

***REGIMES FOR LENDER OF LAST
RESORT ASSISTANCE TO ILLIQUID
MONETARY INSTITUTIONS: LESSONS IN
THE WAKE OF CREDIT SUISSE***

**REPORT TO THE SWISS FINANCE MINISTRY
BY PAUL TUCKER, AUTUMN 2023**

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PAPER ON LOLR SUBMITTED TO SWISS FINANCE MINISTRY

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REGIMES FOR LENDER OF LAST RESORT ASSISTANCE TO ILLIQUID MONETARY INSTITUTIONS: LESSONS IN THE WAKE OF CREDIT SUISSE

This report has been commissioned as part of the efforts of the Swiss government to learn lessons for its banking regime from the failure and rescue of the Credit Suisse group in March 2023. The mandate was not to investigate, with complete access to private information, the precise circumstances and timeline of the bank's failure and rescue. Rather, it addresses the design and application of lender of last resort (LOLR) policies and operations in general and for Switzerland, and aims to do so in ways that might be useful to those who know why they acted and communicated as they did.

From the outside, the salient features of Credit Suisse's demise are as follows. The group appears, on published numbers, to have been comfortably solvent. Instead, the group seems to have fallen apart for essentially reputational reasons, causing customers to cease using it, which involved their transferring deposits away in ways that spiralled into a full-blown liquidity crisis.² The idiosyncrasy of the firm's malaise fits with the lack of contagion to other parts of the financial system. For some reason(s), the authorities did not arrest the

¹ Paul Tucker is a research fellow at the Mossavar-Rahmani Center for Business and Government at the Harvard Kennedy School, and the author of two books including *Unelected Power: The Quest for Legitimacy in Central Banking and the Regulatory State* (Princeton University Press, 2018). He was a central banker for over thirty years up to late-2013. During that time, he worked on, among other things, line prudential supervision, prudential policy, money market operations and facilities, government debt management, payment and settlement systems, financial stability policy including resolution policy, and monetary policy. He served on all the Bank of England's key policy committees, and was responsible for its balance sheet for a number of years. He chaired two international committees in Basel, as well as some ad hoc working groups. He was a director of the Bank for International Settlements. Today he is a main board member of Swiss Re.

² One media commentator put it thus: "Credit Suisse...managed to scandalise itself out of existence, to die from embarrassment. It had lurched from one crisis to another, be it Greensill Capital, Archegos, "tuna bonds" or being forced to delay its results following a call from the US Securities and Exchange Commission.... Its investors and customers just lost faith in the bank --- operationally, culturally and managerially." Helen Thomas, "How 'competitive' would you like your bank regulation now?" *Financial Times*, March 20, 2023.

decline in time, or provide funding to bridge to other conceivable solutions. Instead, the group was sold to UBS, assisted by backing from the state³ and the write-off of certain kinds of bond. It can seem —- again, I stress, from the outside —- as though the Swiss regime for banking stability was deeply flawed, inadequately implemented, or constrained by operational choices made years before.⁴

Other speculations have focussed, more narrowly, on an apparent lack of eligible collateral against which the Swiss National Bank (SNB) could have tried to facilitate other possible solutions. There is hint of this in what the Swiss have termed "ELA+" which involved the central bank lending to CS not, in the usual way, against specific assets but unsecured with, thanks to an emergency government ordinance, preferred rights in a bankruptcy. That is quite something. But the improvisation points to more concrete questions. Did CS simply not have much good collateral (putting the assertions about solvency into doubt)? Or was it a matter of the central bank being unable or, differently, unwilling to lend against some types of good collateral? And why was any collateral-shortage problem not identified and addressed years before? While, again, it is not my mandate to dig into exactly what happened, it is possible to identify weaknesses in the design and operation of the Swiss banking regime that bear on those questions.

Without getting into the innards of CS affair, then, what is discussed is relevant to whether different policies for lending of last resort could have helped in several ways. First, a different LOLR crisis-management regime might have enabled an alternative solution. These include the SNB being better able either to help fund an orderly run down (with public sale of parts of the business and perhaps a private auction of others), or to support a special resolution with liquidity if, despite appearances, the group was in fact fundamentally insolvent. Given the nature of this exercise, it is impossible to reach a definitive

³ That UBS surrendered a government indemnity from certain losses fairly soon after the merger was effected might suggest it did not find a hole in the CS balance sheet, and hence that CS was, broadly speaking, as comfortably solvent as claimed by its former managers and its supervisors.

⁴ In my view, those possibilities, which are not mutually exclusive, remain open in the light of the expert group report, but to be clear the report does not conclude that any of them is true. See *The Need for Reform after the Demise of Credit Suisse*, Report of the Expert Group on Banking Stability, 1 September 2023. Link here: https://too-big-to-fail.ch/en_US/report/

view on that. Notably, I cannot judge whether the unravelling of the business model precluded other courses once collapse engulfed the authorities. But a better LOLR regime would, second, have changed the incentives for planning, preparation, and pre-emption --- at the SNB as well as at the Financial Market Supervisory Authority (FINMA). Even if none of the circulating speculations about the handling of the crisis hits the mark, those broader LOLR-regime lessons are relevant for the years before policymakers found themselves concluding, in the heat of events, that their best option was to have the whole CS group transferred to UBS.

Definition of the Lender of Last Resort

Most modern writing on the lender of last resort takes as its starting point the dictum of Walter Bagehot, the editor of the *Economist* magazine, writing in the aftermath of the great London banking crisis of 1866. My own paraphrase of Bagehot is:⁵

Central banks should make clear that they stand ready to lend early and freely (i.e., without limit), to sound firms, against good collateral, and at rates higher than those prevailing in normal market conditions.

I begin there because it is important to remember the circumstances in which Bagehot was writing, and how they differ from ours. The Bank of England, although in practice largely an organ of the state, was privately owned. Britain's electoral system was still based on a limited franchise. The country was on the gold standard, so that a run on the banks could be a run into gold, linking external and internal monetary strains. There was no statutory system of prudential regulation and supervision. There was no deposit insurance, and no special resolution regime for banks; only a bankruptcy regime for firms and

⁵ See Tucker, "The Lender of Last Resort and Modern Central Banking: Principles and Reconstruction." BIS Papers, No. 79, Bank for International Settlements, 2014, p. 15. This definition-cum-paraphrase has been widely used, including in a textbook co-authored by leading US legal scholars. Howell Jackson, Margaret Tahyar, and Michael Barr, *Financial Regulation: Law and Policy*, West Academic, 2018, chapter 9.1.

natural persons. None of those things is true today of (almost) any of the advanced-economy constitutional democracies, and so some of Bagehot's arguments might not run in quite the same way, or even at all. Instead, we need to see the modern LOLR as operating in a world with fiat money, with monetary policy delegated by full-franchise democratic institutions to arm's length (independent) central banks, and in the context of rich regimes for banking regulation, supervision, and resolution.

Structure of the report

The report accordingly begins, in Part 1, by summarising the general features of prudential regimes for banking, and how lender of last resort policies and operations fit into them. It then turns, in Part 2, to the core question of how to think about and structure LOLR regimes. Part 3 gives my normative view on the design and governance of LOLR regimes in general, which I think should be the benchmark for Swiss reforms. Part 4 addresses issues that, it seems to me, need elaboration or refinement for the Swiss context, including in the wake of the Credit Suisse crisis. Along the way, examples are drawn from the history and current practice of the euro area, the US and the UK. Annex A summarises each of their LOLR regimes more systematically,⁶ and Annex B elaborates on my preferred version of a policy for pre-positioned collateral. Some readers might want to skip Parts 1 and 2, jumping straight to the prescriptions. That would risk losing some of the reasoning; much of the literature on LOLR is either abstract or in the weeds whereas many of my recommendations are driven by the territory in between. Emerging themes will include the vital importance of policy design, detailed contingency planning, and rigorous operational preparation.

The report does not address liquidity assistance in foreign currencies, or cross-border cooperation among central banks. Nor does it do more than mention the important issue of whether any non-banks (including within banking

⁶ I am grateful to Swiss officials --- especially from the finance ministry and the central bank --- for answering my questions of fact about the law and regime promptly and patiently. My thanks also to current and former officials of other jurisdictions for answering questions of fact about what is in the public realm about their regimes.

groups) should have access to liquidity insurance from the central bank, and it does not cover how LOLR policy fits with any operations a central bank conducts as a market maker of last resort (involving outright purchases in asset markets).⁷

PART 1: LOLR IN THE CONTEXT OF THE BROADER STANDARD REGIME FOR FINANCIAL STABILITY

Banking institutions play an important role in the economy but are inherently fragile, exposed to crises of confidence and runs. They are important because, at their simplest, they fund portfolios of illiquid loans to households and businesses through a mixture of common equity (which absorbs losses smoothly), bonds of various kinds, and demand deposits. Those deposits can, on demand, be transferred to other banks or exchanged for notes issued by the central bank. In other words, banks' demand deposits function as money, giving them the capacity to offer on-demand committed lines of credit. Commercial banks are, therefore, at the heart of an economy's payment system and also its credit system. On both sides of their balance sheets, they provide customers with insurance against liquidity risks, enabling households and firms to economise on liquid assets, releasing resources for consumption and risky investments.⁸ This, baldly, is the social purpose they serve.

What makes commercial banks useful renders them fragile. This fragility arises because depositors and other short-term creditors have an incentive to run whenever they believe (or believe that others believe) that they will not be

⁷ This report was first submitted on Sunday 24 September 2023. When it was not immediately published, with agreement of the Swiss finance ministry I have had a chance to iron out infelicities in spelling, syntax and phrasing, and to recheck facts. None of those corrections materially affected any of my analysis, findings and recommendations. This version was submitted on Sunday 17 December.

⁸ When the incidence of drawings on on-demand deposits and on-demand lines of credit are not highly correlated, it can be efficient for the two variants of liquidity-insurance services to be bundled together in one type of firm (commercial banks). See Kashyap, Anil, Raghuram Rajan and Jeremy Stein. "Banks as Liquidity Providers: An Explanation for the Coexistence of Lending and Deposit-taking." *Journal of Finance* 57, no. 1 (2002): 33–73.

repaid in full if they hang around. Runs can be warranted when a bank's fundamental health (balance-sheet solvency) is severely impaired or put into very serious question; for example, by news about losses or revelations about gross incompetence or dishonesty. But runs can also be rational, in a self-fulfilling way, when a bank that is *ex ante* healthy would be rendered unhealthy *ex post* by remedial actions it takes to forestall a crisis of confidence. Because banks can be socially useful, such crises can be socially costly. The Lender of Last Resort (LOLR) is called into existence to head off or contain those social costs. Only central banks can act as the LOLR very quickly. Even Treasury departments need to raise resources in the market (by issuing Treasury Bills) whereas central banks can simply create more of their own money. As such, central banks are in the business of providing liquidity reinsurance to banks that offer liquidity-insurance services to the rest of the economy. Like any form of insurance, where banks know the reinsurance is available, they have incentives to take more risk unless the terms of LOLR assistance dictate otherwise. The central banking profession is still exploring how to do this effectively and efficiently.

The purpose of this first part of the report is, accordingly, to flesh out that high-level summary, placing the lender of last resort within the broader context of regimes for banking system stability. It is necessary to be clear about the purpose of such regimes, and about how LOLR policies, facilities and operations are entangled with prudential regulation, prudential supervision, and the recovery and resolution of ailing and broken banking groups. It is not possible to design and operate a sensible LOLR policy without taking into account those inter-related endeavours.

Liquidity runs and the public policy purpose of prudential regimes for banking

As a general matter, the standard justification for state intervention in the market economy turns on a wedge existing between the welfare of contracting parties (private welfare) and the welfare of third parties or the public as a

whole (social welfare); i.e. that social costs (or benefits) are greater than private costs (benefits). In the case of banking, such a wedge can exist between the private costs and social costs of distress or outright failure. It is typically thought to arise because a distressed firm often undertakes a fire sale of assets (or cuts back lending) in order to raise funds to meet maturing liabilities (its private need). With on-demand liabilities, a run for the exits generates a need for more liquidity than most banks have to hand, so they have to dispose of assets to meet redemptions, and so avoid default. The same goes if a bank has many short-term liabilities that are not rolled over.

Since liabilities are repaid on a first come-first served basis, creditors have incentives to demand repayment if they think others are doing so (or about to do so), even if they believe (and it is true that) the bank concerned would otherwise be solvent. That is because the asset sales will be made at a discount to their true or fundamental value. So, even if a bank is fundamentally sound, a run can be self-fulfilling; *ex post* the bank will be insolvent, so best to get out.⁹

Such runs can build slowly or start abruptly. In the light of runs on Silicon Valley Bank (SVB) and other US regional bank during spring 2023, commentators are observing that these days, given social media, abrupt and extraordinarily rapid runs are a new feature of banking. The point is not without merit but risks obscuring a much older truth. As Bank of England governor Andrew Bailey observed, with nice understatement, on the SVB affair, it was the fastest run he had seen since Barings' in the early-1990s.¹⁰ So, the possibility of super rapid runs has been on policy makers' radar for ages, and all the more so after the 2007-09 Global Financial Crisis (GFC).

In any case, whatever the speed, a small bank having to sell assets to raise funds (or cut back lending to conserve funds) will not necessarily have a large or lasting effect on asset values or the economy more widely. But things are different if the seller is a large bank or if a number of small banks are having to sell assets to raise liquidity. Even where a problem is initially manifest in a

⁹ Diamond, Douglas W. and P. H. Dybvig. "Bank runs, deposit insurance, and liquidity." *Journal of Political Economy* 91, no. 3 (1983): 401–19.

