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2025

Containing Runs on Solvent Banks: Prioritizing Recovery over Resolution

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Cover Page Footnote

We wish to thank Viral Acharya, Charles Goodhart and Sebastiano Laviola (discussant) for their very useful comments. A previous version of this article was presented at the FSB Workshop on Systemic Implications of the Banking Turmoil in Basel; Single Resolution Board Seminar; Strengthening the Resilience of European Banking Sector Workshop in Brussels; Bank of England Seminar; Bundesbank Seminar, CEPR Webinar; 41st EALE conference in Turin. We gratefully acknowledge the comments of all participants. The usual disclaimer applies. A timely recapitalization option requires stronger supervisory powers to activate a timely going concern recapitalization, such as by equity conversion of AT1 CoCo debt. A contingent liquidity measure would be redemption charges activated automatically upon large outflows of uninsured deposits. The goal is to interrupt any self-fulfilling expectation of further outflows. The measure mirrors new SEC norms created for institutional MMFs, the natural benchmark for uninsured corporate deposits. The combination creates a framework for credible interim intervention and a chance to steer solvent banks towards recovery early on rather than settling for forbearance and increasing the probability of resolution and bailouts.

Containing Runs on Solvent Banks: Prioritizing Recovery over Resolution

Edoardo D. Martino¹ and Enrico Perotti^{2,3}

Abstract

The sudden banking defaults in the spring of 2023 proved current prudential norms insufficient to prevent bank distress. Capital and liquidity norms need to be adjusted. The experience also shows how a lack of credible supervisory tools led to forbearance and finally chaotic public bailouts. An intervention gap arises when viable but undercapitalized banks are at the mercy of runs. Once outflows start to escalate, all that is left is to prepare for resolution and assign losses. We call for new Pillar II— that is, activated by the supervisor— stabilizing measures, as contingent capital and liquidity tools.

A timely recapitalization option requires stronger supervisory powers to activate a timely going-concern recapitalization, such as by equity conversion of additional Tier 1 contingent convertible debt. One contingent liquidity measure is the automatic activation of redemption charges upon large outflows of uninsured deposits. The goal is to interrupt any self-fulfilling expectation of further outflows. The measure mirrors new US Securities and Exchange Commission norms created for institutional money market funds, the natural benchmark for uninsured corporate deposits. The combination creates a framework for credible interim intervention and a chance to steer solvent banks toward recovery early on rather than settling for forbearance and increasing the probability of resolution and bailouts.

Keywords: bank recovery, bank resolution, contingent capital, redemption charges

JEL Classifications: G21, G33, K20

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I. Introduction

The key reforms of the Basel III agreements since 2008 had three goals: limit risk incentives, avoid bailouts, and contain spillover (contagion) effects. The first goal was served by stronger Basel III capital and liquidity norms that produced a more resilient banking sector. Bailout and contagion risks were supposed to be addressed by bail-in capital and new Pillar II—that is, activated by the supervisor—powers for capital guidance. Yet the experience with massive bank runs in 2023 imposes new conclusions.

Capital and liquidity requirements need to be recalibrated based on the new evidence. But next to this primary need, there are more specific implications. First, supervisory hesitation to intervene on undercapitalized banks in a timely manner is driven by fears of triggering panics. Regulatory forbearance buys time but ultimately extends value deterioration and increases losses. Second, it has become painfully evident how even at an early phase of distress, there are hardly any (bailout-free) policy tools to contain runs. Finally, the diffusion of social media usage led to an extraordinary acceleration of self-reinforcing panic runs (Cookson et al. 2023). At a time of rising rates and diffused losses on safe assets held in the banking book, a large share of the banking sector faces huge liquidity risk from uninsured depositors with no tools for containment (Jiang et al. 2024). Extensive reforms since 2008 have raised the level of the dams against flooding. However, once high water threatens to run over, there are no remedies (stored sandbags) other than absorbing losses by bailouts.⁴

The key timing of remedial actions on capital is once losses bite into a bank's conservation buffer. The limited tools available in this phase (at best, a suspension of dividends) are hardly ever activated, due to chilling concerns that any public action may lead to self-sustaining runs.

We propose a new framework to prioritize bank recovery over bank resolution, beneficial in several aspects. The main goal is to give solvent but undercapitalized banks a chance to recover early enough, removing the bias toward forbearance. Second, it will improve the credibility of going-concern supervisory powers, prompting more risk-absorbing capital once conservation buffers are about to be breached. Finally, it will ensure that private bail-in requirements are implemented. At the same time, reform proposals should ensure reliable access to own funds for depositors and a transparent process for bail-inable investors. These interim measures should be activated upon specific quantifiable indicators. The trigger may lead to an automatic activation or empower supervisors to do so, with the aim to foster the recovery of viable but undercapitalized banks.

The rest of the article unfolds as follows. Section II describes some visible shortcomings of the current regime. Once capital levels start to deteriorate, there are no credible tools to

⁴ Since 2008, the total amount of bail-in for uninsured bank deposits is zero, in both the European Union and the United States. The notable exception is the Cyprus bank crisis resolution managed by international institutions, where large uninsured deposits banks (mostly foreign) were partially bailed in.

increase risk absorption or control run incentives. We discuss separately the poor incentives resulting from excess leverage and forbearance (Martynova, Perotti, and Suarez 2022) and the run incentives created by unconditional sequential service (Diamond and Dybvig 1983; Matta and Perotti 2024). Section III proposes two key interim measures on capital and liquidity, namely (a) a credible regime for going-concern recapitalization and (b) the introduction of contingent redemption charges, automatically triggered by uninsured deposit outflows. Section IV proposes the principles guiding the activation and calibration of these interim measures. Section V compares these proposals with other reform options in terms of risk allocation and risk incentives. Section VI concludes.

II. A Regulatory Blind Spot

Several reform proposals since March 2023 have focused on robust ex ante prudential measures. On the one hand, higher capital and liquidity norms (Admati and Hellwig 2024); on the other hand, an expansion of deposit insurance coverage (Heider et al. 2023), mirroring the de facto bailout of all the Silicon Valley Bank (SVB) uninsured depositors—accounting for 94% of the bank’s deposit base.

Higher buffers are most effective but hard to implement; public insurance reduces runs only at high fiscal costs and moral hazard incentives. We argue that higher capital and liquidity buffers are indispensable. Yet it is also essential to strengthen interim measures aimed at preventing unnecessary resolution. The current recovery and resolution framework is not credible and has poor preventive effects (Martino and Parchimowicz 2021; Martynova, Perotti, and Suarez 2022). Too often, resolution reform has been seen narrowly as ensuring orderly liquidation, a ready plan for smoothly allocating gone-concern losses. This approach leans toward a passive acceptance of insolvency risk and leads to excessive bailouts.

We argue that a new emphasis on preventive measures is crucial to avoid potentially viable banks’ sliding into insolvency once undercapitalized. At present, we have a blind intervention spot: once distress starts, we have no credible tools to promote recovery or contain run incentives, so outflows can easily escalate into self-fulfilling runs.

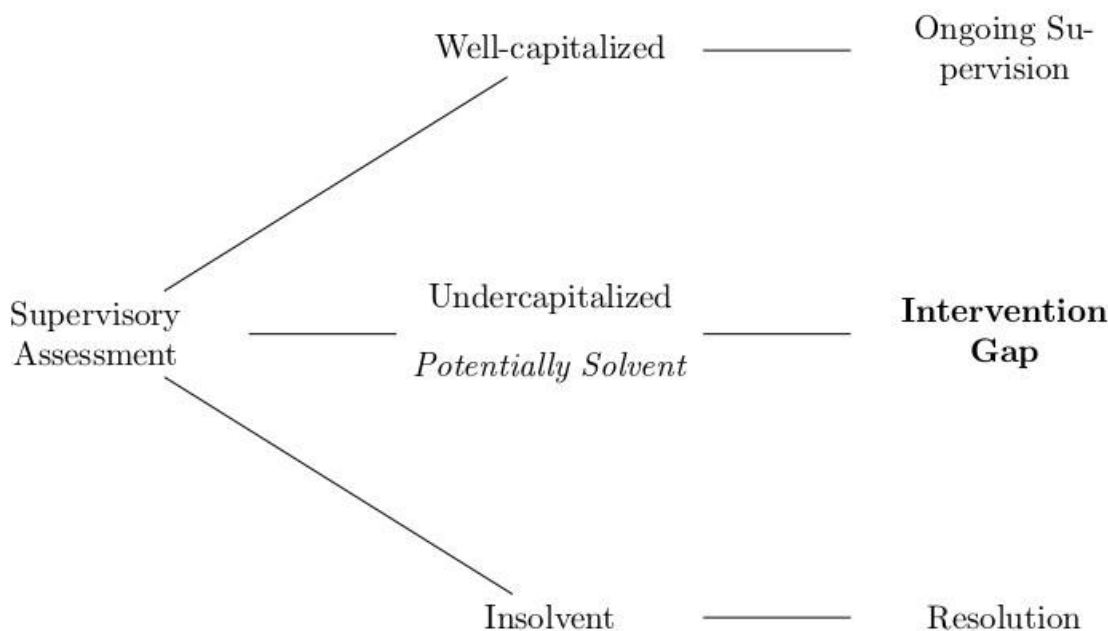
Consider the current sequence of Pillar II intervention steps. A stress test evaluation may lead to conclude that the bank is insolvent, or potentially solvent but undercapitalized (Figure 1). In the first case, the supervisor must put in resolution the insolvent bank; the second case calls for a path to going-concern recapitalization. However, at present, there are no effective tools to support such a recovery, short of public risk absorption. We call this a serious intervention gap.

