution.

Moreover, CoCo bonds could also trigger undesirable effects across banks. One key reason is additional linkages within the banking sector and between banks and other institutional investors, which could be created by the holding of CoCo bonds. According to available, albeit patchy information, this cannot yet be empirically confirmed for the EU. Another key reason is the possibility of information-based contagion, which can appear in particular where similar risks and performance patterns of the assets held by individual issuers exist. If a trigger event occurs with one issuer, this can be understood as a negative signal for other banks in the CoCo bond market and beyond. It is consequently conceivable that individual banks' attempt to increase their loss absorbing capital by issuing CoCo bonds could unleash undesirable effects across banks, all the more if the high issue volumes cited in the relevant literature as essential to the effective use of CoCo bonds are actually achieved.

On the whole, the assumed advantages of CoCo bonds over CET1 capital are dubious. It is unclear, for instance, whether the cost advantage of CoCos over CET1 capital discussed in the literature truly exists. Bearing in mind the highly complex nature, and the risks, of CoCo bonds, if correctly valued they could even be more expensive for the issuer than CET1 capital despite the tax advantage. At all events, any cost advantage of CoCo bonds resulting purely from preferential tax treatment compared to CET1 capital and from preferential regulatory treatment compared to straight debt is not sufficient justification for their use. From a regulatory point of view, the primary benefit of using CoCos derives from their ability to absorb losses. As they are currently being implemented, with low CET1 thresholds for conversion or write-down, this is probably not assured. Therefore, regulatory incentives to use CoCo bonds should be examined critically and, in future, be geared more closely to their intended effects. Given the complexity and the possibility of adverse side effects across banks, however, regulatory incentives to use CoCo bonds do not appear appropriate at present. Instead, focusing on CET1 capital is likely to be the more expedient approach in the long term to safeguarding and improving the stability of banks.