¹⁰ Andrew Bailey, oral evidence to UK Treasury Committee, Tuesday 28 March 2023, answer to Q2.

single bank, it can spread to others if they have or are perceived to have (a) a business model or financial structure that is similar to that of the distressed firm, and/or (b) actual or contingent financial or operational exposures to the distressed firm.

In aggregate, banks selling assets and rationing the provision of credit (and other services) in order to harvest liquidity can seriously harm the economy as a whole. Through adverse effects on wealth, the cost of capital, the availability of working capital, and uncertainty, both consumption and business investment are impaired, pushing the economy towards or into recession (public costs). None of a bank's equity holders, bondholders or other creditors has incentives to price for those adverse feedback effects (externalities) when investing in or lending to a bank. Nor, given standard remuneration contracts, do management or the bank's board of directors.

The presence of externalities alone would probably not warrant the vast effort taken to regulate banks in the interests of safety and soundness. As a general matter, externalities can also sometimes be mitigated via legal rights to compensation enforced via the courts. But that is not a realistic option if a banking crisis leaves a political society poorer in aggregate. The case for statutory regulatory regimes for banking is driven by the magnitude of the social costs that can be entailed by banking crises, and the importance of preventing and containing them rather than compensating citizens after the destruction.

Responding to the inherent fragility of fractional-reserve banking

Lender of Last Resort activities find their place in a rich combination of policy regimes that have evolved over the past two hundred years or so, and especially since the last elements of a commodity monetary standard ended in the early-1970s with the unravelling of the Bretton Woods system. The various elements are driven by judgments about the sources of banking fragility. Big picture, the fragility is greater, (a) the smaller a bank's tangible common equity

in relation to its balance-sheet and other exposures (because a run will occur as insolvency approaches), (b) the more concentrated its loan portfolio (so that its risks are correlated rather than diversified), (c) the greater its reliance on short-term funding (because more can run), (d) the more its management is dominated by one or a few individuals (because of impaired checks and balances on policy, execution and disclosures). Albeit at different times in different jurisdictions, this led to the development of a combination of regulation, supervision, and safety nets.

Regulatory regimes typically set minimum requirements for equity, portfolio diversification and liquid assets, together with broader standards requiring “prudent management” and that core members of the team directing and managing a bank be “fit and proper”. The supervisory regimes, meanwhile, are addressed to checking whether the letter and spirit of those regulatory requirements are being satisfied on a continuous basis, to conducting forensic analysis of the safety and soundness of banks, and to requiring remedial action where necessary to achieve regulatory purposes. Such supervisory activities are backed by regulatory powers for the enforcement of rules and the application of standards.¹¹

Prophylactic regimes can reduce the incidence of banking failures but not eliminate them. The history of banking is in no small measure the history of crisis management, going back to the emergence of lending of last resort in the 18th century (or earlier), which was proselytised by the British journalist Walter Bagehot after London’s great 1866 crisis.¹² In the middle of the 20th century, after its 1930s banking collapse, the US introduced deposit insurance. Such schemes were embraced by Europe much later. They typically insure deposits up to some codified limit; pay out after a bank goes into a formal bankruptcy proceeding; are typically funded (up front or *ex post*) by the banking industry; and are able to borrow from government when they have insufficient funds,

¹¹ Think of rules as towards the end of the spectrum enabling, for given inputs, mechanical application (e.g., the capital ratio must be at or above x%) and standards as towards the other end (e.g., the firm must be run prudently).

¹² See Baring, Francis. “Observations on the Establishment of the Bank of England. And on the Paper Circulation of the Country.” 1797. Bagehot, Walter. *Lombard Street: A Description of the Money Market*. New York: John Wiley and Sons, Inc., 1999.

with government recovering its loan from the surviving industry via what is in effect a hypothecated tax. Those features are not universal. For example, while the US scheme is funded up front from the whole of the industry, the UK scheme is not but the industry is levied later (meaning the survivors pay).

Deposit-insurance schemes can deter runs of *insured* deposits and so avoid the need for LOLR (to help such creditors) provided that, in addition to the capacity of the scheme to pay being completely credible, the deposit insurer has an established, and widely understood, track record of paying out *very quickly* if a bank goes into liquidation or if it is closed and resolved in some other way (see below). Through frequent practice, the US Federal Deposit Insurance Corporation (FDIC) has established such credibility. Even today, however, it seems likely that few other deposit-insurance schemes have the operational capability to make rapid payouts to retail depositors after their bank goes into a bankruptcy process, leaving insured depositors with incentives to run before the shutters come down in order to avoid finding themselves without money for a prolonged and uncertain period. The retail run on Northern Rock in the UK during 2007 illustrates that.

Separately, deposit-insurance schemes obviously do nothing to deter runs by holders of *uninsured* deposits that can be withdrawn on demand or at short notice. This was put beyond doubt when the US LOLR and Federal government intervened to contain SVB's collapse during spring 2023.

During the 1990s, after the crisis in US savings & loan banking institutions, the FDIC used its statutory powers and resources to develop ways of resolving distressed banks that avoided liquidation of the whole enterprise (see below). Remarkably, few other jurisdictions did this until after the 2008 global collapse. But by then it had also become apparent that new resolution techniques were needed for what became known as systemically significant financial institutions (or SIFIs, a label and concept that has risked obscuring as much as it illuminated: see below). For all such techniques, LOLR facilities and assistance remain germane but in ways that, arguably, the authorities are yet to embrace.

The next two subsections elaborate on, respectively, authorisation and prophylactic supervision and, then, banking recovery and resolution regimes in order to bring out the interconnections with central banks' liquidity reinsurance.

The key features of banking supervision

At the level of regulation, the starting point is authorisation (or licensing) to operate as a bank. This matters because a jurisdiction's statutory regime typically provides that, once in, a bank has continuously to meet the criteria for authorisation, and the regulator can take action (including revocation) where the bank does not do so. This is immensely important for a LOLR.

The standard thinking about lines of defence against losses and against the recklessness, imprudence, dishonesty or bad luck of management was traditionally to require a minimum level of financial soundness, buttressed by standards for internal and external checks and balances. Until the GFC, nearly all jurisdictions relied upon requirements for equity capital and concentrated exposures. There was no quantified minimum requirement for liquidity risk, only various guidelines for prudent management. That changed when the Basel Committee agreed its members would introduce requirements for holdings of unencumbered high-quality liquid assets (the Liquidity Coverage Ratio, or LCR) and for maturity mismatches (the Net Stable Funding Requirement, or NSFR).

While some academic commentators have suggested the two requirements duplicate each other, policymakers (certainly including the writer) saw things differently. The NSFR makes a liquidity crisis less likely as, in normal circumstances, cash flows in broadly when it flows out. The LCR, by contrast, helps buy time when, for whatever reason, withdrawals accelerate. The idea (for me) was to give management (with supervisors) an opportunity to get their act together while, at the same time, being able to demonstrate to market counterparties that they have liquid assets. As discussed below, it is

important to keep this in perspective, not least because the LCR does not require banks to carry anything like enough high-quality assets to cover all their short-term liabilities and obligations.

Prophylactic supervision

The central problem of banking regulatory regimes, however, is that individual banks have incentives to take more risk than is consistent with the micro-regulatory requirements that supposedly bind them, especially if they believe (and believe others believe) that the system as a whole is robust. The best that supervisors can do is to deter such hidden actions, as economists call them, and to promote remedial actions when material problems are identified or emerge.

In pursuance of the prophylactic function, regimes for routine supervision variously incorporate some combination of the following, *each of which applies directly and indirectly to liquidity*:

- Off-site collection, checking and analysis of statistical and other returns;
- Off-site meetings with management;
- Permanent on-site examiners (notably, in the US);
- Occasional on-site inspections, which might be ad hoc or structured or a combination of the two;
- Boards testifying to the integrity of risk processes and governance;
- A power to appoint external experts to review part(s) or all of the business;
- Stress testing (since the 2007-09 global crisis); and
- Rating the strengths and weaknesses of each bank drawing on those inputs.

In recent decades, supervision has generally shifted to focussing on systems and controls, as a backstop to management and audit functions. This often

entails approaching the analysis of balance sheets and profits with a high degree of trust. While, personally, I am sceptical that this can suffice, preferring judgmental forensic financial analysis, it probably remains the mainstream view.

Whatever the mix of techniques¹³, two points need to be stressed.

First, effective prudential supervision requires a lot more than checking compliance with rules. It requires forensic analysis. This is especially important for analysing financial soundness, including liquidity. For example, it matters enormously if a bank's business model means that assets are likely to have to be pledged as collateral to capital-market and other counterparties in stressed conditions, as once encumbered in that way they are not free to be pledged to the central bank in the event that LOLR is needed.¹⁴ It was in that spirit that the European Banking Authority moved to requiring banks to report an encumbrance ratio.¹⁵

Second, as regulators and supervisors frequently emphasise, few jurisdictions want a zero-failure regime, as that would mean requiring extremely high levels of equity and would tend to insulate incumbents from competition, dampening the market forces that can drive welfare-enhancing innovation in payments and credit services. In consequence, I am not familiar with any system where the intensity of supervision is sufficient to rule out problems.

¹³ There is no standard combination of those supervisory tools listed above. For example, while the US has traditionally favoured permanent on-site examiners, the Bank of England traditionally made no use of that technique (partly due to the risk of capture) but relied on off-site analysis and discussions, which these days it supplements with regular but targeted on-site inspections. Part 3 will advocate how pre-positioning collateral can reinforce both approaches.

¹⁴ My very first policy paper, written while a junior line supervisor after some small bank failures in 1981 or '82, proposed that Bank of England supervisors monitor what I called a "wind-up ratio" calculated as the ratio of unencumbered assets to insured deposits. (It was not adopted.)

¹⁵ A recent report can be found here:

https://www.eba.europa.eu/sites/default/documents/files/document_library/Risk%20Analysis%20and%20Data/Risk%20Assessment%20Reports/2022/1036110/Report%20on%20Asset%20Encumbrance%202022.pdf

Remedial actions, recovery, and resolvability

That provides the warrant for supervisors' next function: requiring and overseeing remedial actions. It is not uncommon (but not universal) for statutory regimes to require supervisors to be pro-active; what is known in the US as "prompt corrective action" (PCA).

The standard remedial toolkit, all of which needs to be backed with statutory powers, includes:

- Directing a bank to take some specific actions;
- Constraining new business/ transactions or the management of existing transactions/positions (generally or of particular types); and
- Putting in new management (where the supervisors conclude the incumbents cannot be relied upon to effect the necessary remedial programme).

Any bank that needs remedial action is exposed to a crisis of confidence, and hence a liquidity run, if its problems (or the remedies) become known. The LCR can help absorb the immediate pressure, but that might not be enough. Experience shows that even where a bank or dealer has a sizeable stock of highly liquid assets (as some of the US dealers did in 2008), they can be used up very quickly once a generalised run begins. What matters is the size of the stock relative to on-demand and other short-term liabilities. To pick only one facet of the LCR, it requires a tiny fraction of retail checking-account deposits to be covered by high-quality liquid assets, so the war chest can be exhausted in a moment.

Nevertheless, that buffer, almost however quickly depleted, can provide precious time for the firm's management, its board and the authorities to think. The value of that time to think is lower unless there already exists a clear, pre-programmed plan for recovery and resolution, which at worst provides a benchmark for comprehending the nature and severity of the problem.

Bank resolution, government bailouts, and LOLR

Closing a bank's doors deprives customers of the bank's services. The private and social costs depend, among other things, upon the nature of the services. If a bank is a major provider of current (checking) accounts to households and firms or/and of working-capital finance to businesses, those households and firms are deprived of a means of making payments and of meeting timing differences between cash inflows and outflows. If they relied on that bank alone for such services, they are in a terrible situation: unable to shop for necessities and unable to conduct their business until they have opened an account and arranged facilities with a new bank. Their predicament will knock on to others to a greater or lesser extent, but even when the spillovers are immaterial the predicament of the customers is dire.

The considerations are different when a bank mainly serves rich customers — either large organisations or rich households — who already have other banking facilities, and hold a significant proportion of their wealth elsewhere. In those circumstances, the first worry for the authorities are the social costs, summarised above, of the ailing bank's measures to stay alive (asset fire-sales and lending cutbacks). Closure can attempt to cure that by freezing the business, with a liquidator calmly disposing of assets over a protracted period, but only at the risk of sparking social costly contagion via the hit to counterparties and others through delays in servicing ongoing contracts.

In terms of the lives of citizens, the first is essentially a case of direct hardship, the second of indirect hardship. Although stylised, the distinction is vital for policy, including LOLR policy. In the former case, policy makers will want to find a solution to the firm's distress, in the second to its spread. The most important example of the latter occurred in London in 1866. The Bank of England let the house of Overend Gurney fail but rapidly provided lender of last resort assistance to the rest of the market. Another such example is the closure of Barings in 1994, when the Bank of England announced that facilities were available for others; they were not used. In both cases, the strategy worked.

But sometimes the best way of containing contagion is to avoid the collapse of the first domino. Arguably, the best example of that is the rescue of Barings in 1891, coordinated by the Bank of England but very much on prime minister Salisbury's say so (and with an indemnity for the Bank).¹⁶

In all those examples, the state acted, and did so powerfully. Indeed, whether the most significant costs are felt directly or indirectly, it would be extraordinary for a country's authorities casually to allow closure rather than trying to find ways of sustaining some or all of an ailing bank's services and activities. That is the origin of deposit insurance, special bankruptcy regimes, and rescues of various kinds. Typically, the goals are to have a regime that is capable of:

- 1) Forestalling a panic that was not warranted by the distressed firm's fundamentals
- 2) Creating time for a firm's management, board, shareholders or third parties to cure the fundamental problems that triggered (or, if the action is pre-emptive, might trigger) a run
- 3) Enabling an orderly wind down or transfer of some parts of, or even of all of, the business so as to contain the social costs of its distress
- 4) Preserving a vital part of the economy's financial system or infrastructure where, for whatever reason, barriers to entry are high.