Notionally, once supervisors become aware of bank-specific losses, they are empowered to initiate a Pillar II “capital guidance process,” indicating capital surcharges based on the result of stress tests.⁵ However, bank shareholders are under no legal obligation to contribute new

⁵ This process is organized differently across jurisdictions, with different consequences in case of noncompliance.

equity, though they face the risk of insolvency. The main Pillar II capital tool is to restrict the right to distribute dividends. Even this limited step is avoided as supervisors fear triggering runs.

Figure 1: Bank Status and Regulatory Practices



Source: Authors' elaboration.

We discuss sequentially the risk incentives resulting from excess leverage and forbearance (Martynova, Perotti, and Suarez 2022) and the run incentives created by unconditional sequential service (Diamond and Dybvig 1983; Matta and Perotti 2024).

The Bank Recapitalization Game

Once supervisors recognize a capital shortfall under an adverse scenario, they activate the regime of capital guidance, demanding an appropriate capital increase.⁶ The bank complies via retained earnings or a private recapitalization. However, bank shareholders often resist retaining risk-absorbing equity as long as dividends are still allowed. They may claim that maintaining their payout is necessary to avoid sending adverse signals and fearing the stigma attached to such an adverse public signal (Gorton and Ordoñez 2020). For the same

⁶ Capital surcharges reflect microprudential buffers and bank-specific guidance, as well as on macroprudential surcharges.

reason, supervisors postpone suspending payout rights (Gambacorta, Oliviero, and Shin 2023).⁷

Unresolved losses lead easily into a phase of debt overhang, where private incentives to recapitalize deteriorate further. An undercapitalized bank with a viable business model may well be solvent once its deposit franchise (charter value) is recognized. The challenge is that private refinancing incentives are much weaker when forbearance is expected, leading to a strategic waiting game where bank shareholders, managers, and regulators seek to buy time hoping to induce others to shoulder (increasing) losses. In this “capital forbearance” game (Martynova, Perotti, and Suarez 2022), bank shareholders have incentive to play for a lucky recovery or public support.

The lack of a credible measure leads to an “intervention gap” until resolution (Cecchetti and Schoenholtz 2023). Supervisors hesitate to take actions indicating weak bank solvency as they fear a loss of confidence (Ahnert and Georg 2018). They are left with exerting discreet “moral suasion” (sending increasingly stern letters demanding recapitalization) and finally declaring the bank insolvent. Bank investors can buy time to “gamble for resurrection,” with poor risk incentives leading to a steady loss of value. As it became clear in the period before the March 2023 runs, once the bank enters a phase of elevated debt overhang, a private recapitalization becomes unrealistic while risk incentives deteriorate rapidly.

Unfortunately, in this phase, time is not on the side of regulators. There are few intervention tools, and fears of triggering runs are by now well justified. Forbearance serves as a delaying tactic but discourages private recovery actions. In the absence of new risk-absorbing capacity, it is ultimately a gamble that leads to even larger expected fiscal losses even for an initially solvent but undercapitalized bank.

Supervisors are currently confronted with two suboptimal options. Available tools (such as a suspension of dividend payout) offer little immediate relief while sending a signal about bank losses, thus triggering a run. On the other hand, prolonged forbearance worsens capital deterioration, increasing the probability of a run at a rising fiscal cost (Figure 2).

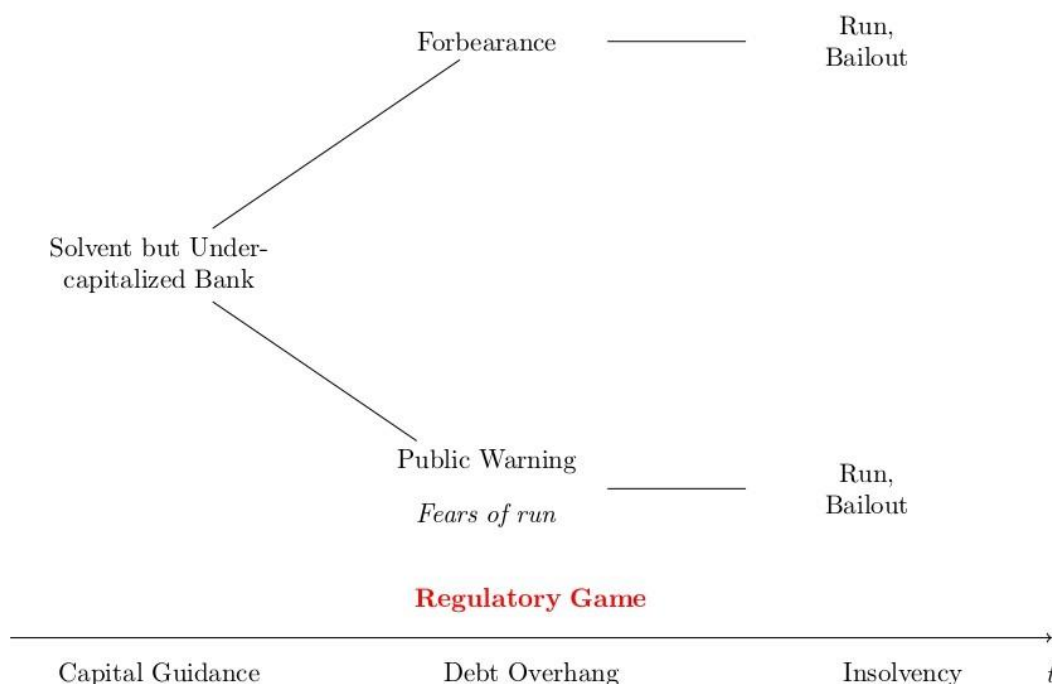
The dynamic we describe in this section stands also when considering alternative tools whereby undercapitalized banks have the possibility to seek help to prompt recovery. Especially in the US, discount windows represent the most common of such tools. However, discount windows are rarely used by banks because of their opt-in design, which requires banks to actively seek help from the Federal Reserve, sending a public signal to the rest of the market. Banks usually shy away from the stigma attached to such a public signal (Armantier et al. 2015; Ennis 2019).

In the upcoming sections, we detail our proposals aimed at timely recovery over resolution and avoiding forbearance. In Appendixes A and B, we detail the background situation

⁷ After Deutsche Bank faced a legal restriction to pay a single coupon on its CoCo debt due to insufficient book equity, supervisors responded to a fall in bond prices by pressing for a revised legal interpretation of minimum requirement for own funds and eligible liabilities (MREL) norms to allow the payment, and in the same year allowed the bank to pay out a dividend.

informing such a proposal, discussing the key insights from the European Union (EU) experience with contingent convertible (CoCo) debt as well as the recent Credit Suisse additional Tier 1 (AT1) conversion.

Figure 2: Intervention Gap and Regulatory Game



Source: Authors' elaboration.

III. Design and Complementarity of Interim Measures

We turn to discuss specific contingent tools to protect bank capital and liquidity in early distress. We propose an early distress measure on capital and an acute distress measure on liquidity. We first detail the necessity to make going-concern bail-in of AT1 instruments credible and effective. Thereafter, we argue that measures to contain uninsured runs should instead be automatic, as they address a core stability issue. Appendix C details the economic and legal definition of "solvent but undercapitalized" banks, necessary to legitimize interim recovery tools.

On the capital side, we propose strengthening the Pillar II mandate on the going-concern loss absorption of contingent convertible debt. On the liquidity side, we propose introducing simple liquidity fee rules (that is, contingent charges) on uninsured deposits in case of large outflows. The two measures complement each other, allowing qualifying banks to recover without public funding while minimizing the risk of unnecessary runs.

