

A Greenhouse for Market Discipline: Making Bail-In Work¹¹

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1. Introduction

This essay concentrates on market discipline. We claim that the disciplining role of market pricing has been largely overlooked when constructing the tools and rules that constitute the banking union project. “Overlooking” market discipline does not mean that it has no role to play in the regulatory framework. To the contrary, the disciplining power of markets actually plays the leading part in the script of the banking union project. This leading part is epitomized by the key role of banks’ total loss absorbing capacity, or TLAC, in the regulatory toolbox. Based on the near-universal bailout experience in the crisis years 2007-2012, the new regulatory regime emphasizes the liability of shareholders and junior bondholders. The first losses experienced by any single banking institution are to be borne by them, by the holders of equity and junior debt. The need for funding under tightened private liability conditions

11. This paper has been prepared for the “Capital requirements and Loss Absorption Capacity for Large Banks” Round Table at Bruegel, Bruxelles (held on July 7, 2015), on the occasion of the launch of the Journal “European Economy – Banks, Regulation, and the Real Sector”. We are grateful to Cambridge University Press for their permission to use extracts of our contribution to the volume “Financial Regulation: A Transatlantic Perspective”, edited by Ester Faia, Andreas Hackethal, Michalis Haliassos and Katja Langenbucher, to appear in August 2015. In particular, Section II is an abridged version of parts of the book chapter entitled “Bail-in Clauses”. We would like to thank Margit Vanberg for helpful comments on an earlier draft of the paper. The views expressed in this paper are those of the authors and do not necessarily represent the views of the Central Bank of Ireland or the European System of Central Banks.

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will, or so it is hoped, render the issue conditions of these instruments more responsive to the true risks faced by the bank's business model. This is all in theory. In practice, however, limiting systemic risk and minimizing the occurrence of bailout events is difficult to achieve.

The present text will explain why market discipline is so difficult to achieve, and what can be done to strengthen its role in the decision process. In contrast to most other corporate markets in the economy, banks are faced with rather weak disciplining forces from funding markets.

As a remedy, private bank funding markets need to be fostered and nurtured with great care, in order to ensure the viability of market discipline. In section 2, the paper outlines basic conditions for bail-in to be effective. In Section 3, we compare different entry-point approaches to resolution, and their possible effect on bail-in, in a world with mandatory separation of banking activities. Our major policy conclusion defines a new standard for supervisors: the commitment to monitor (and enforce, if needed) benign 'greenhouse' conditions for bank bail-in.

2. The greenhouse conditions: desirable features of the bail-in tool

Despite some shortcomings, the adoption of the Bank Recovery and Resolution Directive (BRRD) for all European member states and the creation of banking union for the Eurozone, with the establishment of a Single Supervisory Mechanism (SSM) and a Single Resolution Mechanism (SRM), are significant steps forward in the prevention and management of future financial crises.

The BRRD, approved by the European Parliament in 2014, establishes a single framework for the resolution of financial institutions that are "failing or likely to fail".¹⁴ In particular, it grants the resolution authorities various powers, most importantly the possibility to inflict losses on shareholders and bondholders, according to a defined hierarchy, using the "bail-in" tool. While the BRRD introduces a unified framework for the entire EU, the euro zone members established a banking union with the creation of the SSM and the SRM.¹⁵

14. The deadline for the transposition of BRRD into national law was 31 December 2014. However, at the end of May 2015, Bulgaria, the Czech Republic, France, Italy, Lithuania, Luxembourg, the Netherlands, Malta, Poland, Romania and Sweden have failed to implement it into their national law.

15. Please refer to Krahenen and Moretti (2015) for a detailed discussion of BRRD, SSM and SRM.

In the following section, we will discuss three design elements of market-friendly bail-in instruments: conversion (rather than write-downs), trigger (exogenous or not), and loss absorptive ability (managed or not).

a. Market-friendly bail-in design I: conversion

Before even discussing the design features of bail-in tools, it is crucial that these instruments are perceived as *market-friendly*, i.e. clear and easy to price. In fact, the more complex and opaque a product is, the more it becomes difficult to price, and the less liquid the market will become.¹⁶

There is more than one way to implement bail-in: by writing down face value of debt, or by converting debt into equity. In the first case, the regulator depreciates the face value of equity, mezzanine instruments (hybrid, or Tier 2 capital), subordinate and uncollateralized liabilities to the extent required by the capital shortfall, respecting the seniority structure of the liabilities. In the second case, the regulator converts existing debt instruments into equity, generally respecting the waterfall principle, but this may entail limited or unlimited dilution. In the case of unlimited dilution, like in the case of write-downs, conversion of a senior claim happens only after all junior claims have been fully diluted, with zero option value retained by junior claim holders. In contrast, with limited dilution, sequential conversion of more and more senior claims will lead to progressively stronger dilution rates, and even the most junior claimholder will retain a positive option value.