The biggest choice, in general and in any particular case, is whether or not a state will use its own resources (broadly, taxpayers' resources) in pursuing those objectives. Where so, that might include nationalisation, injecting equity, injecting debt instruments convertible into equity, publicly guaranteeing all or some of the liabilities of distressed banks (and affiliates), and lending secured or unsecured. Such resources might be deployed directly by the central organs of the state (the treasury), or specialised agencies. Such specialised agencies

¹⁶ See pages 20-21 of Tucker, Paul (2020) "Solvency as a Fundamental Constraint on LOLR Policy for Independent Central Banks: Principles, History, Law," *Journal of Financial Crises*: Vol. 2 : Iss. 2, 1-33.

might include a deposit insurance agency, sundry special vehicles, and the central bank. To comprehend LOLR, it is vital to start by thinking of it merely as one possible vehicle for mobilising state resources and capabilities. The starting point should be that, given our political values, a decision whether or not to bailout a bank is unavoidably one of political discretion, involving balancing short-term and longer-term political and economic considerations.¹⁷

I believe a prime minister and finance minister, at least in a constitutional democracy, would weigh a range of general considerations in deciding whether to rescue a firm in some way, or to permit other agencies to do so. Although I am for the moment abstracting from the division of labour among treasuries and central banks, these considerations bear on what kind of LOLR regime a democratic government would create or tolerate, whether delegating authority or exercising direct control. They are:

- The consequences for the financial system's stability of not acting to preserve the firm;
- The wider consequences for the domestic economy, including in particular jobs, and with attention to regions or sectors of the economy that are politically potent or salient;
- The likely fiscal costs of a bailout, including whether (in some way) rescuing bank X now would use up so much fiscal capacity as to require early fiscal retrenchment or leave the state unable to bailout others later if the situation deteriorated;
- The likely short-term political costs of a bailout, including whether ministers could explain it to the public/parliament/party/cabinet;
- Whether an intervention has a good chance of succeeding. The greater the chances (and so political costs) of failure or of having to go back and do more, the greater the economic and political costs of not acting would have to be; and
- The implications for socially costly risk-taking behaviour among intermediaries, investors, households and non-financial businesses if an

¹⁷ This is quoted from one of my other papers, but I now cannot find which one.

expectation of being bailed out becomes embedded in the system (moral hazard).

Partly because of the moral-hazard costs and partly because bank crises are rare, few if any countries have articulated a bail-out policy.¹⁸ Instead, going back many decades, advanced-economy governments have, through design and improvisation, found ways to push the management of banking crises away from quotidian politics. The narrower an elected (executive) government's discretionary fiscal powers and the harder it is for the executive to get emergency measures through its legislative assembly, the more powerful the incentives to find arm's length institutional solutions. It is not surprising, therefore, that the most notable route — special resolution regimes — first developed in the US, where legislative politics is especially sclerotic. And even there, before the GFC the FDIC-managed resolution regime did not extend to bank holding companies or to non-bank financial institutions such as broker dealers (e.g. Lehman). European countries such as the UK could not manage an orderly resolution for even simple medium-sized banks, such as Northern Rock, without emergency legislation.

As the GFC progressed, some jurisdictions passed legislation to give their financial authorities some basic resolution powers. Afterwards, on the initiative of the Financial Stability Board (FSB) and others, G20 leaders agreed that jurisdictions should have a much fuller range of special-resolution powers.

Purchase & Assumption, bridge banks, and LOLR

On substance, it is worth summarising what the resolution of standard banks canonically involves. The classic technique, developed by the US FDIC, for

¹⁸ While in office, I called this the elected government having a (stable) policy on Capital of Last Resort: Tucker (2009), "The Repertoire of Official Sector Interventions in the Financial System: Last Resort Lending, Market-Making, and Capital," Tokyo 28 May 2009, Bank of England: <https://www.bankofengland.co.uk/-/media/boe/files/speech/2009/last-resort-lending-market-making-and-capital.pdf> (Given moral hazard, it is easy to understand why no one broaches the subject, but maybe a COLR policy could come with penalties attached.)

relatively simple banks is known as Purchase & Assumption (P&A). It involves an agency endowed with special powers taking a bank into a resolution process. The agency transfers some of the liabilities and, perhaps, some of the assets of the distressed bank to another, healthy banking institution. The transferred liabilities invariably include the insured deposits, which ensures they are at least as well protected as if the bank had gone into liquidation.¹⁹ In consequence, on the next business day (usually, a Monday) the insured depositors of the failed bank discover they are now depositors of another bank. Everything that is not transferred to a living bank — both liabilities and assets — goes into a bankruptcy procedure.

P&A resolutions require resources to pay the transferee bank to assume the failed bank's insured liabilities. Those resources typically come from the deposit-insurance fund, which would otherwise be paying out in a liquidation. But such funds are rarely large enough to cope with the payout (and, hence, a P&A resolution) of a vast bank with vast insured liabilities. They can also prove insufficient where, as in the SVB case, the authorities judge that a large amount of uninsured deposits need protecting. To be clear, though, this is not about resources for lending, it is about transferring resources outright. Plainly that can help alleviate liquidity strains, but it is not a loan. Deposit-insurance funds and, where distinct, resolution funds are not the same kind of thing as LOLR assistance.

Typically there is no role for the LOLR in a such resolutions, but it is not impossible. For example, maybe the market reaches the view that the acquiring bank is afflicted by the same kind of problems that brought down the failed bank, or maybe it gets infected by buying assets from the failed bank that turn out to be bad, or maybe some of the transferred depositors decide they want to hold their money in currency. The point is that for the LOLR, this presents the same issues as whether to lend to any open bank suffering a liquidity run. In certain circumstances, therefore, the central bank would provide a liquidity backstop for a P&A resolution.

¹⁹ Resolution laws typically stipulate that any solution must not leave anybody worse off than they would have been had the bank gone into liquidation. The deposit-insurance agency and the resolution agency can be the same body (as in the US), or separate (as in the UK).

There is a variant of that kind of operation which is important for this report. If, although aiming for a P&A solution, the resolution agency cannot immediately find a purchaser/transferee for the insured deposits and so on, the resolution agency can put them plus, perhaps, other contracts and property into what is known as a “bridge bank,” with a view to selling it or transferring all or part of its property and obligations in due course via some kind of auction process. In effect, the agency is warehousing all or part of the business while it searches for potential acquirers. The bridge bank needs funding. In the US, such vehicles have typically been funded from the deposit-insurance fund (an option that is available only where the insurance scheme is funded), and elsewhere by the Treasury (or other state vehicles). But, as noted, those sources of funding might be inadequate if the distressed bank were vast, or there were lots of smaller banks in bridge companies at the same time.

I suggest that there is no reason in principle why a bridge bank should not seek emergency funding from the central bank, and there are easily imaginable circumstances (involving vast numbers) where that will be the only feasible solution, at least in the short run. Whether that is currently feasible in any particular jurisdiction is a question of law, but we can say at this stage of the report that borrowing from the central bank is at least a conceptual possibility. In doing so, it is important to underline — although this is very rarely said — that transferring a distressed bank’s business (its contracts and property, and so on) into a bridge bank of the resolution agency is, in effect, an act of temporary nationalisation. We return to a variant of this below.

Bailin, and LOLR

For reasons that need not detain us for long, after the GFC the international community concluded that it could not rely upon the P&A technique for resolving especially large and complex banks. It was essentially because some banks have large uninsured deposits from intermediaries and others that are

integral to the financial system (entailing direct-contagion risk), and because some banks perform quasi-infrastructure functions that could probably not be withdrawn suddenly without clattering systemic distress.

The model developed by the international community is, broadly, to put losses exceeding equity onto some deeply subordinated bondholders and to have groups structured so that this can be achieved without damage to operational liabilities (pre-eminently deposits but also wholesale trading-related obligations.). The approach is, therefore, profoundly different technically from the resolution technique employed for modest sized, vanilla banks. Because P&A involves splitting a bank into its critical and non-critical parts, it is not feasible where (a) the critical and non-critical activities cannot be identified ex ante and/or (b) they could not be disentangled in the heat of a crisis.

By contrast, the resolution technique envisaged for SIFIs --- known as bailin --- works essentially as follows.²⁰ A financial group is to be structured so that it is clear whether it would be resolved as a whole under the control of its home authorities or, alternatively, as a series of clearly defined regional (or country) subgroups under the control of relevant host authorities, with home-authority coordination of the plans taken as a whole. The former is known as single point of entry (SPE) and the latter as multiple point of entry (MPE).

Once either a group as a whole (for SPE) or a systemically significant subgroup (for MPE) is in severe distress, two steps are involved in its resolution. The first involves transferring losses exceeding a subsidiary's equity (its "excess losses") to its non-operating parent (the group or subgroup holding company). In essence, that is achieved by having key subsidiaries --- domestic and overseas --- issue super-subordinated debt to their parent. The subsidiary's solvency is restored by the authorities triggering the writing down and/or conversion into equity of as much as needed of that intragroup debt. The subsidiary is thereby recapitalised without having to go into a bankruptcy or resolution procedure.

²⁰ See Financial Stability Board, *Guidance on developing effective resolution strategies*, July 2013; and Tucker, "Resolution and the future of finance", Bank of England May 2013.

That done, with the excess losses transferred up to a group/subgroup's top company, the second step is to ensure that that holding company can in turn be resolved in an orderly way if it is mortally wounded. This requires that financial-group/subgroup holding companies maintain in issue to the financial markets a critical mass of bonds that can be 'bailed-in' to cover losses and recapitalise the group to the required equity level.²¹ The holders of those bonds become the new owners (of the group as a whole for an SPE banking group, or the relevant resolved subgroup for an MPE group).

Although the bank is recapitalised, there might still be a run on Monday morning, especially the first few times the technique is used. The central bank LOLR should be ready to lend to the resolved group provided it believes the recapitalisation is adequate. In consequence, its collateral haircuts (see below) effectively put a lower bound on the scale of the debt-to-equity conversion that the resolution authority needs to deliver and that prudential supervisors need to plan for.

Conservatorship and LOLR

The maintained assumption in discussing those two resolution techniques is that a bank is either (a) already balance-sheet insolvent or (b) is heading that way with no realistic prospect of recovery, and equity holders (and possibly others) are set to get wiped whether in a bankruptcy procedure or special resolution. But there is another set of circumstances — one conceivably germane to cases like Credit Suisse's unravelling. Namely, that a bank is well capitalised but suffers reputational damage of such cumulative severity that customers take their business elsewhere, triggering simultaneous runs on the firm's franchise and liquidity. Here a different kind of technique might be deployed, where the business is removed from the control of board and top management, shareholders rights are suspended, and an agent of the state is

²¹ I have favoured such bonds being issued in (and under the laws of) the jurisdiction in which the holding company is domiciled, as that helps avoid conflict-of-law and conflict-of-regulatory-jurisdiction issues. Elaborating on that is beyond the scope of this report.

appointed to run off the business (including auctioning parts of it) or turn it around.

In the US, this is known as conservatorship.²² Variants have been used elsewhere, including the UK. Indeed, a bridge bank structure, which remember involves temporary nationalisation, could be used to the same end provided the resolution authority had the requisite set of legal responsibilities and powers.

The point here, once again, is that the central bank might fund a bank in conservatorship, acting as the LOLR. At the least it could do so temporarily, and on whatever scale was needed and subject to the availability of collateral or a government guarantee, until the government-controlled bank/banking group could itself borrow on the back of the government guarantee. In the EU, the Commission waived state aid requirements during the GFC to allow something like that on a number of occasions.²³

Summing up: resolution planning and the central bank LOLR

Summing up the discussion of resolution's connections with LOLR, no resolution plan for a specific firm/group is adequate without incorporating firm LOLR plans, and no resolution regime can be adequate if it does not require the authorities to meet that test. Moreover, that liquidity-providing role must, ultimately, be fulfilled by the central bank. Developing an earlier point, while all sorts of other government organs, not least the finance ministry itself, can mobilise some quantum of resources at short notice, every one of them faces constraints. A finance department reaches a point where it must borrow on the markets. It might struggle to issue treasury bills of the value of, say, SwFr 0.5 trillion in a single day; and even if it could, the few hours delay until

²² For a summary by the International Monetary Fund, see <https://www.elibrary.imf.org/downloadpdf/book/9781616350277/ch04.pdf>

²³ How effective they were depended upon the incentives of the new managers, which is beyond the scope of this report. The point here is the potential involvement of the LOLR in this technique, which lies somewhere between open-bank recovery and resolution (with equity etc wiped out).

settlement might be fatal. The central bank merely creates the money, at next to no notice, sterilising any unwanted monetary effects on a more leisurely timetable (whether hours or days).

That being so, the consensus (reflected in a 2018 G20 Financial Stability Board document) in favour of resolution planning including liquidity planning entails that central banks be involved in resolvability assessments except where other bodies can credibly commit to provide resolution funding on the necessary scale.²⁴ For SIFIs, that condition cannot possibly be satisfied given the gigantic scale of their runnable liabilities. The FSB Key Attributes (KAs) stipulate that, for SIFIs, resolvability assessments be signed off every year by top officials.²⁵ For SIFIs, those top people plainly include the central bank's top permanent official.