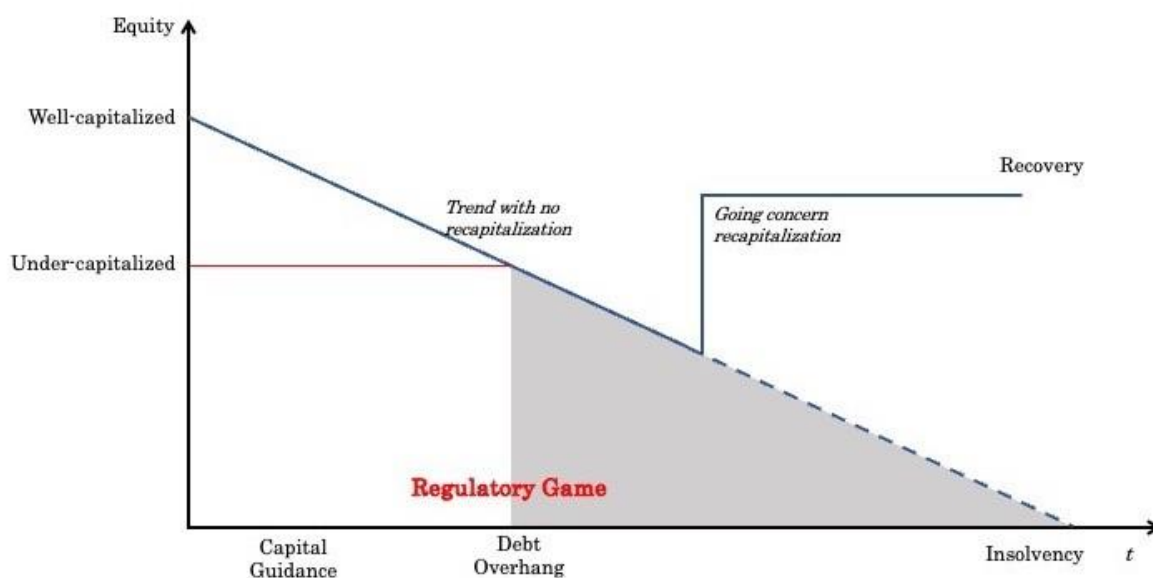
Going-concern Bail-in

Any reform aiming at a credible preventive recapitalization requires two steps. First, an increase in capital norms to be mandatorily satisfied by a minimum of CoCo capital, convertible on a higher trigger than currently admissible—at least above the minimum capital conservation buffer of 7% of book equity over risk-weighted assets. Second, it will involve an enhanced Pillar II mandate to both enable and force authorities to activate conversion, upon a supervisory assessment that the bank is undercapitalized but solvent. A timely reduction in leverage will grant immediate breathing space and remove run incentives. Such a preventive recapitalization can be seen as a form of “*in loco bancaruptae*,” a going-concern recapitalization that does not require default.

An efficient conversion process may be delayed too long by concerns that it may serve as a coordinating event for self-fulfilling runs. Accordingly, we turn to outline a complementary and necessary component of our reform proposal to favor recovery over resolution.

Figure 3 depicts the effect of going-concern recapitalization, timed when new private risk absorption is not forthcoming due to debt overhang. For such a tool to become credible, the regulatory norms and contractual feature of AT1 contingent capital have to be redefined to ensure that the going-concern loss absorption will happen promptly.⁸ This requires resolving the current legal ambiguity over the executability of the conversion trigger ahead of default.

Figure 3: Capital Adequacy and Going-concern Bail-in



Source: Authors' elaboration.

⁸ See Appendixes A and B for details on the EU and Swiss experiences and failures with AT1 going-concern loss absorption.

There are legitimate concerns that any decisive going-concern bail-in will require equally credible tools to contain subsequent panic, potentially generating runs. However, this is not a state of things that we should passively accept. Rather, the interim recapitalization through the going-concern bail-in of CoCos should be made credible by complementary reforms addressing the panic concerns. The following sections discuss the key nodes of uninsured deposit outflows and how redemption charges can contain runs. This, in turn, makes going-concern bail-in more credible.

Run Incentives

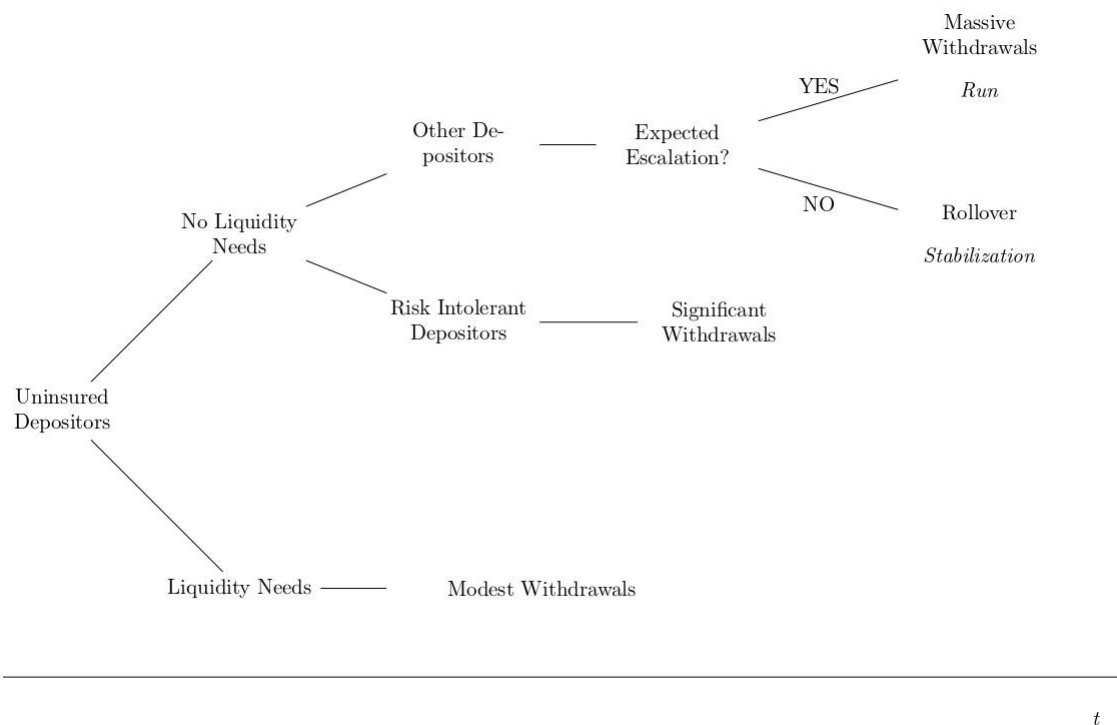
Typically, a run does not come completely unannounced. Looking at US banks that failed from 1934 to 2022, Ohlrogge (forthcoming) shows significant outflows of uninsured deposits in the four years before the failure, showing how runs should be understood as a dynamic process. Unfortunately, recent runs have proven much faster, as they were driven by intense social media concerns leading to a fulminating run coordination. Such a context virtually renders current supervisory options useless, imposing a strict blackmail for fiscal bailouts of uninsured claims.

Yet too often, a bank run is seen as a black box, a self-escalating process that cannot be contained once it is triggered. This is a simplistic and self-defeating view. To be able to deal lucidly with this threat, it is important to break down the dynamics of run incentives. The key determinant is the net rollover payoff, the difference between the expected value of joining the queue and rolling over (Matta and Perotti 2024).

Runs tend to start after some adverse signal induces depositors with an immediate need for liquidity to withdraw. These early outflows include investors that front-run and extremely “risk intolerant” depositors who will not accept even an infinitesimal risk of default. But the key issue is whether the larger group of depositors with no cash needs becomes concerned about a full escalation. Under current norms guaranteeing unconditional sequential service of all depositors, there are no exit costs. Therefore, the net rollover payoff if many choose to withdraw is negative even for solvent banks. Once the expectation that others will run sets in, withdrawing becomes a one-way sure bet, triggering a full-blown panic. This is the classic self-fulfilling logic of panic runs, which may take down even solvent banks (Diamond and Dybvig 1983).

Thus, a decisive intervention introducing some conditionality to the sequential service of uninsured depositors may be effective in taming the perception of an escalation in outflows. At present, bank supervisors (unlike money market mutual fund supervisors) have no tool to stop a run in progress.

Figure 4 depicts the progress of uninsured outflows, at first building slowly then finally escalating into a self-fulfilling run. The key inflection point is when depositors with no immediate liquidity needs start to fear a large escalation.

Figure 4: Withdrawal Stabilization through Redemption Charges

Source: Authors' elaboration.

Containing Escalation of Outflows

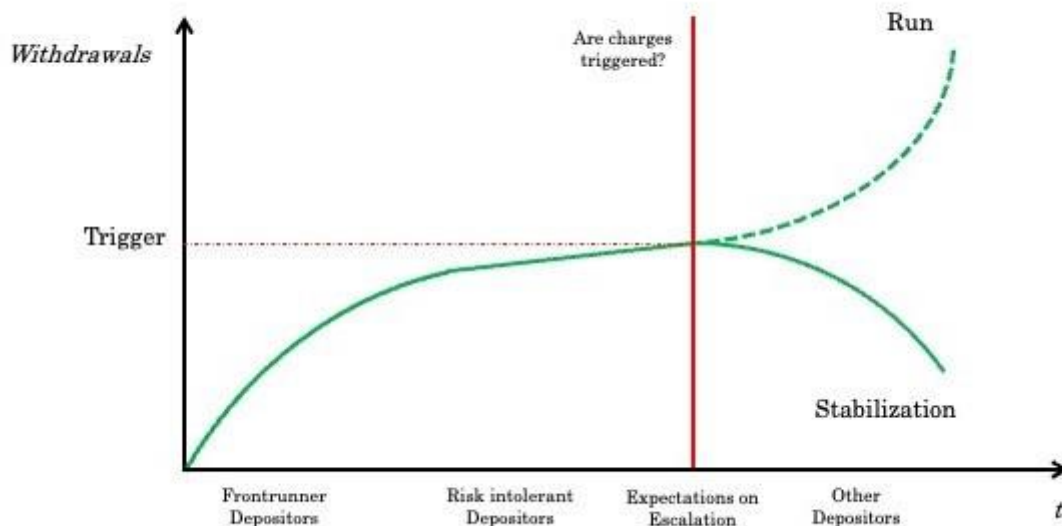
It is essential to protect bank liquidity upon large outflows of uninsured deposits. Next to higher reserves for uninsured deposits, it is important to introduce interim measures to address the problem when it presents itself. We propose introducing “liquidity pricing” in the form of flat redemption charges upon large withdrawals. This procedure allows savers and firms to withdraw anytime, suffering only a minor discount to face value in extreme events.