In the presence of uncertainty regarding the ‘right’ moment to trigger the bail-in (which is very likely the case), a bail-in strategy is superior if it generates some risk sharing between old and new residual claimholders of the firm (bank). Therefore, conversions with limited dilution are preferable.

In financial markets, debt instruments with pre-arranged conditional conversion clauses are known under the name CoCos, i.e. contingent convertible debt instruments, and they have been discussed extensively in the literature.¹⁷ As pointed out by the Liikanen Commission¹⁸, these instruments can be successful only if there is enough demand by the private sector and a liquid mar-

16. There is a growing literature on the effects of ambiguity (in the sense of not knowing the probability distribution of a particular asset) on its perceived value by investors. The literature shows that on average, the value of the asset decreases with the level of ambiguity, intransparency, and risk endogeneity.

17. See Flannery (2005), Flannery (2009), and Squam Lake Group (2009) among others.

18. See European Commission (2012b).

ket has developed. As described in Murphy et al. (2012), this requires transparency about the trigger and the conversion, tractability (i.e. ease of modelling, pricing and risk managing), and liquidity of the instruments. However, there might be limitations for potential investors due to mandates that preclude investment in equities.

b. Market friendly bail-in design II: triggers

Earlier proposals for bail-in suggest the use of a trigger based on accounting measures (the Squam Lake Group (2009), D'Souza et al. (2009) and Glasserman and Nouri (2012)).¹⁹ However, others (Flannery (2005 and 2009), Hart and Zingales (2011), Calomiris and Herring (2011) and McDonald (2011)) propose the use of market-based indicators since accounting measures are subject to manipulation, suffer from a time lag, and because they failed to provide any warning signals prior to the onset of the recent financial crisis.²⁰ Martynova and Perotti (2012) show the existence of a trade-off between choosing a market trigger, which produces more conversions, some unnecessary (type II error), and a book value trigger subject to supervisory discretion, which converts too infrequently (type I error) and it thus subject to regulatory forbearance.

Though a market-based trigger²¹ is more transparent than one based on accounting measures, it might lead to multiplicity or absence of equilibria.²² From a practical standpoint, market-based triggers can work only for listed banks, as pointed out in Berg and Kaserer (2014) and Acharya and Steffen (2014). This is by no means a minor concern – even for systemically important institutions – since only 41 of the 124 banks subject to SSM supervision in the Euro area are actually publicly listed.

A last point related to trigger design is the exogenous or endogenous character of the trigger event. Sundaresan and Wang (2011) argue that the regulator would be subject to political pressure and may therefore be reluctant to

19. In particular, D'Souza et al. (2009) suggest the use of the U.S. stress test.

20. See Sundaresan and Wang (2011) for an extensive discussion on the choice of the choice of security on which to place the market trigger.

21. See Hart and Zingales (2011) and Calomiris and Herring (2011) among others.

22. Multiple equilibria incur also in Sundaresan and Wang (2011) and Abdul et al. (2010), while in Pennacchi (2010) a closed form solution is ensured if the trigger relates to the asset-to-deposit ratio.

declare a crisis to be systemic, being wary of false alarms.²³ Moreover, including an element of discretion would increase uncertainty and introduce an element of opacity to the trigger. Berg and Kaserer (2014) survey the recent issuing of CoCo-bonds of European banks and find that observed triggers are based on regulatory ratios, with the ratio between Core Tier 1 capital and Risk Weighted Assets (CT1/RWA-ratio) being the most frequently used trigger.