PART 2: CENTRAL BANKS AS LENDERS OF LAST RESORT

So far, LOLR policies and practices have been placed in the context of the wider array of other state policies to preserve banking system stability. This Part of the report discusses the LOLR more directly. It begins by locating LOLR operations within the broader range of a central bank's monetary operations, and how they affect the public finances. It goes on to explain the very different purposes central bank lending can serve, and the main features of a LOLR regime designed to help preserve financial system stability. Those features include the importance of the borrower being solvent, how ELA fits into a LOLR

²⁴ See, FSB, *Funding Strategy Elements of an Implementable Resolution Plan*, 21 June 2018.

²⁵ FSB, *Key Attributes*, 11.11 (with my emphasis): "The substantive resolution strategy for each Global-SIFI should be subject, at least annually, to a review by *top officials* of home and relevant host authorities and, where appropriate, the review should involve the firm's CEO. The operational plans for implementing each resolution strategy should be, at least annually, reviewed by appropriate senior officials of the home and relevant host authorities." Those words were proposed (I helped draft them) and accepted (after the FSB Plenary meeting discussed them) because each jurisdiction's authorities needed credibly to signal to their peers that resolution plans would be serious and authoritative, with no question of top officials overruling or side-stepping plans agreed among middle-ranking officials. In other words, it was about incentives and accountability. I should record that I have not asked the Swiss authorities whether each top official did sign off.

regime, eligible counterparties, eligible collateral (including haircuts, and pre-positioning), the complexities introduced by banking groups with multiple legal entities, and the LOLR's dependence on prudential supervision, resolution authorities, financial ministries, and so on.

LOLR operations as one element in a central bank's monetary regime

A central bank is a machine for issuing the money that is the final settlement asset in a monetary economy. It alters the amount of this money that is circulating in the economy via financial operations of various kinds, and does so for essentially two purposes: price stability and banking-system stability. The two fit together because most of the money in a modern economy is issued by commercial banks.

Central bank operational regimes

For purposes of exposition, a very stylized summary of central bank operations will be useful when introducing the concept of LOLR operations. The initial discussion will prove inadequate, but it is easier to argue our way to a richer account than to start with it.

Regimes for central bank operations in their own currency have three broad features. First, a class of banks holds reserve accounts with the central bank; call them "reserves banks". In some jurisdictions, that class comprises all de jure banking institutions, whereas in others it is a subset of all banks. Where it is a subset, some banks bank with a reserves-holding bank rather than with the central bank itself.

Second, central banks conduct open market operations (OMOs) in which they transact in the market — these days typically via structured auctions for

eligible counterparties — either to buy assets outright or, more usually, to lend against the security (collateral) of bundles of financial instruments.

Third, reserves banks (and sometimes others) are able to borrow from the central bank (against collateral). Such facilities have carried various labels in different places at different times, including “Lombard loans,” “discount window lending,” “standing lending facility,” and so on. What they are, and they differ substantively, is more important than the words. For the moment, I shall call them all discount-window loans.²⁶

A central bank can lend secured by taking a fixed charge over specific assets, (much more rarely) a floating charge over a category of assets, or, more frequently for some decades now, via sale and repurchase agreements (known colloquially as “repo”). The significance of repo is that if a counterparty defaults, the central bank owns the “collateral” outright and, subject to some important procedural formalities, can sell the instruments in the market rather than making a claim, as a secured creditor, in a bankruptcy proceeding.

Despite their formal similarities, discount window loans and OMOs typically differ commercially (for the borrowing bank) and policy wise (for the central bank, and therefore for the public on whose behalf it acts) in a number of respects. Discount window operations are bilateral operations in which individual banks have a right to draw funds subject to certain conditions (such as being sound, and providing eligible collateral). By contrast, OMOs are auctions in which a population of eligible counterparties typically compete against each other for a share of a fixed quantum of funds. Further, and vitally here, while OMOs are typically offered in amounts designed to meet the market’s aggregate *net* demand, assuming reserves will be distributed by the private money markets to where they are needed, discount window loans are potentially unlimited, which can lead to the central bank needing to sterilize the injection of base money so as to maintain its desired monetary policy stance. All that will seem pedestrian to those familiar with central banking

²⁶ I am ignoring intra-day lending in real-time gross-settlement (RTGS) payment systems, which matter hugely to central banks avoiding uncollateralised intra-day credit exposures to banks, but the omission affects nothing in this report.

operations but will turn out to be vital to designing and operating a tolerably fit-for-purpose LOLR policy.

In a similar spirit, it needs to be said before going further that most central banks do (and, as I argue in Part 3, normatively should) publish the terms of their various facilities. But, in the real world, their published regimes rarely exhaust what they end up doing in extraordinary circumstances. Where such beyond-regime operations involve lending to help banks (or others), they can be labeled Emergency Liquidity Assistance (ELA). Over the past couple of decades, it has become common to equate ELA with LOLR operations, but that is a mistake.²⁷ Some LOLR operations are conducted within the terms of published regimes, while others are not (as discussed below).

Central bank operations, risk, and the public finances

All central bank financial operations with the private sector change the structure and/or size of the state's consolidated balance sheet. If it buys only government paper, the structure of the state's consolidated liabilities is altered but its size is left unchanged, because one organ of the state (the central bank) has bought the liabilities of another (central government). Monetary liabilities are substituted for government's longer-term debt obligations.

If, by contrast, the central bank purchases private sector paper or lends money to the private sector, the size of the state's consolidated balance sheet increases, with monetary liabilities being added to the government's outstanding debt. In addition, and critically for this report, the risk structure of the state's consolidated asset portfolio shifts. If and when those risks crystallise, the losses (or profits) flow through to the public finances via the

²⁷ My recollection is that this elision was prompted by the deliberations of a Basel working group that felt "LOLR" was too vague or ambiguous. I was not on the group but felt then what I feel now: that this was both a mistake and a retrograde step, not least by associating all LOLR operations with a desperate emergency whereas, properly designed and operated, that need not be so. My use of "ELA" here fits with regarding it as what central banks do when their best laid plans are exhausted, but for that use to work there must be well laid plans and regimes (Part 3).

impact of seigniorage due to the government, any dividends, any guarantees or indemnities, and so on, the details varying from state to state.²⁸

Partly for that reason, most central bank lending is secured. Not all their secured lending is LOLR, but pretty much all LOLR is secured lending of one kind or another.

The varying circumstances and, so, purposes of liquidity reinsurance

Today, as indicated, in many jurisdictions there is a distinction between:

- Facilities, bilateral or auction-based, that are routinely available on published, standardised terms to eligible institutions provided that certain conditions are satisfied, and
- “Emergency liquidity assistance” (which I am going to treat as a term of art) beyond the terms or scope of those routine facilities but still subject to certain conditions being satisfied.

Thus, crudely summarising, the US Federal Reserve has a Discount Window available to banks, with harsher terms for weaker banks, and may also lend to others with the express consent of the Treasury Secretary in “unusual and exigent” circumstances. In the UK, since autumn 2008 the Bank of England has had a Discount Window facility, but may go beyond both that and its other published facilities with the permission of the Chancellor of the Exchequer. In the euro area, the ECB has a short-maturity Lombard Facility for banks, and conducts regular auctions where it lends to banks at term maturities against a wide range of collateral, but the national central banks may also provide emergency assistance to distressed banks under restricted circumstances.

²⁸ The Swiss central bank has private shareholders as well as public sector (federal and cantonal) shareholders. That is ignored here, partly because the Swiss government has not ask for advice on it, and also because I want to discuss the constraints of orthodoxy.

This simple way of thinking about things can, however, lead one astray. Both the general description and the examples obscure the important fact that banks can need liquidity assistance for quite different reasons, which bear (or, more accurately, ought to bear) on the terms of the facilities they access. Those reasons for needing liquidity help include the following.

First, a perfectly healthy bank might hold insufficient reserves on its reserves account with the central bank given the requirements of the central bank's monetary regime. Without getting into the manifold complexity of monetary regimes, this constraint can take two forms. One involves avoiding being overdrawn at the central bank on any specific day (if a positive balance is a daily constraint). The other involves avoiding falling short of a monetary maintenance-period target balance, and so needing to borrow at (or towards the end of) the maintenance period.²⁹ In both cases, a bank that risks falling short borrows from a facility in order to avoid the more punitive costs of being overdrawn or falling short of a reserves target. Those punitive costs can be financial and also reputational, since a bank that goes overdrawn or misses its target is not running its treasury function professionally, creating the possibility that of more significant accidents signalling a bank is in difficulty even when, in fact, it is not. Although technically this involves borrowing from the central bank as the final source of reserves, it does not warrant the label LOLR as it is not a support operation to a bank (or banks) under pressure.

Second, a basically healthy bank (or banks) might be subject to an unwarranted run that, if unchecked, would likely become self-fulfilling as the bank(s) sold assets at a discount in order to meet its (their) obligations.³⁰ The central bank lends in order to enable the bank(s) to meet their obligations, and also to demonstrate that it is confident the bank(s) is (are) sound. Such lending might be widely publicised. This is a LOLR operation.

²⁹ Many central banks have an operational regime that involves reserves banks needing to maintain a specific target balance on average over a reserves maintenance period that runs from one monetary policy meeting to the next; an approach that depends on monetary policy being decided at scheduled, periodic meetings. In addition, many central banks charge extra high penalty rates for being overdrawn on any particular day. That makes sense only if the central bank wants to incentivise active day-to-day liquidity (reserve) management by the banks.

³⁰ That is the subject of Diamond Dybvig, *ibid.*

Third, a bank might be facing liquidity strains because it genuinely does have problems. In this case, the very fact of lending does not cure the problem but LOLR assistance can buy time for a solution to be found and effected. Those solutions can vary enormously. They include sale of the whole of the business; orderly run down, including sale of parts of the business or specific assets; equity injections by existing owners, or new private investors; government financial support; entry into a bankruptcy or special resolution procedure. Where central bank lending is part of the attempted solution, it is plainly a LOLR support operation.

In that third type of case, the set of feasible solutions to which LOLR assistance provides a bridge depends on the nature and gravity of a bank's fundamental problems. The most obvious drivers are financial losses that have impaired or are likely to impair a bank's common equity resources, even undermining its solvency. But a bank can become unviable, prompting a run, for other reasons. Notably, if a bank is associated with serious compliance problems or scandals, some customers and counterparties might decide to take their business elsewhere. That can spiral into what amounts to a run on the franchise, with some customers deciding that they cannot justify continuing to transact with the bank once some of their peers are known to have moved elsewhere. Such reputational-risk spirals have to date been relatively unusual but do occur. It is what happened to the Arthur Anderson accounting firm after the Enron scandal in the 1990s. When something like that happens to a bank, it can also involve the withdrawal of funds; for example, wealth management clients decide they should move elsewhere, and so transfer their moneys to another intermediary. Although sparked by concerns about reputational risk or service quality, this can kick-off a straightforward liquidity run, as perhaps in the Credit Suisse case.

Distinguishing between liquidity facilities serving different purposes

With that three-fold distinction, it becomes possible to say that modern central banks' design of liquidity-insurance facilities has been dominated by thinking

about the first of those purposes. This is evident in what used to be the standard maturity of discount-window loans: one day. While that makes good sense when the problem is a temporary, technical reserves shortfall, it will rarely suffice for the second kind of problem, and hardly begins to scratch the surface of the third kind of problem since it would buy only one day for a fundamental solution to be identified, negotiated (if necessary), and executed. In those circumstances, therefore, overnight loans have to be rolled over day after day. If putting the bank into a bankruptcy proceeding is a realistic option, keeping the bank on the edge of a precipice might sometimes be useful in getting management to agree to various remedial measures. On the whole, however, it will be preferable to lend for a longer term, subject to rights of early recall (if, for example, it becomes clear that the attempted solution is unlikely to work).

This has an important implication for the design of LOLR facilities. Namely, that it is not sensible to rely on an overnight lending facility, especially if such lending has to be against the highest quality collateral (domestic currency government bonds), unless a jurisdiction wants all LOLR support operations to be discretionary ELA. For precisely this reason, since late 2008, the Bank of England has distinguished between two facilities:

- A purely frictional Operational Standing Facility, the principal aim of which is to support rate-setting by absorbing essentially technical frictions in the overnight money markets;³¹ and
- a Discount Window Facility, the principal function of which is to provide liquidity insurance in the event of stress.

Other major central banks, including the ECB and the Fed, have not taken that step; and the SNB has the first but not the second type of facility (Annex A and Part 4). But whether or not the two types of facility are formally separated, the different functions have an important implication for how the central bank

³¹ Again, I am ignoring intra-day lending in RTGS payment systems, although it matters that the collateral eligible for such lending is not broader than for the overnight facility.

acts. Liquidity help designed to help steer the overnight rate of interest must be provided in cash (reserves). By contrast, liquidity assistance to help a distressed bank could be provided by lending high-quality assets (government bonds) against riskier collateral (known as a collateral swap). The liquidity-stricken firm(s) can then use the borrowed high-quality bonds in private repo markets or in the central bank's open market operations to get cash.

Public facilities providing liquidity insurance to stressed banks

The distinction drawn between facilities to steer the overnight rate of interest in line with the policy rate and facilities to help stressed banks highlights the question of why there should be standard facilities of the second kind at all, as opposed to relying entirely on discretionary ELA, and what form any such facilities should take.