The approach follows the money market fund (MMF) reform after the Global Financial Crisis of 2007–2009, revamped in March 2020. MMFs had been the main destination for corporate cash pools, so they are a natural benchmark for corporate needs. The 2016 MMF reforms focused on slowing down outflows by temporary suspensions. Funds were mandated to impose such gates upon rapid outflows to avoid encouraging front-running, once liquid reserves were almost exhausted. This regime was functionally similar in the US and the EU. However, in March 2020, money market fund managers proved reluctant to impose gates. Instead, they sold less-liquid claims to avoid triggering a mandatory suspension of redemptions, leading to fire sales. Lack of an automatic trigger leads to failure to suspend redemption in time, undermining the credibility of gates (Matta and Perotti 2024). A similar issue is the reluctance of banks to benefit from discount window lending, fearing stigma and the related adverse reaction of other market participants.

After a long debate, the US Securities and Exchange Commission (SEC) decided to eliminate gates, which were seen as too disruptive. In their place, the new norms aim at containing runs by introducing the equivalent of “congestion charges.” Investors now regain unconstrained access to their funds even in a run, but at a small discount from net asset value. This contingent penalty is automatically triggered by large outflows, thus avoiding a discretionary choice by the fund administrators. Allowing withdrawals even in a run but at a discount ensures access to own funds but also serves as a reliable brake on run incentives, protecting those who do not run.

Imposing temporary redemption charges on uninsured deposits outflows targets the one-sided incentive to withdraw at par, directly reducing run incentives. Critically, charges may also shift expectations of further withdrawals by others, avoiding escalation driven by fear of dilution rather than solvency concerns (Matta, Oostdam, and Perotti, forthcoming). Contingent charges serve as a Pigouvian tax on withdrawals with no liquidity needs, as they internalize (and therefore eliminate) the strategic complementarity they may cause (Perotti and Suarez 2011). Full swing pricing removes run incentives driven by dilution risk, since illiquidity is fully priced. However, the level of charges should not be so large as to create difficulties for those with authentic liquidity needs. Allocating revenues from charges to all unpaid depositors after default enables to reduce run incentives even for moderate level of charges (Matta, Oostdam, and Perotti, forthcoming).

Contingent charges will not (and should not) alter the behavior of depositors with immediate liquidity needs. Their role is to reshape the response by depositors with no liquidity needs and stop the risk of a self-fulfilling escalation (Figure 5). Charges aimed at discouraging the escalation of run incentives still support the principle of unconditional access to liquidity, at a modest price in distress times.

Figure 5: Depositors' Reaction to Adverse Information

Source: Authors' elaboration.

Collateral pre-positioning represents a widely discussed alternative as a mean for banks to ensure against runs. However, such practice is characterized by operational frictions (McLaughlin 2024). Moreover, the fear of stigma for large pre-positioning prevents banks from making use of this opportunity (Gorton, Ross, and Ross 2024). This is in line with the arguments we developed in this article, as both banks and supervisors do not want to send public signals early on so that forbearance and delay remain the dominant strategy.

Resolving the Regulatory Gap

An automatic stabilizing tool that discourages sudden outflows will reduce concerns that public measures may lead to inevitable escalation. This increases the effectiveness of capital-related interim measures and reduces the incentives to forbear. Both measures represent a form of preventive partial bail-in that will preserve going-concern value for solvent intermediaries.

Effective interim measures can change the perverse dynamics discussed in Section II. Figure 6 depicts the key nodes for a solvent but undercapitalized bank when recovery measures are in place.

The key insight is that once effective contingent tools are available, the supervisor has a credible alternative to forbearance and can be firmer in promoting a timely private recapitalization.

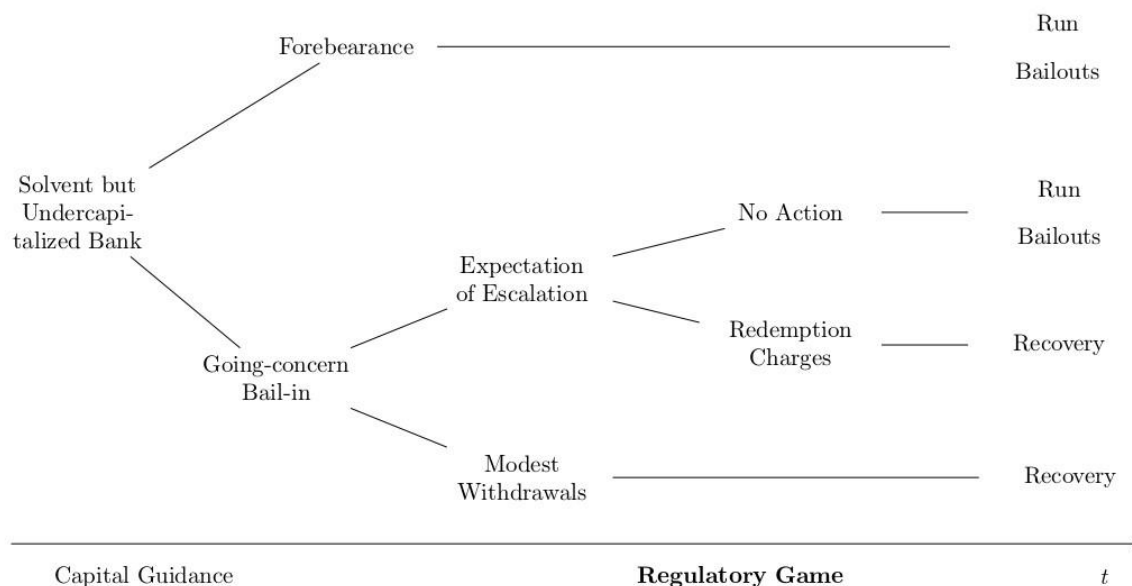
Contingent charges should target depositors with no liquidity needs and no extreme risk intolerance, to reshape their incentives to withdraw and stop the risk of a self-fulfilling

escalation. This happens through both a direct and indirect channel. First, the incentive to stay (net rollover risk) is increased by the temporary exit cost imposed by the charge. Moreover, charges clearly discourage immediate exit by everyone, reducing the expectation that other depositors will be inclined to front-run to avoid dilution. As depositor fears about escalation subsume, charges imposed at the critical inflection point can reverse the self-fulfilling prophecy.

Therefore, charges appear superior to gating when immediate access to liquidity is unconditionally more important than absolute safety, as is likely the case for corporate deposits. Charges eliminate the inaction problem of gates that is driven by the fear of stigma as they apply automatically. Conversely, they overcome the forbearance incentives, increasing the credibility of the measure and reducing the risk of self-fulfilling runs.

To make sure the imposition of charges is effectively timed, daily liquidity disclosure to the supervisor is quintessential. The ideal trigger should be automatic and based on actual outflows, rather than any measure that may be subject to discretionary choices by bank management. In addition, it is prudent to stipulate a secondary regulatory trigger, to be based (just as in the case of CoCo conversion) on a supervisory assessment that the bank is in principle solvent. This allows supervisors to fill the regulatory gap.

Figure 6 sketches the possible responses to a potentially solvent but undercapitalized bank run. Currently, supervisors can only forebear or decide to voice their concerns about the bank status. Both options are likely to ultimately trigger runs and consequential bailouts. On the one hand, forbearance makes the capital deterioration continue up to the point when an adverse piece of news triggers the run. This was the case for SVB and, in part, Credits Suisse. On the other hand, raising public concerns and possibly triggering recovery measures such as going-concern bail-in would be helpful but remains currently not viable because of panic concerns.

Figure 6: Interim Interventions Favoring Recovery

Source: Authors' elaboration.

Our proposals fill this regulatory gap. The supervisors will be entrusted with enhanced Pillar II powers, up to the performance of a going-concern bail-in. This early and effective move is made viable by the contingent redemption charges that are activated upon large withdrawals. Although awareness of contingent charges may lead to some earlier outflows as some depositors prefer front running, their activation will discourage escalation.

The combination of interim measures on both capital and liquidity provides the supervisor with viable tools to ensuring the recovery of solvent but undercapitalized banks.

IV. Prompting Recovery with Interim Measures

What are the appropriate thresholds to trigger going-concern bail-in and liquidity charge? How can we ensure that interim measures are used in a legitimate, effective, and proportionate manner? These questions are crucial for our proposal and for the bank prudential framework at large. In this section, we offer preliminary reflections on both questions.

Principles for the Calibration of Interim Measures

Interim measures should be triggered upon signals justifying the activation of these measures. This makes sense from both an economic and a legal perspective. Figure 7 displays four quantifiable signals that should legitimately trigger interim measures to prompt the recovery of solvent banks.