c. Market-friendly bail-in design III: access restrictions

The credibility of bail-in announcement depends not only on the letter of the law, but also on the deeds of the supervisory authority. In fact, as has been observed many times during the crisis years since 2007, even if the regulator has the intention to implement bail-in, the fear of creating a systemic risk event may prevent imposing losses on bondholders and lead back to the implementation of classical bailout policies.²⁴ Since market participants learn over time, they will anticipate more bailouts to come, should any systemically important bank be on the brink of failure.²⁵

The most obvious reason why a potential bail-in may not be executed in a crisis is the presence of interbank holdings of such subordinate debt. As a response, regulators may insist on not allowing banks to invest in other banks' subordinate debt.²⁶ Conversely, an ideal investor in bank subordinate (bail-in able) debt is an institutional investor, pursuing a long-long strategy, i.e., long-term investments funded by long-term deposits²⁷, such as pension funds, life insurance companies, and private equity funds.

However, a holding restriction for banks is not a sufficient condition for bail-in credibility. Also the confidence that the actual holder of the claim can weather a potential loss in asset value (caused by a bail-in) is crucial. For example, a life insurance company holding high return bail-in debt, should build

23. The reputational cost could be very serious in the case of coincidence of supervisory and monetary policy authority as in the Eurozone and in the UK.

24. See Duebel (2013) for a collection of bailout case studies for the years 2008-2011.

25. See Schweikart and Tsesmelidakis (2013) for an empirical evidence based on price of creditor protection showing that markets firmly believed in bailouts to happen.

26. This has first been suggested as a structural regulatory measure for bank soundness by the Liikanen report in 2012, see European Commission 2012b.

27. Long-long investment companies do not face liquidity funding risk since they do not allow (or disincentivize) investors to withdraw their funds at short notice.

up buffers in good times that mitigate excessive balance sheet damage in a potential bail-in. Such buffers can be built up from the coupon payments.²⁸

d. Market-friendly bail-in design IV: the role of the supervisor

A final point in designing an environment in which government bailouts of banks are only extreme exceptions, and the bail-in of bank creditors is the norm, relates to the key role of the supervisor. These authorities are expected to monitor the state of the bail-in *ability* of banks' subordinate creditors. If bail-in ability is met, then subordinate debt can be priced correctly, largely eliminating the implied funding subsidy inherent in an implicit government bailout guarantee. The supervisor may need to develop the necessary tools required for monitoring bail-in ability.

Examples of additions to the supervisory task list are: monitoring access restrictions and the identity of bail-in debt investors, including risk re-transfers via CDS markets; monitoring loss absorptive ability for bail-in debt investors, including the build-up of sufficiently large loss buffers; monitoring the liquidity of markets for subordinate bank debt instruments.

As a final point, we want to mention the possible integration of bail-in monitoring (the role of the supervisor), bail-in execution (the role of resolution agency), liquidation and resolution (the role national resolution agencies, like FMSA in Germany), and deposit insurance (the role of national deposit insurances and international resolution funds) into a single institution. Such a deposit-and-resolution insurance agency could be modelled after the FDIC (Federal Deposit Insurance Corporation) in the US market.²⁹

28. Note that bail-in debt coupons are expected to be relatively elevated, because of the relatively high default risk they carry, coupled with a high expected loss given default. For example, the junior (CoCo) bonds issued by Swiss banks in 2013 offered an expected return several hundred basis points above that of senior bonds of the same issuer. The coupon, therefore, reflects not only a risk premium but also a loss expectation. The latter should not lead to distributions to shareholder, unless a sufficiently large loss provisioning has been booked in the annual accounts.

29. This is not the place to go into any detail for a proposed deposit-and-resolution insurance agency, but we expect significant synergies to emerge.

3. Structural reform and bail-in: implications for an adequate point of entry

In the previous section, we have discussed the master conditions for bail-in credibility. These are desirable features of TLAC debt instruments that are potentially subject to a bail-in. Preventive monitoring by a concerned supervisory agency is called for. The fact that no supervisor today has added the surveillance of these master conditions to its list of duties may be seen as an alarming sign of unawareness.