The core of the answer to first part of the question concerns planning and credibility. Making a facility public means making its terms public, with an implied or express promise that the terms will be stable. This has advantages for both central banks and commercial banks. For central banks, it means confronting design questions in advance, when conditions are calm rather than fraught (operationally and politically). For commercial banks, it means the terms of trade are clear. Uncertainty on the availability and terms of any unscripted ELA persists, but some opacity is removed.

The stigma problem, improvisation, and OMOs

Separate from drawing the line between the public regime and ELA is the question of whether liquidity help from any published regime should be provided bilaterally or via auctions (to a class of eligible counterparties). The basic argument for the latter is that lending via auctions to many firms reduces (without eliminating) the likelihood that a needy firm will be damaged by

borrowing from the central bank even if it is basically healthy (adverse selection, see Part 1). This is known as the stigma problem, which has afflicted many central banks. Especially conscious of this, in late summer 2007, the New York Fed launched the Term Auction Facility, which was basically an auction version of its Discount Window (and, as such, was not formally an emergency measure requiring special approvals). The ECB was already conducting wide-collateral OMOs before the crisis, and simply needed to expand them and lengthen their maturity.

Notwithstanding that serious advantage in providing help via long-term repo auctions, there are benefits in also having a facility where firms can borrow bilaterally. In the first place, auctions are typically periodic (monthly, fortnightly, weekly), whereas a bank might suddenly face difficulties on any day. Even if auctions were daily, that won't help if a run starts in the afternoon but that day's auction was held a few hours before. Further, auctions are routinely for a set aggregate amount. While central banks can increase auction size in stressed conditions, or even put no limit on the funds available, doing so might signal that somewhere in the system unknown individual firms are distressed if market-wide conditions are not notably stressed. Finally, bilateral borrowing makes it easier for a central bank to initiate or deepen dialogue on the bank's condition and circumstances (which, of course, is related to the stigma problem).

While the details differ, the main central banks have in the main moved to having both a facility for bilateral lending against a broad class of collateral and holding repo auctions (Annex A). Following the GFC, the Bank of England offers regular wide-collateral, long-term-repo auctions as well as having a Discount Window for borrowing out to 30 days, renewable, against a still wider list of collateral. The ECB pioneered regular long-term repos against securitised loans, and has a standing facility for borrowing against wide collateral but only overnight (indicating that it is seen as a monetary policy instrument). The Fed led the way, many years ago, in having a wide-collateral Window but its repo open market operations are routinely limited to lending against government and government-guaranteed paper.

In each case, however, the location of the chosen borderline with discretionary ELA has occasionally left the central bank improvising with temporary published facilities when stressed circumstances rendered their prevailing standard toolkit inadequate. In the US, this led to an alphabet soup of ad hoc facilities during the GFC and COVID-19 crises. In the UK, as well as improvising during crises, the Bank of England has in effect moved the borderline by incorporating into its published liquidity-insurance regime contingency plans for special facilities and auctions. This has included, notably, the Contingent Term Repo Facility, last used in 2020, that are part of its published regime but are not routinely available, being switched on only when and so long as judged necessary.³²

We can think, therefore, in terms of a 2x3 matrix. In one dimension, bilateral facilities versus auctions. In the other dimension, whether any lending (or collateral swap) is conducted routinely as part of a published regime, ad hoc as part of activated contingency plans included in the published regime, or as ELA that is improvised outside the published framework. A crisis might be met with operations in any one of the cells, so I am reserving the term “emergency” for when central banks go off script. This will have normative implications (discussed in Part 3).

Separately, it is worth underlining that, as I am using the term, ELA might be provided via an auction. That is because although the operational distinction between bilateral lending and auctions is obviously sharp, the circumstances that influence the choice form a spectrum. Partly because of the stigma problem, some central banks have sometimes provided assistance to the market as a whole even though one firm needs help a lot more than others do. The need for assistance, and for remedial action, comes in degrees.

³² <https://www.bankofengland.co.uk/markets/market-notice/2020/activation-of-the-contingent-term-repo-facility>

Circumstances for the use of ELA: helping to prevent or contain systemic crisis

How frequently, when providing LOLR support, central banks need to resort to ELA depends on the richness of its published regime, including scripted contingency plans. When the published regime proves inadequate, there needs to be a test for whether to improvise. The general norm is that ELA is granted only if intervention is judged necessary to avert or contain systemic distress entailing unacceptable social costs (see Part 1).

Concretely, the central bank — and perhaps the authorities more generally (see Part 3) — must believe that, left unaided, the firm's distress could bring about or exacerbate a socially costly systemic crisis; and, separately, that ELA would help. Those are difficult judgments, on which reasonable people can disagree, not only at the time but with hindsight.

What will be systemic is almost impossible to pin down in advance. The failure of a medium-sized firm might be systemic if it signals the existence of vulnerabilities running through the system. The failure of many small firms within a short period might deliver a systemic shock in some circumstances; examples include the U.S. savings & loan crisis in the late-1980s and 1990s, and the UK secondary banking crisis in the early-1970s. But the failure of even a globally active firm might pass uneventfully if the general economic and financial environment is benign and its problems are clearly idiosyncratic (Baring's failure in 1994 is a notable example: it went into administration).

The idea of globally systemically significant institutions (G-SIFIs, see above), introduced by the Financial Stability Board after the GFC, was to try to identify those globally active large and complex firms whose failure would be likely to create systemic distress in almost *any* circumstances. But, even for them, there was no sense of entitlement to LOLR support; i.e., that they could just borrow and carry on. Rather, the emphasis was on orderly resolution.

That is partly because, once one is going beyond the published framework, there is no point lending to a distressed firm if doing so would not cure or

contain market stress or, worse, would be likely to be counterproductive. LOLR help (including ELA) is not a device for buying time in the hope than an Act of God will make underlying problems go away. If, therefore, a distressed firm is dangling by a thread, the LOLR aims to help provide a bridge to a more fundamental solution, whether that be solvent and orderly wind down or a private sector rescue of some kind. Where there is nothing at the end of the bridge and no reasonable prospect of a solution emerging, the central bank would be lending into thin air (even if its own financial risks were adequately covered by collateral). That is why the announcement of ELA to Northern Rock in 2007 prompted a retail run (predictably).

That LOLR support is neither functionally nor normatively the same as an equity rescue has important implications for the terms of the lending. If they are soft in some way, the operation might transfer resources (wealth) to the firm. Quite apart from debates about “penalty” rates, an independent central bank cannot itself choose to subsidise a particular firm or firms. That takes us to a more important constraint.

The solvency constraint

The most important constraint on LOLR help *from an independent central bank* is that a borrower should not be fundamentally insolvent. In some jurisdictions, for example the US, this constraint is (now) effectively imposed by primary legislation.³³ In others, it exists as a matter of policy.

At the level of positive (explanatory) analysis, this is intimately connected with the stigma problem (above): Crudely, developing a reputation, valid or not, for being prepared to lend to insolvent firms undermines the effectiveness of LOLR facilities since it fuels the stigma problem (adverse selection).³⁴

³³ A perception that the Fed lent to fundamentally bust firms at points during the GFC met with a lot of concern in Congress, leading to a change in the law in 2010 barring it from lending to non-banks that are insolvent.

³⁴See Tucker (2014), “The Lender of Last Resort and Modern Central Banking.”

But there is also a normative reason for the constraint. The important distinction between fundamentally sound and unsound borrowers arises because time-subordination --- longer maturity claims being repayable after short-term claims of the same class --- exists while a firm is alive but not when it is in bankruptcy. Liquidity assistance to a bust bank allows short-term creditors to be repaid at the expense of long-term creditors of the same rank.³⁵ As former US Treasury Secretary Geithner said in an interview ten years after the Lehman crisis, “To have lent up to the limit of even a generous valuation of Lehman’s collateral would not have prevented failure, it would have just have financed the exit of some creditors at the expense of others.”³⁶

Allowing some creditors to lose out relative to equally ranked creditors is not the kind of choice that an *independent* central bank can decently make, because it does not have the (fiscal) authority to make good any consequential losses incurred by the longer-term creditors.

Restoring solvency and viability

The principle “no lending to fundamentally bust firms” leads to an important question: what if a bank is insolvent right before LOLR help is provided but, via a remedial plan of some kind, can be rendered whole again? Broadly, that is ok. In the strongest case, the problem is not fundamental, and the liquidity intervention works to restore solvency either directly, or indirectly by reviving markets and asset values. In other cases, lending can be ok subject to constraints. Since the LOLR operation facilitating the recovery plan will, with certainty, enable some short-term creditors to escape whole, no longer-term creditors of the same class (or classes) should lose out. That means the recovery plan on the basis of which LOLR is extended cannot involve haircutting longer-term creditors that rank equally with the class(es) of short-term creditors who can escape thanks to the central bank’s help.

³⁵ See pages 8-11 of Tucker (2020), “Solvency as a Fundamental Constraint.”

³⁶ Geithner, Timothy and Metrick, Andrew, “Ten Years after the Financial Crisis: A Conversation with Timothy Geithner,” 5 September 2018. Yale Program on Financial Stability Working Paper No. 2018-01, page 10.

In a similar vein, it is important to underline that the “fundamentally solvent” condition for central bank LOLR assistance is not the same as stipulating, as at times some central banks have, that a bank is ineligible for loans if its regulatory capital ratios fall below the prescribed minimum (or some fixed margin below the minimum).³⁷ Such conditions risk condemning a bank to death, with the risk of attendant spillovers and social costs, even though it could restore its capital position provided it lives long enough to do so.

Concretely, the point can be illustrated by looking at the ECB’s published policy on providing liquidity support to banks with “a capital shortfall”.³⁸ It observes that LOLR “to insolvent institutions and institutions for which insolvency proceedings have been initiated according to national laws violates the prohibition of monetary financing.” More interesting, it goes on to define what will count for these purposes as being solvent:

“A credit institution is considered solvent for ELA purposes if:

- (a) *its Common Equity Tier 1, Tier 1 and Total Capital Ratio as reported under CRR on an individual (if applicable) and consolidated (if applicable) basis comply with the harmonised minimum regulatory capital levels (namely 4.5%, 6% or 8%, respectively); or*
- (b) *there is a credible prospect of recapitalisation - in case (a) is not met, i.e. the Common Equity Tier 1, Tier 1 and Total Capital Ratio, on an individual and/or consolidated basis, do not comply with the harmonised minimum regulatory capital levels (namely 4.5%, 6% or 8%, respectively) - by which harmonised minimum regulatory capital levels would be restored within 24 weeks after the end of the reference quarter of the data that showed that the bank does not*

³⁷ In my experience, this is more likely in those civil-law jurisdictions in which officials feel they must apply mechanical rules to the availability of LOLR. If that is a feature of the Swiss regime, it needs changing (but I have not heard or read that it is).

³⁸ “ECB Agreement on emergency liquidity assistance,” 17 May 2017, paragraph 5.4 (latest version issued 9 November 2020, para 4.1). The ECB policy is about ELA, but this, I believe, is because lending outside the ECB’s published facilities to help ailing firms is, subject to ECB constraints, a task for the euro area’s national central banks (Annex A), and thus is designated “ELA.” Big picture, taking account of the constitutional complexities of the euro area, that is not at odds with my definition of ELA.

comply with harmonised regulatory minimum standards; in duly justified, exceptional cases the Governing Council may decide to prolong the grace period of 24 weeks.”

In other words, the ECB requires that a recipient of liquidity support must either have capital ratios above the prevailing minimum regulatory requirements or, if not, be credibly heading back above those regulatory minima. The most interesting words are “there is a credible prospect of recapitalisation.”

The ECB’s text is silent on the probability threshold for assessing whether a recapitalisation plan is “credible,” but the test would sensibly be more onerous the further an ailing bank started out below the regulatory minima. On that view, the ECB would need to be highly confident that minimum capital ratios would be re-achieved if a potential recipient started with a net-assets deficiency (or was barely solvent). Otherwise, the (normative) mischief associated with time-subordination could still occur if, against forecasts, the plan did not come to fruition. (The mischief, to repeat, is that if the central bank lent but the plan unravelled or turned out never to have been well-grounded, short-term creditors would get repaid but (equally ranked) longer-term creditors would end up worse off than if the firm had gone into a bankruptcy proceeding immediately.)

This leads to another important practical question: what happens if a central bank lends when it believes either that a liquidity-stricken bank is or will become solvent but later, while the loan is outstanding, it concludes that the bank is now insolvent and/or that any remedial plan cannot work (with sufficient likelihood)? The answer is that, once it reaches that view, it should call the loan, and trigger the bank’s entry into resolution (or a bankruptcy procedure).

It has to be underlined that the availability of this option (where realistic) is transformational for central banking. That is because it releases top central bankers from the awful dilemma of choosing between, on the one hand,

lending when they should not and, on the other hand, presenting elected politicians with a choice of chaos or taxpayer bailout. For that reason alone, it is very much in the interests of top central bankers, as lenders of last resort, actively to monitor and scrutinise the adequacy and credibility of resolution regimes in general and resolution plans for specific firms in particular. As a general matter, however, judging from speeches and interviews there is little evidence that all central banks have in fact internalised this. (As a passing remark: whether or not true, the SNB probably knows that it has had a reputation for being sceptical about resolution.)

To be clear, this is not to suggest that central banks should always be applauding resolution plans, as some might be objectively inadequate. It means that whenever central bankers do have doubts, they cannot be passive. Instead, they have a strong interest in pressing the regulators and government for a remedy in the form of tougher regulation (smaller, safer, less systemic banks) or reformed resolution strategies and management. Otherwise, they are leaving a trap either for themselves as LOLR or for the finance ministry as the source of taxpayer bailouts.