Figure 7: The Activation of Interim Measures

Signal	Level of the trigger	What is triggered?	Actions
High deposit outflows	Once 5 % of uninsured deposits leave in one day	Redemption charges	Automatic application of a 3% flat charge
			Discretionary power to the supervisor if the bank fails to act
Stress-test result	Severe shortfall in the adverse scenario	Supervisory evaluation on bank viability	If bank deemed insolvent – Resolution
	Any shortfall in the baseline scenario		If deemed viable but undercapitalized – aim at recovery 1) current Pillar 2 tools 2) new power to trigger CoCo Conversion
Market Value	Sharp drop in share price to low valuation	Supervisory evaluation on bank viability	If insolvent – Resolution
	CDS spread increase		If solvent but undercapitalized undercapitalized – aim at recovery 1) current Pillar 2 tools 2) new power to trigger CoCo Conversion
Book equity level	Minimum Capital (4,5%) + Capital Conservation Buffer (2,5%) + Other buffers & bank-specific charges	Supervisory evaluation on bank viability	If insolvent – Resolution
			If solvent but undercapitalized – aim at recovery 1) Automatic CoCo Conversion

Source: Authors' elaboration.

“Daily outflows” represents the key signal for triggering redemption charges. These are targeted at stopping unnecessary escalation, so they must be automatically triggered once the level of outflows is excessive. “Daily outflows” is a strong signal that is easy to measure as long as banks appropriately and timely disclose it to the supervisor. Charges on panic redemptions, such as the fees imposed by the SEC on MMF excess outflows, should be activated automatically to avoid any credibility issue. We argue that they are best intended to support recovery for viable banks. Yet they should be seen as legitimate market stabilizers for any bank, even ahead of a declaration of gone-concern resolution.⁹

To ensure its timely activation, banks must disclose daily information on outflows to the supervisor (at a much higher frequency than to the market). The supervisor should activate the redemption charges if the bank fails to do so in response to high outflows. As charges will apply to excess withdrawals on any bank, they should be seen as market stabilizers without implying a supervisory assessment that the bank is viable.¹⁰ Otherwise, depositors bailed in after default could claim legal recourse against the supervisory action as misleading them.

We propose the same calibration that the SEC designed for US MMFs. Charges are triggered upon the daily withdrawal of 5% of uninsured depositors. Once this contingency materializes, a flat 3% charge applies. In the design of the measure, it is best to steer away from more refined and dynamic calibration mechanisms, such as swing pricing—where the charge is contingent on the liquidity of banks’ assets. Its complexity does not fit the complex nature of banking and would jeopardize the effectiveness of the interim measures.

⁹ Once the bank is declared insolvent and put in resolution, unpaid depositors may have some precedence on accumulated charge revenues.

¹⁰ Redemption charges are not an arbitrary imposition on an asset, rather a form of congestion charge legitimized by public interest in market integrity.

How should the revenues generated by charges be used? Given their purpose, they should be directed primarily at reducing run incentives besides increasing solvency. We propose that charges be collected in a segregated account. If the bank does not recover and gets into resolution in the following 30 days, the account balance should be used to mitigate the losses of uninsured depositors who did not withdraw—a longer maturity may be also justified.¹¹ Otherwise, the account balance should be fully released to further reduce the bank leverage.¹²

The activation of going-concern capital bail-in is more delicate to design and calibrate as it is justified only for potentially solvent banks. Banks deemed insolvent, thus with no recovery prospects, should go as soon as possible into resolution. We consider three different imperfect measures triggering going-concern bail-in, and more generally Pillar II recovery measures.

We first consider the outcome of a supervisory stress-test. This represents a precise but infrequent measure. It can detect early deterioration of banks' viability. Because of these characteristics, we propose that a serious shortfall in the adverse scenario or any shortfall in the baseline scenario should trigger an assessment on the bank's viability. If the bank turns out to be solvent, the supervisor should be empowered with additional Pillar II tools for prompt recovery. This comprises current Pillar II tools, including payout restrictions, and the new, additional, power to trigger the CoCo conversion.

Signals from stress testing should be complemented by warning signals provided by market value indicators (Acharya, Kulkarni, and Richardson 2011). Although regulators are reluctant to use automatic market value triggers as they are prone to be distorted, they should be considered as significant information. Adverse market signals in the form of a sharp drop in share price or a jump in credit default swap spread should trigger a supervisory evaluation and empower the supervisor to prompt recovery measures (Hart and Zingales 2011).

Finally, the traditional measure of book equity provides a notionally correct but in practice opaque signal. As it is prone to accounting manipulation, it will not signal capital deterioration in time. Given its role in capital regulation, book equity should retain a complementary role. We propose retaining the automatic trigger based on book equity in line with current practice, provided its threshold be raised considerably to ensure that conversion will support the recovery of a solvent but undercapitalized bank.

The regulatory trigger should be set at least at 7% of book equity. This equals the core equity requirement of 4.5% plus the capital conservation buffer of 2.5% that applies to all banks at all times and is designed to ensure that banks build up capital buffers to withstand periods

¹¹ This is consistent with the idea of reversible rewards, developed in Ben-Shahar and Bradford (2013).

¹² In this case, accounting norms should make sure that the revenues stemming from charges are not categorized as “distributable items” so that these effectively accrue to capital and cannot be channeled to shareholders.

of stress. If the bank is systemically important or is deemed particularly risky, the AT1 bonds should carry a correspondingly higher conversion threshold at issuance.

A Recovery Procedure to Ensure Legitimacy and Effectiveness

How can we be sure that interim measures we propose will be able to break the forbearance incentives? And how can we be sure that such intrusive measures in the management of solvent corporations are used in a legitimate and proportionate way?

At first sight, these two questions point at different things; however, at a closer scrutiny, they turn out to be intrinsically related. The supervisor will decide to act only if its powers are widely perceived as legitimate, to avoid *ex post* challenges and loss of reputation capital. Moreover, an attentive design in terms of legitimacy and proportionality helps ensure that only solvent but undercapitalized banks are targeted by recovery measures.

For these reasons, we propose to design a new formal recovery procedure. A bank that is declared solvent but undercapitalized should enter the procedure in which the supervisor has enhanced powers to prompt recovery. These powers should include the AT1 going-concern bail-in, to ensure deleverage, as well as other supervisory powers related to the risk profile, business model, and risk management of the bank.¹³

To understand the rationale of the bank recovery procedure, it is useful to draw a functional comparison with the existing procedures to handle distress in nonfinancial firms. Figure 8 summarizes this functional comparison.

First, insolvent firms can be liquidated according to a judicial procedure to ensure the maximization of creditors' recovery. The US Chapter 7 procedure represents the most paradigmatic example. For banks, this is equivalent to orderly liquidation.

Figure 8: Distress Procedures for Nonfinancial Firms and Banks

Nonfinancial Firms	Banks
Chapter 7 – Liquidation	Orderly liquidation
Chapter 11 – Reorganization	Resolution
Private (<i>prepacked</i>) workouts	<i>Recovery</i>

Source: Authors' elaboration.

Second, if there is residual going-concern value in the firm, many legal systems favor reorganization procedures, aiming at striking a balance between creditors' rights and the

¹³ Some of these powers are already allocated to the supervisor but are rarely used because of the forbearance incentives that we discuss in Section II. A formal recovery procedure will ensure that these powers are made effective.

preservation of such a going-concern value. The US “Chapter 11” procedure can be taken as an example. For banks, this is equivalent to resolution procedures.

Third, firms that are solvent but face significant distress and debt overhang may want to engage in prepackaged private workouts, engaging in debt restructuring ahead of insolvency (Gertner and Scharfstein 1991). The existence of this possibility is valuable as it prevents the deterioration of going-concern value. However, this is completely unavailable for banks because of the runnable nature of their liabilities. Our proposal to establish a recovery procedure aims at devising a tool that is functionally equivalent to private restructuring, offering a genuine possibility of recovery to undercapitalized banks.

The detailed design of such a recovery procedure is beyond the scope of this article. Here, we limit ourselves to set down three key principles of a credible and legitimate recovery procedure:

- (1) Legitimate activation: The supervisor should have the mandate to initiate recovery upon the occurrence of reliable signals, such as large outflows, stress test results, market-value indicators, auditors’ assessment, book value of equity. Recovery can initiate if the “solvent but undercapitalized” status of the bank is signaled by more than one of these heterogeneous indicators.
- (2) Short-term mandate: The supervisor should not act as de facto management, to ensure proportionality and limit legal risk. Therefore, we propose a short recovery window of 30–60 days.
- (3) Availability of limited emergency liquidity assistance (ELA): This will ensure the credibility and feasibility of the recovery. This is in line with the central bank mandate in liquidity provision as the recovery should take place far from the point of nonviability. At the same time, providing ELA also reinforces the legitimacy of the additional recovery powers granted to the supervisor.¹⁴

V. Comparing Solutions by Risk Allocation

The experience of March 2023 has reignited the debate over banking regulation reforms, such as widening deposit insurance or higher capital and liquidity requirements. These proposals focus on ex ante solutions, the equivalent of increasing the height of dams of expanding flood reservoirs. We argue that such reforms do not entirely capture the dynamic evolution of bank distress that we depicted in the previous sections, and that contingent, interim, measures (the storing of sandbags by the dam) may need more attention.

¹⁴ This is in line with the experience of Credit Suisse, where the Swiss Financial Market Supervisory Authority was empowered to write down AT1 CoCos because of the ELA granted to the bank. See Appendix B for further details.