Besides bail-in credibility, there is another, and closely related, item on the reform agenda that merits attention: structural reforms, as suggested by the Vickers Commission for the UK in 2011 and by the Liikanen Commission for the EU in 2012. Both proposals aim at limiting the too-big-to-fail phenomenon by facilitating the resolution of large banks. While the UK has opted for ring-fencing the national deposit and lending business of banks (retail and commercial banking), the EU is currently discussing a separation (ring-fencing) of proprietary trading from the rest of banking activities, thereby keeping any potential government guarantee away from a bank's trading on its own account.³⁰

While the question of whether to draw the line between prop trading and the rest of the bank, or between all trading activity, beyond some threshold value, and the rest of the bank is hotly debated among bankers in the EU, the resulting outcome will be characterized by a separation of the classical, universal banking activities into two parts, a trading bank and a commercial and investment bank. In the currently favoured version, all prop trading will either be forbidden outright, as already implemented in Germany and France, or it has to be delegated to a subsidiary institution, the trading bank. In the latter case, the question arises how separation interacts with the new bail-in regime.

Bail-in is indeed affected by a structural separation requirement, as the chosen organizational set-up of the bank is relevant here. To see this, we need

30. The original proposal by the Liikanen Commission (see European Commission, 2012b) recommended against a separate treatment of prop trading on the grounds that it cannot seriously be told from hedging and market making. The resulting type-I and type-II errors are expected to be excessively high (Krahen et al., 2015), rendering the separation of prop trading an inferior policy option. The Liikanen Commission proposed to separate all trading activities, including market making, beyond a threshold size of the trading book.

to distinguish between two types of organizational set-ups, a parent unit and its subsidiary unit(s). The top of the organizational pyramid, the parent, may be a non-operative (a holding company, or Holdco), or an operative company (Opco), issuing equity and debt to investors in capital markets.

Holdco assets consist of equity of its operational subsidiaries. The liabilities of the subsidiaries, in turn, consist of the debt issued to outside investors, plus the equity held by the Holdco. Holdco debt is junior to debt issued at the subsidiary level. Such a setup is commonly found among big international banks in the US, UK, CH, Japan.

The Opco design is typically found in continental Europe (F, GER, E, I). The Opco parent may have a number of equally operative subsidiaries. One difference between Holdco and Opco structures relates to debt seniority. Senior unsecured debt issued by the Holdco is structurally subordinate to any debt issued by its subsidiaries, or the parent company. For Opco structures, in contrast, all unsecured debt issued by the subordinate firms has the same level of seniority (i.e., is *pari-passu*).

The Holdco structure is ideally suited to implement a single point of entry (SPE) concept. SPE refers to the Holdco being the relevant balance sheet for all bail-in activities. No matter where the Opco's are being run, losses at their level are channelled to the holding level, meaning a write down of the former's equity. The Holdco then settles with its shareholders (wiping out equity in this example), and with its debt-holders (reducing TLAC debt position). Based on this scenario, SPE is widely believed to be the best way to implement a bail-in regime today. In a recent paper, Gordon and Runge (2015) review the US experience and recommend the implementation of the SPE model in Europe as well.

The important point is that, because of the subsidiary debt seniority, any loss exceeding subsidiary equity will be covered by Holdco's TLAC debt position. The latter thus serves as a mutual capital account potentially covering losses occurring at any subsidiary.

No such joint liability exists in the case of MPE set-up. If losses at the subsidiary level exceed its own equity, then subsidiary debt is bailed-in. For the parent firm, losses are limited by the total value of the equity held in the subsidiary.

Different loss allocations have implication for the credibility of the bail-in tool. To see this, recall that structural reforms (as laid down, for instance, in

the draft law published by the European Commission in January 2014) are intended to separate particularly risky lines of business, like trading activities on a bank's own account, from normal banking activities deemed less risky, like advisory services, deposit taking, lending to small and medium sized firms, and running the payment system. Separation is intended to fence normal banking activities, for which implicitly (and partially) a government guarantee has been extended, from those activities that should not benefit from such an implicit guarantee. However, under an SPE-regime, significant losses in the proprietary trading book would be channelled upwards, to the Holdco capital accounts.

Assuming the Holdco has limited access to additional funding during a crisis of an individual bank, the loss event experienced at the subsidiary level will carry over to other subsidiaries (or Opcos) under the same Holdco roof. This may happen because the Holdco will have to shrink its assets if it can't raise new equity, engaging e.g. in fire sales. If the loss spillover is significant enough, the entire bank may be in trouble.