Assessing solvency

The transformation brought about by the advent of resolution regimes bears on another important issue: whether making judgments about solvency is feasible. A number of canards circulate on this.

One, found in parts of the scholarly literature and occasionally even in policy maker speeches, is that the key test is the availability of good collateral.³⁹ That is mistaken. Precisely because banks are highly levered, they could be rendered insolvent by a relatively small proportion of their assets proving to be worthless. Even if the rest of their portfolio was high-quality and therefore acceptable to the central bank as collateral, that will not be enough to repay the firm's liabilities.

³⁹ See Tucker 2014 and 2020 for citations.

An arithmetic example makes that clear.⁴⁰ Imagine a bank with one unit of equity; a balance sheet of 100 units, i.e., 100 of assets and 99 units of debt liabilities; 10 units of risky assets and 90 of safe assets. Now imagine that all the risky assets prove worthless; and that the LOLR lends 30 against 30 units of safe assets, allowing 30 units of private debt liabilities to be repaid. In consequence, there are 60 units of assets left to cover 69 units of unsecured liabilities (a payout of about 87%) rather than, had the bank gone into liquidation, 90 to cover liabilities of 99 (payout of 90%).

The example usefully illustrates another point. That a central bank being repaid in full, although obviously useful, is not a sufficient test of the legitimacy of the LOLR operation. The central bank might be repaid in full while discriminating between equally ranked creditors. The availability of good collateral is very important, as discussed below, but it is not a fool proof indicator of a borrowing bank's basic solvency.

But can solvency be reliably assessed at all? Some commentators seem at times to say or imply that it is almost always impossible to make judgments in real time about whether a distressed firm has fundamental problems of solvency or viability.⁴¹ That is not so. Sometimes it is easy, sometimes it is formidably hard, and sometimes it is in between. The LOLR might, therefore, need reviews of asset quality, and a host of other things that might fall to the supervisor or others.⁴²

In some cases, it is almost impossibly hard to judge solvency but the right course of action is nevertheless clear. Take the example of a firm in internal disarray; maybe its books and records are in such a mess that even the identity

⁴⁰ This passage draws on Tucker (2014). Of course, when a bank is alive, new secured creditors can get in front of otherwise equally ranked long-term creditors, but the latter know that, and (for the corporate sector in general) the documentation of some unsecured bond issues includes constraints on how far it can happen.

⁴¹ See, for example, Freixas, Xavier and Anthony M. Santomero, "An Overall Perspective on Banking Regulation." Federal Reserve Bank of Philadelphia Working Paper No. 02-1, February 2002; and C. A. E. Goodhart, "Myths about the Lender of Last Resort" in *The Lender of Last Resort*, Edited by Forrest H. Cappie and Geoffrey E. Wood, Oxford and New York: Routledge, 2007.

⁴² An asset quality review, it is interesting to note, is exactly what the Bank of England commissioned for Overend & Gurney in the great 1866 crisis. See pages 18-20 of Tucker (2020) "Solvency as a Fundamental Constraint."

of its assets is highly uncertain, never mind their value. In those circumstances, providing LOLR to an open bank would be a gamble rather than a serious policy. Such a firm needs to go into resolution or bankruptcy rather than to be given a lifeline.

In other cases, the assessment needs to be probabilistic, conditioned on reasonable assumptions about the effect of a liquidity operation on banking distress and, hence, its likely implications for the path of the economy and default rates. One way of thinking about “fundamental problems of insolvency” is that there is no plausible path for the economy, even after liquidity and macroeconomic policy interventions, that will restore a distressed bank(s) to solvency.

Public facilities versus ELA redux

A lot has been said here about public facilities and ELA. Recapping a central point, on my account the boundary, within the family of LOLR operations, between public facilities and ELA is of profound importance. Broadly stated, where a potential borrower meets the published criteria for borrowing from a public facility (solvency, eligible collateral that can be delivered to the correct place at the correct time, and so on), they get access. By contrast, ELA is in its nature a more discretionary affair. The central bank will want to ask the firm some questions. For example,

- Why the need has arisen, and what it plans to do to recover the situation;
- Details on any assets offered as collateral, including on valuations and on whether they are already encumbered;
- A day-by-day breakdown of all maturing or on-demand obligations and claims;
- Any ratings-based or other triggers for accelerating or closing out contractual obligations and claims.

This is easier when the supervisor responds pre-emptively to incipient problems (the prompt corrective action described in Part 1) or the LOLR has planned ahead. Since a clumsy PCA intervention by the supervisor risks triggering the very collapse that it seeks to avoid, some central banks — perhaps notably the Bank of England — seem to have moved in recent years to putting a premium on LOLR planning (Annex A and below).

In any case, collecting the information to answer those questions will in many cases involve the supervisor, possibly the resolution agency (and deposit insurer), and the finance ministry. Collectively, they might have to decide what to do to get the firm/group to safety, or whether to let it go.

An interesting case arises where, on the face of it, a firm satisfies the criteria for borrowing from the public facilities but the central bank alone or the authorities collectively want to use ELA precisely so as to activate their powers of intervention and control. Obviously, those judgments need to be defensible, to the public and at law.

Collateral policy and practices

While the availability of good collateral does not prove a bank's solvency (see above), it is absolutely vital for a central bank LOLR. That is, essentially, for two reasons. First, to help combat moral hazard and second, to protect the central bank (and hence the tax paying public) against default risk. It cannot be emphasised enough that collateral policy needs to work backwards from default, when the central bank lender is left holding outright the assets put up as collateral (assuming a repo structure); or as a secured creditor if the assets were pledged via a fixed or floating charge. If a central bank cannot manage the assets after the default, something has gone seriously awry.

Eligible collateral

In routine monetary policy operations, collateral is hardly the point. Their purpose is to meet the banking system's aggregate demand for reserves, leaving the money markets to distribute reserves to whichever particular banks demand them. Thus, if a sound bank wanting to hold more reserves does not have enough high-quality collateral on a particular day to borrow directly via the central bank's OMOs, that does not matter because it can pick them up in the unsecured money markets (or in markets for borrowing against risky collateral). That relies on each bank's name being accepted in the market.

A remarkable, but not terribly surprising, thing revealed by the GFC is that a firm whose creditworthiness has become doubtful is sometimes unable to borrow secured even against US treasury bonds. In 2007/08 this was not the proverbial "run on repo" since, after all, the central banks were continuing with repo operations (without worry).⁴³ Rather, it was a race to get away from specific counterparties as, if they defaulted, it might be awkward to explain any delay in taking hold of and liquidating the underlying paper. So, a central bank LOLR might sometimes need to exchange government bonds for reserves, since no one will refuse them (assuming a semblance of price stability, no geopolitical sanctions etc).

More frequently, the purpose of LOLR operations is to convert risky collateral into reserves (or treasury bills). It could hardly matter more, therefore, what instruments a central bank will take as collateral, and on what terms.

Some obvious truths include the following. The narrower the classes of collateral eligible in a central bank's published-regime operations, the more any LOLR will be executed via ELA. If, further, the collateral eligible for ELA is narrow, the less a jurisdiction will have scope for LOLR operations, putting the burden on prophylactic supervision to prevent crises from occurring at all.

⁴³ It is true that there was a run away from repo markets in a wide range of risky instruments, almost irrespective of counterparty soundness, as illuminatingly analysed in Gorton, Gary, and Andrew Metrick (2012), "Securitized Banking and the Run on Repo," *Journal of Financial Economics*. But central banks continued to conduct repo operations against many (but not all) of those asset classes too, notably prime-mortgage bonds.

Where a decision to use only a narrow class of collateral (in both the published regime and ELA) is taken by the legislature (or by the elected executive branch under delegated powers), majoritarian institutions, accountable via the ballot box, are choosing their country should rely mainly on supervision and taxpayer bailouts. Where, by contrast, the narrow classes of collateral are the result of discretionary choices by the central bank itself, unelected central bankers are choosing that their country should rely more on bailouts when liquidity crises occur or, alternatively, signalling that other authorities should restrict the scope of banking in and from their jurisdiction (although, of course, that does not happen). Those important propositions are independent from the normative view one takes of them (see Part 3). In fact, as surveyed in Annex A, although the details of policy vary considerably across the main jurisdictions, each of the Fed, ECB and Bank of England have at different speeds moved to taking a wide range of collateral in the discount-window facilities, and the latter two in their regular or contingent long-term repos. (At least up to the CS affair, Switzerland has been different.)

Whereas regular Discount Window-type facilities almost by definition incorporate published lists of eligible collateral and haircuts (excess collateral requirements), practice on ELA varies. Some countries have considerable discretion to determine the collateral they will take against ELA, but some others specify it *ex ante*. Amongst the latter, the specification functions as a constraining commitment device if the list and excess-collateral requirement (haircuts) are set out via a legal instrument of some sort. This increases the visibility, and so prospectively the cost, of amending the list so as to relax collateral requirements in the face of adversity. One purpose is to mitigate moral hazard risks at the central bank/executive branch *vis a vis* the legislature, and so to discipline the liquidity management of the banks themselves.

Whether pre-published or entirely discretionary, the class of eligible collateral is not static. The terms of central banks' secured-lending facilities and transactions typically give central banks the right and opportunity to call for more collateral, and indeed to decide that they will no longer accept specific types of collateral, requiring new types of collateral to be substituted for what

have become ineligible instruments. That brings us to risk management, which it turns out is important for LOLR policy.

The significance of central bank risk management: haircuts, and valuations

We have seen that central banks can lend secured via open market operations, continuously available facilities, pre-published contingency operations, and discretionary ELA. Whatever the purpose and form, a (sane) central bank almost invariably takes excess collateral, and regularly revalues the collateral to ensure it is still satisfactorily covered, calling for extra collateral when it is not.

Excess collateral requirements are common because if and when a counterparty defaults, the value of the collateral held by the central bank might fall below the value of its claim before the assets can be sold or realised. Hence the amount of excess collateral demanded depends not only on the lending central bank's risk appetite, but also on judgments about the possible holding period and price volatility after a borrower defaults. The amount of excess collateral required will, therefore, vary with the nature of the instruments provided as collateral and, also, the systemic significance of the borrower.

The first point is straightforward. It will take much longer to realise or dispose of a portfolio of loans to households and small businesses than, say, a bundle of high-quality government bonds. The longer the exposure lasts, the more likely, other things being equal, that the value of the assets will fall short of what is required.

The second point might be less intuitive but is important. The failure of a systemically important financial institution (SIFI) is liable to trigger market-wide volatility — even if a resolution plan works really well — so there is a heightened probability that the value of collateral will fall just when it matters. For that reason, there will be a question of whether excess collateral

requirements on loans to SIFIs should be higher than for lending to those small and simple banks whose idiosyncratic failure would be unlikely to spillover to the economy and capital markets as a whole.

When extending a loan, and while the loan is outstanding, the central bank will want frequently to check the value of the collateral. In normal circumstances, that will typically be each day, but in so-called “fast” markets more frequently. Valuation is straightforward for assets traded in liquid markets and, at the other end of the spectrum, harder for assets, such as commercial loans, that are not traded.

Where valuations are not easy because the underlying instruments are illiquid and opaque, there is scope for central banks to shade valuations one way or another. Overvaluing assets offered as collateral is one way of delivering soft terms in obscure ways. For that reason, during the GFC, but after prompting from some leading economic commentators, the Bank of England published a paper on how it valued the assets eligible in various facilities.⁴⁴

Pre-positioning of collateral, and LOLR planning

Some of those important operational activities are helped if firms pre-position collateral with the central bank, which (roughly) means the central bank holds the instruments as a sub-custodian for any particular bank.⁴⁵ To be clear, however, pre-positioning does not guarantee the central bank will lend, for all the reasons discussed above (assessing solvency and viability, if relevant the credibility of recovery plans, the effectiveness of a resolution in restoring

⁴⁴ This is most relevant for outright purchases, or loans where the central bank does not have a right to seek more or new collateral (I do not recall operations of the latter kind in the UK). See Breeden, Sarah J. and R. Whisker. “Collateral risk management at the Bank of England.” *Bank of England Quarterly Bulletin* (2010) Q2.

⁴⁵ Disclosure: I initiated a policy of encouraging some collateral to be pre-positioned with the Bank of England in 2008 when a Discount Window Facility was introduced as part of the public framework for the Bank’s monetary operations. As far as I know, the practice was initiated some years earlier by the New York Fed, but more recently the US seems to have lacked energy on this front, as evidenced by elements of SVB’s demise (Annex A).

solvency, and so on). It is, though, very useful, and is likely to speed up the provision of LOLR support against illiquid or otherwise risky collateral.

Even where there is no regime for pre-positioning, it can usefully be adopted ad hoc in certain circumstances. Requiring collateral to be pre-positioned by a firm only once strains are becoming apparent, in preparation for *ad hoc* ELA, will sometimes be liable to ignite panic if leaked, and so (like late resolution preparations) requires careful judgments. That is obviously not a material consideration, however, once there has been a run of some degree (as at Credit Suisse during the autumn of 2022). In that case, it can be a sensible precaution to require pre-positioning by the specific bank/banking group in case things get worse.

Regimes for pre-positioning can take a number of forms. One merely ties pre-positioning to eligibility: if a particular firm wants assets of eligible-type x to be usable as collateral, it needs to pre-position them at least x days before any drawing against them would be possible. That type of approach can be driven entirely by operational considerations. As a basic precaution for central banks willing to lend against wide classes of collateral, it gives their staff (and interested policymakers) valuable practical opportunities to learn the details that will matter if ever they end up holding the assets outright. To give one, slightly stylized example, during the GFC the Bank of England collateral team spotted, in their pre-lending checks, that the portfolio of an ABS supposedly confined to UK mortgage loans actually contained a few loans to car-park operators in a different country.