Figure 9 summarizes the main reform options including state-contingent options and highlighting how the allocation of risk affects moral hazard and run incentives, trading off liquidity, capital, and fiscal costs (Perotti 2023b).

Figure 9: Potential Reforms to Strengthen Deposit Stability

Type of Reform	Allocation of Risk	Effect on Insolvency Risk	Effect on Liquidity Risk	Effect on Risk Incentives
<i>Ex ante Measures</i>				
Higher Capital Norms	<i>Investors (High bail-in)</i>	<i>High at all times</i>	<i>Positive, indirect</i>	<i>Very Positive</i>
Deposit Insurance	<i>Taxpayers (bailouts)</i>	<i>Ambiguous</i>	<i>Highest Reduction</i>	<i>Very Negative</i>
<i>Interim Measures</i>				
Going-Concern Recapitalization	<i>Investors (High bail-in)</i>	<i>High (if the trigger is effective)</i>	<i>Positive, indirect</i>	<i>Positive</i>
Redemption Charges	<i>Uninsured Depositors (Modest bail-in)</i>	<i>Positive but limited</i>	<i>High and Positive</i>	<i>Positive</i>
Mandatory Collateral Pre-positioning	<i>Banks Taxpayers (indirectly)</i>	<i>Ambiguous</i>	<i>High and Positive</i>	<i>Moderate</i>

Source: Authors' elaboration.

Deposit insurance and higher capital norms have the strongest effects and highest cost and would face extensive resistance. The advocacy for stricter capital norms is as noble and well-grounded as politically unviable. The outcome of the Basel Endgame negotiations and the likely impact of the new Trump administration demonstrate the complexity of such an ambitious goal (Davies 2024).

On the other side of the “ex ante” measure spectrum, the idea of full deposit insurance gained support in both academic and policy circles in the aftermath of the SVB and Credit Suisse collapses (FDIC 2023, 44). Full deposit insurance was offered for SVB’s uninsured depositors, accounting for a staggering 94% of the SVB deposit base, on an ad hoc basis after the “financial stability” exception was triggered. This, indeed, stopped the run but reinforced bailout expectations on all banks. Based on our analysis, the impact of expanding deposit insurance to currently uninsured depositors would have extremely negative effects on risk incentives, resulting in ambiguous effects on the bank’s insolvency risk. Excessive risk incentives and related bailout expectations would make recovery impossible.

Interim measures targeted at going-concern preservation and recovery may be embedded as prompt responses containing the escalation of runs. This calls for solid pre-resolution

regulatory powers to activate pricing and gating in response to uninsured runs on banks deemed solvent.

In any run, allowing outflows at par value directly dilutes those who do not to withdraw. As a result, once outflows start, all depositors have an incentive to run if they expect others to do the same. To de-escalate run incentives, it is critical to penalize or slow down rapid outflows at the right time. Thus, the choice of the precise volume of outflows that would activate the temporary charges is quite an important calibration. Just as in the case of contingent conversion of AT1 debt, it is highly advisable to introduce a regulatory trigger that may be activated at an early stage when banks deemed to be solvent become exposed to rumors that may trigger an escalation. Comparable norms have already been applied to money market funds. This is a significant precedent since MMFs were the main historical destination of corporate cash pools and can serve as a natural benchmark. Critically, modest charges can maintain access to safe liquidity for businesses at a modest price and protect taxpayers from avoidable unnecessary runs.

Revenues from occasional redemption charges may be assigned to aid the process of recovery. Assigning them to the bankruptcy estate will contribute to a general if modest relief. If the bank suffering outflows ultimately recovers, they will contribute to the recapitalization process. If the bank ultimately fails, charges will be a bail-in contribution to the resolution process. An alternative would be to preassign these revenues to back undrawn uninsured deposits, in default or possibly even in a direct transfer after the charges are suspended. A direct rollover benefit will further reduce run incentives and back the recovery process. Paradoxically, the rollover premium will increase in the scale of outflows, further containing the strategic escalation driving a self-fulfilling run.

Charges are likely to affect run incentives in terms of their timing. Some depositors are alert and may withdraw earlier when the chance of charges arises, even when they do not need immediate liquidity. Indeed, the anticipation of gates will accelerate outflows, with the effect that charges will be activated promptly. The trade-off is between faster but contained runs, versus the usual buildup of outflows progressively escalating then bursting into an uncontrollable final run.

An alternative interim measure proposal is to mandatorily require banks to pre-position collateral against their runnable liabilities in times of stress (Barr 2024; G-30 2024). However, this proposal seems to run into all the problems and limitations currently preventing recovery. Based on the analyses of Sections II and III, it is reasonable to think that pre-positioning requirements will be triggered too late or be too lax, with considerable difficulty in enforcement to prevent adverse signals and stigma. Moreover, the valuation of collateral in times of stress is delicate and, in systemic events, can result in sizeable risk for the central banks, with indirect fiscal effects. This would represent yet a new form of bailout. Finally, the requirement to pre-position collateral against all runnable liabilities may restrict too much banks' abilities to engage in socially beneficial intermediation. However, moderate pre-positioning requirements represent an excellent complement to our proposals, especially in relation to the ELA necessary to finance recovery.

VI. Conclusions

The sequence of distressed bank runs in March 2023 has made painfully clear that supervisors have no effective tools and poor incentives to take early actions out of fear of triggering runs. We have advanced the notion of a strengthened regime of contingent intervention aimed at avoiding unnecessary default (*in loco bancaruptae*) and giving a chance of recovery for banks deemed to be in principle viable. The contingent measures involve targeting run incentives by preemptive partial bail-in of investors or uninsured depositors, acting as automatic stabilizers triggered by large outflows. Credible preventive measures pressure bank shareholders for a timely response, limit forbearance, and improve the chances of a bank's recovery over its resolution. Contingent measures complement ex ante capital and liquidity buffers and will not rely as much on book equity measures. They are vastly preferable to an expansion of deposit insurance for uninsured corporate deposits that would lead to higher moral hazard and risk creation. Deposits serve a primary safety role for households, so household deposit insurance is a legitimate public goal. On the other hand, businesses can bear a modest amount of price risk on their cash pools and have historically held cash in MMFs for a better yield at a modest price risk. As a final piece of evidence, almost \$300 billion in corporate deposits shifted in March–April 2023 from banks into MMFs, which are subject to redemption fees (Masters, Clarfelt, and Duguid 2023).

VII. References

Acharya, Viral V., Nirupama Kulkarni, and Matthew Richardson. 2011. "Capital, Contingent Capital, and Liquidity Requirements." In *Regulating Wall Street: The Dodd-Frank Act and the New Architecture of Global Finance*, edited by Viral V. Acharya, Thomas F. Cooley Matthew Richardson, and Ingo Walter, 143–180. Hoboken, NJ: John Wiley & Sons

Admati, Anat, and Martin Hellwig. 2024. *The Bankers' New Clothes: What's Wrong with Banking and What to Do about It - New and Expanded Edition*. Princeton, NJ: Princeton University Press.

Ahnert, Toni, and Co-Pierre Georg. 2018. "Information Contagion and Systemic Risk." *Journal of Financial Stability* 35 (April): 159–71.
<https://doi.org/10.1016/j.jfs.2017.05.009>

Armantier, Olivier, Eric Ghysels, Asani Sarkar, and Jeffrey Shrader. 2015. "Discount Window Stigma during the 2007–2008 Financial Crisis." *Journal of Financial Economics* 118, no. 2: 317–35.
<https://doi.org/10.1016/j.jfineco.2015.08.006>

Barr, Michael S. 2024. "On Building a Resilient Regulatory Framework" Speech delivered at the Central Banking in the Post-Pandemic Financial System 28th Annual Financial Markets Conference, Federal Reserve Bank of Atlanta, Fernandina Beach, FL, May 20, 2024.
<https://fedinprint.org/item/fedgsq/98259>

Ben-Shahar, Omri, and Anu Bradford. 2013. "Reversible Rewards." *American Law and Economics Review* 15, no. 1: 156–86.
<https://doi.org/10.1093/aler/ahs018>

Cecchetti, Stephen G., and Kermit L. Schoenholtz. 2023. "Making Banking Safe." CEPR Discussion Paper No. 18302.
<https://cepr.org/publications/dp18302>

Chan, Stephanie, and Sweder van Wijnbergen. 2014. "CoCos, Contagion and Systemic Risk." CEPR Discussion Papers, 10960. Tinbergen Institute Discussion Paper No. 14-110/VI/DSF 79, October 29, 2014.
<https://ideas.repec.org/p/tin/wpaper/20140110.html>

Cookson, J. Anthony, Corbin Fox, Javier Gil-Bazo, Juan Felipe Imbet, and Christoph Schiller. 2023. "Social Media as a Bank Run Catalyst." Université Paris-Dauphine Research Paper No. 4422754, June 24, 2023.
https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4422754

Credit Suisse. 2017. Proposed Offering of CHF 200 million 3.875% Perpetual Tier 1 Contingent Write-down Capital Notes. March 20, 2017.
[http://www.kccllc.net/document/887190023032400000000001](http://www.kccllc.net/document/88719002303240000000000001)