Disregarding reputational risk, a same-sized shock under an alternative MPE design will not sink the entire banking firm, as there is no room for loss spillovers among parent and subsidiaries, due to fencing. As a consequence, the MPE model will allocate subsidiary losses that exceed its own capital to its own debt holders, rather than to the Holdco. For this reason, the parent and each subsidiary need to establish a proper bail-in able debt structure, in line with the TLAC requirements.³¹

Therefore, in an SPE world (but not in an MPE world), a fencing of losses against spillovers to parent firms or to other financial institutions requires an MPE approach, implying a ban on internal TLAC, or on synthetic risk mutualization among subsidiaries of the same Holdco.

That said, there are several caveats to consider. First, under the usual assumption of less than perfect return correlation across subsidiaries, the sum of TLAC capital a company with several subsidiaries has to hold in an MPE model exceeds the TLAC capital to be held in an otherwise identical SPE model. The reduced capital requirement in an SPE reflects the insurance effect

31. Fernandez e Lis (2015, this volume) has a related argument in favor of a MPE model, emphasizing the operational resolution problems faced by a bank with subsidiaries in different jurisdictions around the globe.

among a portfolio of firms with less-than-perfectly correlated loss events. Second, in the MPE model, TLAC is allocated at the subsidiary level. As a consequence, funding costs may differ across subsidiaries in the same holding, reflecting stand-alone risk that can be attributed of these subsidiaries.³²

Thirdly, and perhaps most profoundly, the adoption of an MPE approach is seen by some as a fragmentation of the financial system within the European Union or the Euro area. This argument is particularly valid if the formation of bank subsidiaries is primarily along national boundaries rather than functional activities. Therefore, at first sight, MPE seems to encourage a national approach to resolution, and a fragmentation of the banking market in Europe. However, the emerging role of Europe-wide standards for resolution and TLAC management and implementation via Euro area institutions (SSM, SRM) work in the exact opposite direction. The overall effect will hinge upon the extent to which European standards of supervision will effectively override national concerns.

4. Conclusion

In the previous sections, we have described the potential role of a properly designed bail-in debt market for improving welfare in financial markets. This market's primary role is to repair bank risk taking incentives in the direction of improved downside risk consideration.³³ We stress the term market discipline here, in the sense of pricing default risk on the primary market, revealing relevant information on a secondary market, and more generally encouraging debt holders to voice concerns, or to become active in the governance system of banks.

The role of the supervisor in this picture is that of a guard who enforces the rules of the game. She is *not* attempting to be a better risk manager at the level of individual banks than the banks' management teams. Thus, the supervisor will not micro-manage a bank's risk management, nor will she greatly be con-

32. Funding cost differentials among subsidiaries of the same (banking) firm are not necessarily a bad thing; it could actually be a desired outcome of a separation, if incentive considerations in bank risk taking are relevant, as outlined in Krahen (201-3- explaining Liikanen).

33. Even if everything is in place as suggested in this paper, there is the issue of basic (or exogenous) systemic risk in the financial industry. Monitoring systemic risk, and curtailing its extent, its growth, and its possible consequences remains a major additional challenge for the supervisor and the central bank – this issue is beyond the scope of this paper.

cerned with its business model. Instead, the supervisor focuses attention on the quality and quantity of the bank's TLAC position: the credibility of a future bail-in needs to be actively designed and monitored. While bail-in as a possibility is a simple consequence of a legal decree (as in the BRRD or the Dodd-Frank Act), it is not automatically credible, i.e. rationally expected by market participants to be put into effect when needed, unless adequate provisions are in place.

We have discussed such adequate provisions relating to the design of bail-in instruments, in order to make them attractive for investors and to encourage the development of secondary markets.

In all these design features, the role of the supervisor has to be (re-)considered: its main operative objective, in our opinion, should be *to ensure bail-in ability at all times*.

In particular, the banking supervisor, in conjunction with the agency responsible for the SRM-process, will need a clear mandate for checking, on a regular basis, that banks are sufficiently staffed with loss absorbing capital. That is: equity *and* bail-in debt. For both types of loss absorbing capital, the supervisor has to ensure at any time that a necessary bail-in can actually be carried out without the fear of systemic risk repercussions. This requires thorough knowledge of the whereabouts of the equity and bail-in debt positions, i.e. which investor is long in these assets, whether they are located inside or outside the banking system, and whether there is any prospect of re-transfer of risk into the banking system via CDS or other forms of insurance. Furthermore, are those particular investors subject to run risk?