The example helps underline that pre-positioning is a process as well as a destination. If a bank submits for pre-positioning lots of paper that is rejected by the central bank, the authorities have discovered something important: that it will be difficult for the LOLR to cover a full-blooded run unless there are changes in the bank's asset base, and perhaps even in its business model. It is much better to discover that when things are calm than in the midst of a crisis. This might be a serious consideration for some kinds of business model. Would central banks lend against a portfolio comprising nothing other than highly levered loans to private-banking clients, for example?

That points to a shift of perspective that helps reveal pre-positioning's wider potential utility. At a basic level, it reveals more effectively than either periodic supervisory inspections or board assurances whether a bank has actually got the collateral it says it has got, and where it is held (legal entity, jurisdiction, custodian, etc). Second, if assets are pre-positioned with the central bank, they cannot be deployed as collateral in private transactions — to market counterparties, clearing houses, and so on — without the central bank knowing. The central bank is, therefore, in a position to track whether some of a bank's assets are encumbered, meaning they are not free to be used in either the central bank's regular or crisis-management operations. Third, if the central bank switches on its analytical capacities, examining the collateral pre-positioned with it can help supervisors identify potential vulnerabilities. For example (think SVB, the US bank that collapsed in spring 2023), "bank x seems to be carrying a large long-term fixed-interest bond portfolio, so maybe worth checking its exposure to interest-rate risk." Even if not that alert, unless its analytical capacities were dormant, tremors of stress would be detected as soon as rising yields prompted daily calls for extra collateral.

For any or all of those reasons, central banks could adopt another type of regime. This would *require* pre-positioning of eligible assets sufficient, after haircuts and on the central bank's valuations, to cover x% of a bank's short-term (runnable) liabilities. The choice of x would be a major parameter of the jurisdiction's regime for banking stability (Part 3, and Annex B).

That, though, begs an important set of questions that until now have been obscured. Namely, which entities within a group are eligible to borrow from a central bank, which entities hold collateral that is either eligible *ex ante* or which the central bank is prepared to take as a matter of discretion, and which entities in the group have maturity mismatches that leave them vulnerable to a run. In principle, the three might not coincide, posing vital and awkward questions that are part of planning how to use a LOLR regime.

The complications of group structure and geography

Up to this point, the report has abstracted from the structure of banking groups, implicitly assuming either that each group comprises a single legal entity (an operating bank) or, at least, that no other legal entity matters in a banking group other than the main domestic bank. This, of course, is not remotely true, which can matter enormously to the effectiveness of LOLR regimes.

Imagine a complex group with a holding company, and a range of operating subsidiaries. They are all domiciled in the same jurisdiction and transacting entirely in the domestic currency, so two dimensions of real-world complexity are still bracketed away. Among the subsidiaries, imagine there is a licenced bank, a securities dealer that is licenced as such not as a bank, ditto for a wealth-management subsidiary, and so on. The holding company is not licenced as a bank, or indeed at all because although it controls entities conducting regulated activities, it does not itself conduct any regulated activities. The name of every legal entity in the group begins with the group's brand name; e.g., although its group structure was not exactly the same as in my imagined example, Credit Suisse Holdings, Credit Suisse X, Credit Suisse Y, and so on.

Of this imaginary group's operating entities, although only one is licenced as a bank, several of them have the balance-sheet fragilities of a bank, in particular maturity mismatches (see Part 1). The operating bank itself is highly liquid, not least because of the reserves injected into the banking system by quantitative easing. Also, apart from reserves at the central bank, a material proportion of its other assets are eligible as collateral at the central bank. That is not true, however, of the other legal entities, which are neither eligible in the central bank's regular operations nor carry assets eligible as collateral for LOLR support.

A run develops in one of the non-bank entities. Through name-contagion, it spreads to other non-bank entities, but let us imagine not (yet) the operating

bank. All of the distressed entities need liquidity help for them to have any chance of sustaining their viability. Where can that liquidity come from?

There are two options: the sister bank, and the central bank. In principle, it need not matter that the liquidity problem and the good collateral are in different places. In principle, the central bank could lend to the non-bank against a collateralised guarantee from the group's bank, or it could lend to the bank which on-lends to the related entities under stress.⁴⁶

At this point, however, the granular nuances of the local legal regime for the monetary authority and for corporations, and perhaps for banking corporations in particular, can matter. For example, the central bank cannot directly help the afflicted subsidiaries if it is permitted, by law, to lend only to banks; not to other types of regulated entity, and not to unregulated entities, including holding companies. But it might not even be able to help indirectly (by lending to the operating bank, for on-lending to the distressed sibling subsidiaries) if, as in the US, there are limits on banks lending to affiliated securities dealers.⁴⁷ And there might be no way through those obstacles if, under general corporate law or regulatory law, the board of the operating bank owes no duties to the group holding company, and cannot be instructed by the holding company to weaken its own balance sheet in the interests of helping its afflicted kin.

Whether or not that imagined situation is pertinent to Credit Suisse's predicament, it is relevant to the design of policy regimes. That is because it would be absurd for a country to find itself in circumstances where its crisis-management options were severely narrowed because liquid (runnable) liabilities were in one legal entity, usable collateral in another, and legal constraints prevented or badly delayed the LOLR completing the triangle.

⁴⁶ That route would probably need underpinning with some kind of central bank contract with the afflicted entity if only to ensure access to information and so on, but that important operational detail is not directly relevant to the point raised in the main text.

⁴⁷ The US's legal limitations on banks lending to related securities dealers can be waived by the relevant agencies certain to some statutory constraints.

Where that situation could arise, there are several potential remedies. One is not to permit the existence of shadow banks within banking groups. Another is to allow the central bank to lend to such non-banks, either on its own discretion or after formal approval from the executive government (the position in the UK and, with more hoops, in the US). But the key point here, and for the Swiss authorities, is to recognise where the predicament does or could arise.

Coordination with supervisors, resolvers, deposit insurers, and the finance ministry

At various points of Parts 1 and 2, it has become clear that the LOLR affects other authorities' missions while also being dependent upon them. Before turning to my normative views and prescriptions, this final part of Part 2's account brings those interconnections and interdependencies together.

Starting with how the central bank LOLR's policies affect others, we can list the following. Most important, if a central bank will only ever lend against a narrow class of collateral — whether to going-concern banks, or to banks in resolution or conservatorship — the state faces a choice between, on the one hand, tighter regulatory requirements in order to reduce the probability of failure and, on the other hand, a higher incidence of taxpayer (equity) bailouts. This gives the other authorities an interest in the determination of the population of eligible collateral.

Interestingly, something similar follows if a central bank is vague or non-committal about its LOLR policies, with its published facilities narrow (or non-existent) and ambiguity around its use of ELA. Notwithstanding the long period during which central banks seemed to embrace the doctrine of constructive ambiguity (see below), this was perversely an invitation for other authorities to try to circumscribe central bank independence.

In the other direction, a central bank lender needs to form views on the solvency of a distressed firm. That means it needs information from the supervisors. If the information does not flow, the central bank has incentives to be cautious in deciding whether (and on what terms) to extend liquidity assistance. That is not in the interests of the finance ministry (and, if separate, the economics ministry) due to the costs of bailout and the social costs of banking failures.

In the same vein, if the prophylactic regulatory regime is relaxed or discretionary supervision is haphazard or worse, the central bank has incentives to accept only a narrow class of collateral in its lending operations (published or discretionary ELA) as the banking system as a whole, and individual banks within it, are more likely to get into difficulty, leaving a higher probability that borrowers default. Arguably, those incentives are more powerful still if there is no resolution regime, or if it is not fit for purpose, or if resolution planning for individual firms is inadequate even though the legal regime is fine on paper.

We have, then, a field where the mutual dependencies among the various financial-system authorities are manifold. If supervisors take no interest in the central bank LOLR regime, the losers will be the public. But the same goes if the central bank, wrapping itself in the imaginary cloak of a monetary Olympus, takes little day-to-day interest in banking regulation, supervision and resolution, or in banks themselves. So-called financial stability committees, bringing different authorities to a supposedly cooperative table, do not cure these problems if the law leaves their members with incentives to opt for a quiet (or isolated) life. That, a recipe for underlap and under preparation, is a stable but malign institutional equilibrium.

Those inter-dependencies are important but prosaic. Change the organizational architecture, and you change where the cooperative pressure points bite. There is, though, a deeper connection between LOLR and the rest of the regime for banking; one that stands irrespective of the architecture.

It is this. Although LOLR assistance, and in particular the expectation of such help, invariably creates moral hazard, the solution to fundamental problems in a distressed banking group does not have to come entirely from the LOLR regime itself. That might have been so in Bagehot's day, but no longer. The solution (or at least some mitigants) can come from the regulatory, supervisory, resolution and bankruptcy regimes. Thus, what the central bank sows as LOLR can be cured in degree by other functions. Where those other functions lie in other agencies, there is a need for coordination and cooperation. As in any such situation, this faces serious collective-action problems. For example, generalising an earlier point, where the monetary authority regards the regulatory regime as slack, it might have incentives to toughen up its LOLR regime. Ex ante that might be locally optimal, but ex post crises are more likely to land on the desks of the finance minister and prime minister, begging for taxpayer bailouts.

A brief summary of other jurisdictions' LOLR regimes

Part 2 wraps with a summary, in very broad-brush strokes, of the three foreign LOLR regimes described in a little more detail in Annex A.

The Federal Reserve operates LOLR via a published system but frequently innovates in the face of pressure, using ELA especially for non-banks. It encourages prepositioning, and takes foreign ABS but, without formally precluding it, does not routinely take portfolios of raw loans governed under the laws of non-US jurisdictions.

The ECB lends against a wide range of collateral via OMS and an overnight standing facility, and so conducts some LOLR operations directly, but ELA is the responsibility of National Central Banks, who do not publicise their regimes. It is not known whether the NCBs require prepositioning. They are thought to restrict collateral to instruments governed by EEA law. It seems to me that NCBs, and therefore the EA, could in principle face the kind of issues that afflicted the SNB in the CS case.

The Bank of England shares much with the Fed and the ECB, but is distinct in some important respects, perhaps because, like Switzerland, its economy and so the population of domestic-law credit instruments is much smaller than the US and EA economies. The Bank of England has a published LOLR regime, operating largely through a Discount Window and OMOs, with published contingency plans. It places great weight on pre-positioning, including in principle pre-positioning of securitised portfolios of loans governed by foreign law (subject to various conditions).

None of those jurisdictions' regimes or broader circumstances is exactly analogous to Switzerland's but they are instructive nonetheless, both in general (Part 3) and in particular (Part 4). That is because the Swiss system is, as matter of form, like the UK's in being largely the product of central bank policy but, as a matter of substance, like the Euro Area's NCBs in that the SNB has chosen to have LOLR operate almost entirely via discretionary ELA, with a narrow class of eligible collateral and, until recently, little preparation across the banking system as a whole.

PART 3: PRESCRIPTIONS FOR LOLR REGIMES OPERATED BY INDEPENDENT CENTRAL BANKS

As a general matter, I believe that in a constitutional democracy, such as Switzerland, a regime for delegating powers to an independent agency (such as the SNB) needs to satisfy four design principles: high-level purposes, goals and powers need to be framed in primary legislation, even if fleshed out by the executive branch of government under statutory authority; the agency needs to operate within that domain according to reasonably clear principles, which it publishes; transparency needs to be sufficient, if only with a lag, for both the regime and the agency's stewardship of it to be monitored and debated by the public and, crucially, the legislature; and there needs to be clarity about what

happens, substantively and procedurally, during a crisis and, in particular, when the agency reaches the boundary of its authority.⁴⁸

How those general design principles are applied to LOLR functions turns on the substance discussed in Parts 1 and 2. On that, a fit-for-purpose LOLR regime needs to find decent answers to four issues: time consistency, moral hazard, adverse selection, and the zone in which independent central banks can take fiscal risks. A comment on each is warranted.

Acting as the lender of last resort involves making commitments: to lend in order to stave off or contain systemic distress. Those commitments need to be credible, which requires amongst other things that they be time consistent. The regime will not work well if people believe a central bank will change its mind or has no clear principles. It is no good saying you will lend only against high-quality collateral if you end up relenting and lending against wider collateral. Ditto signalling you will lend only to banks designated as systemic if other banks prove systemic in particular circumstances.

As with any kind of insurance, liquidity insurance creates incentives for banks and others to take more of the insured risk, in this case liquidity risk. Moral hazard (in firms' behaviour) is a major issue that must be addressed if a regime is to serve society well over time. Unless care is taken, that can conflict with time consistency. If a central bank pledges not to provide assistance in some form or other (e.g., to insolvent firms) but then buckles in the face of systemic distress, future promises to the same end will probably not be believed, exacerbating moral hazard, exacerbating stigma, and putting the financial system on an unstable course. So, ways have to be found to underpin the credibility of official sector commitments designed to contain moral hazard in the industry.

Many types of insurance are plagued by a problem of adverse selection, with only the riskiest being prepared to take up the offer of insurance. That leaves the insurer exposed to bad risks. In the case of LOLR, which serves a public policy purpose, the challenge is how to design a regime that all firms are

⁴⁸ See Tucker, *Unelected Power*.

prepared to use before it is too late to contain a liquidity crisis and its wider costs to society (the “stigma problem” discussed in Part 2).