Dang, Tri Vi, Gary Gorton, and Bengt Holmström. 2020. "The Information View of Financial Crises." *Annual Review of Financial Economics* 12 (November): 39–65.
<https://www.annualreviews.org/content/journals/10.1146/annurev-financial-110118-123041>

Davies, Daniel. 2024. "Endgame for Endgame? Trump vs Basel III." *Financial Times*, November 14, 2024.
<https://www.ft.com/content/899f499e-2249-40f8-9d0c-fa72ffb98869>

Dewatripont, Mathias, Peter Praet, and André Sapir. 2023. "The Silicon Valley Bank Collapse: Prudential Regulation Lessons for Europe and the World." VoxEU Column, March 20, 2023.
<https://cepr.org/voxeu/columns/silicon-valley-bank-collapse-prudential-regulation-lessons-europe-and-world>

Diamond, Douglas W, and Philip H. Dybvig. 1983. "Bank Runs, Deposit Insurance, and Liquidity." *Journal of Political Economy* 91, no. 3): 401–19.
<https://doi.org/10.1086/261155>

Ennis, Huberto M. 2019. "Interventions in Markets with Adverse Selection: Implications for Discount Window Stigma." *Journal of Money, Credit and Banking* 51, no. 7: 1737–64.
<https://doi.org/10.1111/jmcb.12583>

Federal Deposit Insurance Corporation (FDIC). 2023. "Options for Deposit Insurance Reform." May 1, 2023.
<https://www.fdic.gov/analysis/options-deposit-insurance-reform>

FINMA. 2023. "Lessons Learned from the CS Crisis." December 19, 2023.
https://www.finma.ch/en/~media/finma/dokumente/dokumentencenter/myfinma/finma-publikationen/cs-bericht/20231219-finma-bericht-cs.pdf?sc_lang=en&hash=3F13A6D9398F2F55B90347A64E269F44

Gambacorta, Leonardo, Tommaso Oliviero, and Hyun Song Shin. 2023. "Low Price-to-Book Ratios and Bank Dividend Payouts: Economic Policy Implications." *Economic Policy* 38, no. 115: 675–701.
<https://doi.org/10.1093/epolic/eiad028>

Gertner, Robert, and David Scharfstein. 1991. "A Theory of Workouts and the Effects of Reorganization Law." *Journal of Finance* 46, no. 4: 1189–1222.
<https://doi.org/10.1111/j.1540-6261.1991.tb04615.x>

Glasserman, Paul, and Enrico Perotti. 2017. "The Unconvertible CoCo Bonds." In *Achieving Financial Stability: Challenges to Prudential Regulation*, edited by Douglas D. Evanoff, George G. Kaufman, Agnese Leonello, and Simone Manganelli, 317–29. Singapore: World Scientific Publishing Co.

Gorton, Gary, and Guillermo Ordoñez. 2020. "Fighting Crises with Secrecy." *American*

Economic Journal: Macroeconomics 12, no. 4: 218–45.

<https://doi.org/10.1257/mac.20190169>

Gorton, Gary B., Chase P. Ross, and Sharon Y. Ross. 2024. “Where Collateral Sleeps.” S&P Global Market Intelligence, October 29, 2024.

https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4923083

Group of Thirty (G-30). 2024. “Bank Failures and Contagion: Lender of Last Resort, Liquidity, and Risk Management.” Report of the G-30 Working Group on the 2023 Banking Crisis, January 2024.

https://gceps.princeton.edu/wp-content/uploads/2024/05/wp329_Dudley_G30_Lessons-23-Crisis_RPT.pdf

Hart, Oliver, and Luigi Zingales. 2011. “A New Capital Regulation for Large Financial Institutions.” *American Law and Economics Review* 13, no. 2: 453–90.

<https://doi.org/10.1093/aler/ahr001>

Heider, Florian, Jan Pieter Krahn, Lorian Pelizzon, Jonas Schlegel, and Tobias Tröger. 2023. “European Lessons from Silicon Valley Bank Resolution: A Plea for a Comprehensive Demand Deposit Protection Scheme (CDDPS).” Leibniz Institute for Financial Research, SAFE Policy Letter No. 98, March 2023.

<https://ideas.repec.org/p/zbw/safepl/98.html>

Jiang, Erica Xuwei, Gregor Matvos, Tomasz Piskorski, and Amit Seru. 2024. “Monetary Tightening and US Bank Fragility in 2023: Mark-to-Market Losses and Uninsured Depositor Runs?” *Journal of Financial Economics* 159 (September): 103899.

<https://doi.org/10.1016/j.jfineco.2024.103899>

Kashyap, Anil K., Raghuram G. Rajan, and Jeremy C. Stein. 2008. “Rethinking Capital Regulation.” In “*Maintaining Stability in a Changing Financial System*,” Proceedings of the Jackson Hole Economic Policy Symposium, Federal Reserve Bank of Kansas City, Jackson Hole, WY, August 21–23, 2008: 431–71.

<https://www.kansascityfed.org/Jackson%20Hole/documents/3175/2008-KashyapRajanStein031209.pdf>

Martino, Edoardo D. 2019. “Bail-inable Securities and Financial Contracting: Can Contracts Discipline Bankers?” *European Journal of Risk Regulation* 10, no. 1: 164–79.

<https://doi.org/10.1017/err.2019.5>

———. 2020. “The Bail-in beyond Unpredictability: Creditors’ Incentives and Market Discipline.” *European Business Organization Law Review* 21, no. 4: 789–828.

<https://doi.org/10.1007/s40804-020-00188-7>

———. 2021. “Towards an Optimal Composition of Bail-inable Debtholders?” *Journal of Corporate Law Studies* 21, no. 2: 321–64.

<https://doi.org/10.1080/14735970.2021.1908808>

- Martino, Edoardo D., Casimiro A. Nigro, and Tom Vos. 2024. "CoCos in Europe: What Is Wrong – and How to Fix It?" EBI Working Paper Series No. 169, May 13, 2024. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4810761
- Martino, Edoardo D., and Katarzyna M. Parchimowicz. 2021. "Go Preventive or Go Home—the Double Nature of MREL." *European Company and Financial Law Review* 18, no. 4: 608–39. <https://doi.org/10.1515/ecfr-2021-0023>
- Martynova, Natalya, and Enrico Perotti. 2018. "Convertible Bonds and Bank Risk-Taking." In "Banking and Regulation: The Next Frontier," edited by Mathias Dewatripont and Diana Hancock, special issue, *Journal of Financial Intermediation* 35 (July): 61–80. <https://doi.org/10.1016/j.jfi.2018.01.002>
- Martynova, Natalya, Enrico Perotti, and Javier Suarez. 2022. "Capital Forbearance in the Bank Recovery and Resolution Game." *Journal of Financial Economics* 146, no. 3: 884–904. <https://doi.org/10.1016/j.jfineco.2022.09.006>
- Masters, Brooke, Harriet Clarfelt, and Kate Duguid. 2023. "Money Market Funds Swell by More than \$286bn amid Deposit Flight." *Financial Times*, March 26, 2023. <https://www.ft.com/content/032523bc-3b92-4b94-b6b8-ebbe1d606b2c>
- Matta, Rafael, and Enrico Perotti. 2024. "Pay, Stay, or Delay? How to Settle a Run." *Review of Financial Studies* 37, no. 4: 1368–1407. <https://doi.org/10.1093/rfs/hhad084>
- Matta, Rafael, Remo Oostdam, and Enrico Perotti. Forthcoming. "Contingent Fees to Contain Bank Runs." University of Amsterdam working paper. <https://elischolar.library.yale.edu/ypfs-documents2/5464/>
- McLaughlin, Susan. 2024. "Lessons for the Discount Window from the March 2023 Bank Failures." *Journal of Financial Crises* 6, no. 2: 72–84. <https://elischolar.library.yale.edu/journal-of-financial-crises/vol6/iss2/3/>
- Ohlrogge, Michael. Forthcoming. "Why Have Uninsured Depositors Become de Facto Insured?" *New York University Law Review* 100 (forthcoming).
- Perotti, Enrico. 2023a. "The Swiss Authorities Enforced a Legitimate Going Concern Conversion." VoxEU Column, March 22, 2023. <https://cepr.org/voxeu/columns/swiss-authorities-enforced-legitimate-going-concern-conversion>
- . 2023b. "Measures to Prevent Runs on Solvent Banks." VoxEU Column, July 1, 2023. <https://cepr.org/voxeu/columns/measures-prevent-runs-solvent-banks>

Perotti, Enrico, and Javier Suarez. 2011. "A Pigovian Approach to Liquidity Regulation." In "Special Issue: The Real and Financial Effects of Basel III," *International Journal of Central Banking* 7, no. 4: 3–41.

<https://www.ijcb.org/journal/ijcb11q4a1.htm>

VIII. Appendixes

Appendix A: The EU Recovery and Resolution Framework

The European Union (EU) Recovery and Resolution Directive is arguably misnamed. It is largely focused on containing bailouts through bail-in upon default, rather than offering options for timely recovery. The lack of effective recovery tools also endangers the credible implementation of gone-concern resolution tools when necessary, increasing the regulatory gap (Martino 2020; Martino 2021). National resistance has undermined the formal resolution process, bypassing it by declaring standard bankruptcy (Dewatripont, Praet, and Sapir 2023). In the United States, the Federal Deposit Insurance Corporation is the sole authority and benefits from more instruments. However, in practice, it has been ultimately forced into a bailout. The amount of uninsured demandable deposits bailed in since 2007 in the US is exactly zero.