Moreover, a proper bail-in mechanism will be affected by a structural reform of bank business models. In particular, if a separation of banking and (proprietary) trading is sought, then the adoption of a multiple point of entry-model of resolution practice is a consistent solution. A single point of entry-model (SPE), in contrast, will undo the separation in a default situation, and it will therefore also not be credible before a default event.

We conclude by offering an explanation for the term "greenhouse conditions" in the title of this essay. Market discipline, which is widely believed to be a forceful instrument of self-control in a market economy, is apparently dysfunctional in the banking industry, due to the latency of systemic risk and the externality thus created. As a consequence, a reasonable regulator-supervisor is an institution builder. The institution-of-choice is the market for junior

bank debt, or TLAC debt. If the debt market functions efficiently, it will send price signals to management and shareholders of banks, and it will not be distorted by bailout expectation. However, if left unattended, the same junior bank debt market will attract implicit government guarantees, and this be crippled as a market institution.

The term greenhouse refers to the highly artificial nature of such a well-oiled market institution. In this picture, the supervisor will become the gardener whose main role is to nurture the functional conditions of the market as an institution. Today, we are still quite some distance away from a greenhouse market institution. Worse, the regulator-supervisor has not even begun to realize the importance of its new role as a gardener of bank bail-in ability.

As a litmus test of bail-in credibility in Europe, we should expect bail-in to happen once in a while, with the government apparently respecting the rules of the game and thus *not* interfering in a proper bank default and resolution event. If this happens, we should cheer the supervisor, not blame her.

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Want to have a small greenhouse in your yard to grow some veggies? Then use plastic bottles to build one! Not only are you keeping construction expenses to a minimum, but you are also helping save the environment. To build a large-sized greenhouse, you'll need around 1,500 pieces of 2-liter Article by The Owner-Builder Network. 5.2k. Diy Small Greenhouse Cheap Greenhouse Greenhouse Interiors Indoor Greenhouse Backyard Greenhouse Greenhouse Plans Greenhouse Wedding Underground Greenhouse Homemade Greenhouse. Rising greenhouse gas emissions from worldwide food production will make it extremely difficult to limit global warming to the targets set in the Paris climate agreement, even if emissions from fossil-fuel burning were halted immediately, scientists reported Thursday. But they said that meeting one of the targets, limiting overall warming this century to 1.5 degrees Celsius, or about 2.7 degrees Fahrenheit, could be achieved through "rapid and ambitious" changes to the global food system over the next several decades, including adopting plant-rich diets, increasing crop yields and reducing foo In a warmer greenhouse climate, you can test your market for oregano, lemongrass (popular in Thai and Vietnamese cuisine), Bok Choy, and others. Cool weather crops will include arugula, kale, mustard greens, cilantro (coriander), tarragon, fennel, nasturtiums, and peppermint, among others. While choosing an approach to CEA can be challenging, your customers will appreciate it. In most northern climates, this greenhouse should be productive with natural sunlight for roughly 8 months out of the year. Southern regions will be able to enjoy a longer season, but will also have to manage heat and humidity. The crop yields provided here are based on several years of production testing, completed with peer oversight for a doctoral dissertation . Market discipline is the onus on banks, financial institutions, sovereigns, and other major players in the financial industry to conduct business while considering the risks to their stakeholders. It works in concert with regulatory systems to increase the safety and soundness of the market. In the absence of direct government intervention in a free market economy, market discipline provides both internal and external governance mechanisms. Breaking Down Market Discipline. Through the support of disclosures and clear financial reporting systems, market discipline increases the information available to the public and encourages the release of timely data on a company's assets, liabilities, income, net profit or loss, cash flows, and other financial information. b. Market friendly bail-in design II: triggers. Earlier proposals for bail-in suggest the use of a trigger based on accounting measures (the Squam Lake Group (2009), D'Souza et al. (2009) and Glasserman and Nouri (2012)).[7]In particular, D'Souza et al. (2009) suggest the use of the U.S. stress test. In the previous section, we have discussed the master conditions for bail-in credibility. These are desirable features of TLAC debt instruments that are potentially subject to a bail-in.