In principle, Basel III encouraged bank issuance of contingent convertible (CoCo) debt as a form of pre-issued equity capital to be used ahead of distress (Kashyap, Rajan, and Stein 2008). Conversion of debt into equity ensures a sharp drop in leverage upon early signs of distress, reducing risk incentives and giving a chance of recovery ahead of resolution (Martynova and Perotti 2018). It was thus intended as a form of going-concern bail-in, alleviating solvency concerns at a critical time.¹⁵ This potential has not been realized in EU legislation. It admits CoCo debt to count as additional Tier 1 (AT1) capital, although its equity conversion would occur once book equity falls to a risibly low level (just above 5%, when the bank is quite insolvent). In addition, the choice of a book trigger for conversion requires the bank to publicly recognize huge losses that certify near insolvency, a guarantee for massive runs. EU supervisors have shown no intent to ever call for a conversion that would highlight such losses. In their view, any public hint of undercapitalization may trigger an unstoppable run (Chan and van Wijnbergen 2014). This is a justifiable concern if conversion takes place too late (that is, at a book equity trigger way too low) and there are no safeguards in place to contain runs.

As a result, no CoCo bonds have ever converted in the EU ahead of default. In actual default, they were suffered losses like any other bond. In fact, not a single coupon has ever been suspended, as regulators feared triggering panic. They should be then treated as gone-concern instruments and removed from AT1 status. Overall, EU CoCo bond prices have reflected zero conversion risk since 2016, when the EU authorities failed to suspend a single coupon on a Deutsche Bank CoCo bond (Glasserman and Perotti 2017). Clearly, the market no longer believed in any going-concern loss absorption. Finally, virtually all CoCo instruments so far have been called at the first possible redemption window (usually five years), making the instruments perpetual only in name. In conclusion, there are no effective tools in EU legislation enabling a solvent but undercapitalized bank a chance to recover, outside of public bank recapitalization. As a result, forbearance has been the general outcome.

¹⁵ CoCo bonds have not been issued in the US as they do not qualify as debt for fiscal purposes.

Appendix B: Lessons from the Credit Suisse AT1 Going-concern Bail-in

In contrast to the European Union bank capital legislation, Switzerland adopted a much more vigorous approach on additional Tier 1 (AT1) going-concern bail-in, with the express goal of avoiding costly bailouts such as the UBS rescue in 2009. The legislation imposed larger capital buffer and higher contingent convertible (CoCo) debt conversion triggers at or above 7% of book equity (thus ensuring a full capital conservation buffer upon conversion). Critically, Swiss banks issuing CoCos were required to include a “discretionary trigger” in the bond indenture (Martino 2019; Martino, Nigro, and Vos 2024). This enhanced Pillar II power enabled a successful going-concern bail-in operation for Credit Suisse, which averted a fiscal costly default and a messy resolution process (Perotti 2023a).

Specifically, the Swiss Financial Market Supervisory Authority (FINMA) was empowered to force the conversion without a formal accounting restatement of book equity, upon a “viability event” that would have led to default even when the bank was deemed in principle solvent (as Credit Suisse was assessed to be a few days before conversion). The standard clause in Credit Suisse CoCo indentures states that conversion will be activate if:

(A) the Regulator has notified CSG that it has determined that a write-down of the Notes, together with the conversion or write down/off of holders’ claims in respect of any and all other Progressive Component Capital Instruments, Buffer Capital Instruments, Tier 1 Instruments and Tier 2 Instruments that, pursuant to their terms or by operation of law, are capable of being converted into equity or written down/off at that time is, because customary measures to improve CSG’s [Credit Suisse Group] capital adequacy are at the time inadequate or unfeasible, an essential requirement to prevent CSG from becoming insolvent, bankrupt or unable to pay a material part of its debts as they fall due, or from ceasing to carry on its business; or (B) customary measures to improve CSG’s capital adequacy being at the time inadequate or unfeasible, CSG has received an irrevocable commitment of extraordinary support from the Public Sector (beyond customary transactions and arrangements in the ordinary course) that has the effect of improving CSG’s capital adequacy and without which, in the determination of the Regulator, CSG would have become insolvent, bankrupt, unable to pay a material part of its debts as they fall due or unable to carry on its business. (Credit Suisse 2017, 10-11)

In other words, the regulatory trigger was authorized as soon as failure to convert would imply some fiscal risks for the Swiss treasury. This is indeed the principle for a rigorous preventive bail-in procedure, focused on recovery.

The Credit Suisse experience has a valuable lesson on the necessity of legal clarity. Credit Suisse had experienced for quite some time a steady deterioration in value and investor confidence. Yet the Swiss regulator FINMA chose to delay activating a conversion, even though its need was already evident—as FINMA’s recent report attests to (FINMA, 2023). Supervisors hesitated for at least two years, arguing on the conditions under which they had a clear legal right to activate the regulatory trigger.

It took an explicit act of legislation by the Swiss Parliament to firmly establish FINMA’s right of activation. At the time, Credit Suisse had already been forced to request emergency

liquidity assistance (ELA) from the Swiss National Bank, backed by the fiscal capacity of the Swiss federal state.

The Swiss Parliament passed in an emergency meeting a law clarifying that such an ELA operation indeed represented a case of fiscal exposure, thus enabling the regulator to act. This led for the first time to a going-concern recapitalization of AT1 bonds, and to bank recovery rather than resolution.¹⁶

It is important to stress that the final outcome was indeed the intent of the law. The specific contractual formulation of the Credit Suisse AT1 CoCo debentures implied that creditors end up being fully wiped out while shareholders retained a stake in the enterprise. Such was not the explicit intent of the law, rather a private choice to designate the outcome of going-concern bail-in as a complete debt cancellation, a simpler legal construction than the creation of a new equity interest. Because of the confusion created by the wipeout, in the future, all CoCo conversions could consist of (at least partially) a transformation into equity capital.

It is important to learn from the experience of this sole example of a successful (if chaotic) going-concern bail-in.

¹⁶ CoCo bondholders who were wiped out are currently suing FINMA, disputing whether the bank “has received an irrevocable commitment of extraordinary support from the Public Sector” as required by the bond indenture (Credit Suisse 2017, 10-11).

Appendix C: When Is a Bank Undercapitalized?

Preventive bail-in measures must be targeted at banks deemed solvent but undercapitalized. If a bank is insolvent, resolution (ideally with adequate risk-absorbing capacity) is the sole legitimate policy. So, a credible and fair recovery regime requires a definition of a legitimate candidate bank that would benefit from going-concern bail-in measures, not least to stand legal scrutiny.

The Basel regulatory framework almost exclusively focuses on adjusted book equity measures. The use of market values has been resisted on the ground of potential manipulation of trigger indicators.¹⁷ Yet accounting figures are at best past and infrequent measures of net value, so interim supervisory assessments of bank solvency are necessary. Stress tests are the standard method to assess resilience under adverse scenarios and define the degree of capitalization. Yet book equity is a measure of current assets, while the value of a bank includes future prospects driven by its deposit franchise. Stress tests implicitly factor in such values, which may be positive or negative.

From an economic perspective, a bank with inadequate equity may be considered solvent if it has a viable business model, especially if its losses are on safe asset holdings so that the downside risk of credit losses is limited. Such a bank may be at the mercy of run expectations, as both the value of its assets and the value of its deposit franchise cannot be realized in a quick sale. This is the category of banks that would benefit from going-concern conversion. A contingent bail-in favors recovery as long as it is coupled with tools to prevent panics and generate runs, such as the liquidity charge we propose.

In contrast, a bank with the same level of book equity value but with sizeable losses, low deposit franchise value, and very poor future prospects is a prime candidate for resolution. In this case, a going-concern bail-in would not create the conditions for recovery and should be seen as unfair treatment of some investors. A consistent and legally binding definition is needed to justify the additional supervisory powers.

Beyond capital requirements, the post-2008 regulation also introduced the total loss-absorbing capacity (TLAC) requirements to ensure resolution without bailout. TLAC is the minimum stock of bail-inable capital, currently set to 18% of risk-weighted assets for systemic banks.¹⁸ It comprises common equity, additional Tier 1 capital instruments, and long-term, subordinated, unsecured debt that will be wiped out upon insolvency. These requirements are crucial for an orderly resolution of banks that does not rely on a fiscal backstop. High risk-absorbing capacity has also an effect on risk appetite as they decreased risk shifting incentives. However, the designated function for TLAC and minimum requirement for own funds and eligible liabilities (MREL) capital is to ensure bail-in in a gone-concern resolution, so they have no direct counterpart in a recovery process.

¹⁷ This view is also consistent with the idea that banks' stability requires some level of opacity (Dang, Gorton, and Holmström 2020).

¹⁸ TLAC rules were transposed in the EU as the minimum requirement for own funds and eligible liabilities.

The recovery measures we propose should be seen as a recovery-aimed complement to the resolution and loss-absorbency requirements. They parallel the mandate to the resolution authority to convert or write down TLAC liabilities once the banks become insolvent, or to impose moratoria on withdrawals to avoid runs very close to insolvency.

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