Finally, there is no getting away from the fact that LOLR assistance is risky. However well protected, the central bank can in principle suffer losses. This is not a theoretical point: losses have crystallised in practice. In the first instance, the central bank will cover its losses by drawing on its capital or by paying less seigniorage over to the government. Either way, that simply transfers the costs to government. Ultimately, losses are a fiscal issue. They must be covered by higher taxation (or lower public spending) or by higher seigniorage, i.e., resorting to inflation as a tax. The LOLR regime therefore needs to be framed to draw a line around unacceptable fiscal risk. Among other things, that separates non-ELA LOLR from the ELA component of a LOLR regime.

A summary of a LOLR regime for advanced-economy liberal democracies

Against that background, the LOLR regime I recommend *in general* has the following features:

- Wherever possible, provide liquidity assistance to the market as a whole, via Open Market Operations (OMOs).
- Have a Discount Window facility (DWF) for bilateral assistance that is separate from an overnight facility that is part of the apparatus for stabilising the overnight money-market rate in line with the central bank’s policy rate.
- Take a wide class of collateral in the DWF and in some long-maturity OMOs. Make that class as wide as is consistent with the leaders of the central bank being able to understand and manage it, including after a counterparty has defaulted.
- Give all banks operating in the jurisdiction access to those facilities, subject to various preconditions.
- Ensure there are no technical obstacles to providing LOLR assistance by lending Treasury Bills rather than cash.

- Provide LOLR beyond those standard facilities, termed ELA, only if the operation is likely to work to contain the risk of systemic distress or social problems that the authorities wish to avoid. Success could come by dispelling panic, or by facilitating an orderly wind down of a firm/group, or otherwise bridging to a fundamental solution for the firm.
- Whether LOLR is provided via facilities that are part of a public regime or via ELA, there should be a precondition that borrowers are not afflicted by fundamental solvency problems.
- For essentially the same reason, an independent central bank should not set soft terms when helping a firm(s), with any fiscal subsidy provided by the elected fiscal authority.
- Access to the public facilities, or depending on the circumstances to ELA, should continue immediately after a successful resolution.
- Publish a framework setting out all that, plus how soundness/solvency will be assessed (which should not be left entirely to the prudential authority).
- Recovery planning must include demanding liquidity tests, including every significant element of implementing LOLR policy in stressed conditions.
- Each bank (meaning each banking entity) should be required to pre-position with the central bank sufficient eligible collateral to cover a high proportion of its short-term liabilities. I would make that proportion 100%. The requirement should bite on a daily basis, but with real-time monitoring of some kind.
- Recovery plans and resolution plans should each be subject to formal approval/sign off not only from prudential and resolution authorities but also from the central bank LOLR. For SIFI groups (including individual banking entities and any other entities running material liquidity mismatches), the sign off should come from the highest level of the central bank.
- The central bank should conduct regular exercises testing the realisation of all the types of eligible collateral. If, despite my recommendations, the population of eligible collateral is narrow, it should conduct such exercises for the kinds of collateral it will find itself accepting in ELA

(with prudential supervisors formally involved in identifying such asset types).

- Top central bankers should give regular speeches on LOLR policy, including how it fits with recovery, resolution, and conservatorship.

The rest of Part 3 puts flesh on those bones but in a different order: the importance of a published regime; substance; and governance, including relations with the other domestic authorities.

A public LOLR regime

For many decades, the core principle underlying central bankers' approach to LOLR was what came to be known as "constructive ambiguity."⁴⁹ This has its roots in the moral hazard dilemma at the heart of any expectation that the central bank will definitely provide support, which was described by Bagehot's contemporary, former Bank of England Governor Hankey as a threat to "any sound theory of banking."⁵⁰ Hankey had a point, related to the solvency constraint but, overall, constructive ambiguity proved a failure. It most definitely did not induce more prudent liquidity management, and central banks could barely cope when there was a sudden need for help because, on the whole, they had rarely prepared properly.

The doctrine might even have been perverse, including in Switzerland. It is possible that it leaves market participants with the impression that conditional on the central bank lending at all, it will lend against more or less whatever

⁴⁹ See, Corrigan, E. G., Statement before the United States Senate Committee on Banking, Housing and Urban Affairs', Washington, DC, 3 May 1990. During my time, not a few governors remained attached to the doctrine. Thus, when I led a post-2008 crisis Basel working group on whether central banks should be ready to lend to central counterparty clearing houses, the governors would go no further than a commitment to ensure that there were "no technical obstacles" in the way of their doing so. Many of the governors were adamant that there could be no commitment. (Since I have become very critical of the doctrine, I want to record that Corrigan was one of the very finest central bankers of recent generations, and I was lucky and proud to count him as a friend.)

⁵⁰ Quoted in Kynaston, David, *The City of London: A History*. London: Chatto & Windus, 2011, p.85.

collateral a firm can put up. Where that is not true — say, because the central bank is unwilling or simply not equipped to lend against many of a firm's assets — ambiguity (which here amounts to opacity) might be positively harmful since wholesale creditors will have believed there is a bigger potential backstop than, in fact, exists. The effects of that perception on creditor behaviour would be offset only if market participants also think it unlikely that the central bank would help with liquidity. That is not, and will not be, the perception when it comes to systemic groups (and many others). Taken together, these points make a case that the constructive-ambiguity doctrine was, in fact, moral-hazard inducing counterproductive ambiguity. Bluntly, if a central bank will lend only against asset class A but the market thinks it will lend against a whole alphabet of asset classes, the banking system rests on flaky foundations.

Be that as it may, the best evidence of the ambiguity doctrine's costs is provided by the continuously improvised LOLR operations from 2007 (and before) until earlier this year for *types* of situation that in many cases, if not all, could reasonably have been foreseen by policymakers and their staff. The major cost, then, has been inadequate operational planning. Things have, mostly, been improving since the GFC but the liquidity collapses this year in the US and Switzerland show that much remains to be done: more in some centres (in my view, including Bern-Zürich) than others. In a nutshell, LOLR needs to be professionalised, as monetary policy was during the 1990s.

I am, then, in favour of well-articulated public regimes for LOLR, with central banks making as clear as possible what they will do, and the terms and preconditions on which they will do it. Like transparency in monetary policy regimes, this will be good for efficiency, accountability, and, crucially, the internal discipline and effort of central banks.

Some want to take public facilities further, by charging for the (conditional) commitment to lend on the published terms.⁵¹ This is a bad idea. If banks paid a fee, they would complain that they had been let down or cheated if and

⁵¹ Jeremy C. Stein, "Liquidity Regulation and Central Banking," Federal Reserve Board, April 19, 2013; and, for the industry, William Nelson, "Recognizing the value of the central bank as a liquidity backstop." The Clearing House, January 2017 (revised June 2018).

when an application to draw on the facility was declined (say because of solvency problems). "But I paid for this" is a short sentence that would prove useful with sympathetic senators (and their staff) and on television. If you pay for something, you expect to receive it, yes? As it happens, there are ways of inducing confidence in the availability of LOLR assistance without making that mistake (see below on pre-positioning).

Substance

This section is about the substance of our recommended benchmark regime.

A wide-collateral Discount Window as the core of the regime

The centre piece should be a Discount Window at which eligible counterparties can borrow against the widest possible population of collateral (below). It is fixing the terms of this — eligible collateral, haircuts, term, premium rate of interest, and a lot more — that makes the central bank prepare, and adds grit to the authorities' urging for the banks themselves to prepare.

OMOs against wide collateral as an adaptable, less stigmatised source of insurance

Depending partly on the rules for publishing use of the Window, it might be affected by stigma. Medium-term OMOs against a set of fairly wide collateral can help fill the gap, since they can be held regularly, and so when there is no stress in the system. This gives the central bank regular experience in valuing, taking delivery of, and re-margining types of collateral that it would not gain familiarity with if focussing solely on the (net) supply of reserves.

Further, OMOs can be adapted in terms of size, maturity and so on, which could be useful when stress is building, or just on the horizon.

Lend Cash or Bills?

Cooperating with the finance ministry, the central bank should be capable of lending Treasury Bills rather than only cash (reserves). That means banks need to be capable of borrowing Treasury Bills (via a collateral swap).

This capability is important for three reasons. It may be useful where, if it lent cash on a gigantic scale, the central bank would struggle *immediately* to sterilise the injection of base money into the economy (taking account of any increase in the system's net demand for reserves). Second, it gives the borrowing bank an opportunity to borrow cash in the market against bills, which might be useful if, for example, its difficulties are not widely known. Second, it might help buy the authorities time for how they explain the intervention, given that a massive, unexpected injection of reserves is likely to be spotted immediately. Practical examples include the Bank of England providing LOLR via collateral swaps to two large UK banking groups during autumn 2008.

For this to be feasible, the following are necessary. The central bank needs to have an agreement with the finance ministry (and/or its debt-management agency) for borrowing newly created treasury bills (which are not issued to the market to raise cash). Second, the central bank and all relevant banks must be technically capable of conducting collateral swaps, which among many other things requires a legal agreement, and systems and controls, including in financial accounting. It can be improvised quickly only if the central bank and a relevant bank know what they are doing, and so is best incorporated into LOLR planning during financial peacetime.

Eligible counterparties: types

All banks authorised by a jurisdiction should be eligible for both the Window and the medium-term, wide-collateral OMOs. Combined with regular live test use, this can help to reduce adverse selection. It also avoids the problem of saying that only banks designated as systemic are eligible only to find that, in particular circumstances, others are systemically relevant but neither they nor the central bank has prepared for their ever taking LOLR help.

In the same vein, if a bank could be brought down by another local member of the same group of companies, then either there need to be severe regulatory constraints on that entity, or the bank needs to be able to on-lend assistance (which ring-fenced banks cannot), or that entity itself needs access to the Window or to ELA.

A further important question, only touched on here, is whether so-called shadow banks, operating with balance sheets that have bank-like fragilities, should have access to the Window. During the early phases of the GFC, major central banks found themselves caught out on this, improvising as the nature of the liquidity crisis became more apparent. For example, as the US broker-dealer group Bear Stearns was failing in spring 2008, the Federal Reserve launched a Primary Dealer Credit Facility under the emergency-operations procedure (Annex A). For any jurisdiction with a large shadow banking sector, something like this is inevitable eventually.⁵²

Eligible counterparties: the solvency constraint

As already argued in Part 2, independent central banks should not lend to firms they know — or reasonably should know — to be fundamentally insolvent; i.e., are insolvent at the point LOLR is requested, and have no realistic prospect

⁵² It requires a different regulatory package for the relevant firms, funds and vehicles from now. If a shadow bank does not have access to the Window but finds itself needing and being granted LOLR assistance in order to forestall or contain systemic distress, I believe the law should enable the principals to be banned from the financial services industry. I do not pursue this further here as it was not in my terms of reference. I raise the issue because if the LOLR regime for banks is perceived by bankers as tough (remember they do not have incentives to internalise social costs), there are incentives to move banking-like activities into shadow banks.

of recovery solvency during the life of a loan. This goes for any type of central bank lending. Governments guaranteeing their central bank does not cure the problem, which concerns *unelected* officials discriminating against longer-term creditors (see Part 2).

Because forward-looking assessments of solvency (and so recovery) are probabilistic, the central bank needs to decide what its probability threshold for solvency assessments should be. They should probably consult the finance ministry, since what the central bank cannot do, the fiscal authority might end up doing. (See also below on how the prudential supervisor —- whether outside or inside the central bank —- fits into this.)

Eligible collateral, valuations, and haircuts

Eligible collateral (for the Window) should be as wide as possible consistent with it comprising instruments that the leaders of the central bank are capable of understanding and managing, both when the counterparty is a going concern and after default. To take an extreme example for purposes of illustration, during the GFC we were not going to take as collateral the oil tankers or power stations owned by some SIFs. To be clear, that question was never on the horizon in practice, but it was matter of making clear within our internal debates that lines had to be drawn. I return to this, more practically, in Part 4.

Valuations should be robust, and the method of valuing different types of collateral —- market price (at the selling price), model-based, or whatever —- should be publicly disclosed.

Since haircuts matter only where a borrower has defaulted, they need to be set for stressed circumstances. Certainly, the central bank should not follow the market when buoyant market conditions cause practitioners (and sometimes clearing houses) to reduce margin requirements, and so on.

Further, where spillovers from a firm's failure would very likely exacerbate problems in the economy and markets and that would impair recovery rates, there needs to be an add-on to the haircut. So, picking up a question from Part 2, SIFIs should be subject to higher haircuts, as collateral they had pledged would likely be realised in highly adverse market and economic conditions.

Finally, the central bank (consulting government) needs to set haircuts for different instruments. One standard might be to try to achieve the same expected loss as if the collateral was a treasury bill. But the point I want to underline is about consciously having and sticking to a consistent standard, subject to exceptional circumstances (which might be one door to ELA: below).

Pre-positioning collateral as the driver of systemic-safety policy

I believe a fit-for-purpose LOLR regime has banks --- meaning each banking entity within a group --- pre-position collateral. Although this is currently practiced in some jurisdictions, it is not yet the norm. Even where currently practiced, it is usually encouraged but, ultimately, voluntary. I would move to requiring pre-positioning.

The big question is how much. It would be sensible to favour a large share of short-term liabilities being covered by pre-positioned collateral. Indeed, I would go as far as 100%. This raises a variety of technical questions, some of which are addressed in Annex B.

Whether or not 100% cover is required, pre-positioning regimes should be thought of as contributing to LOLR planning. It is analogous to the resolution planning and resolvability assessments that commenced after the Global Financial Crisis. Indeed, on the approach I am recommending, LOLR planning --- for each entity with runnable/short-term liabilities --- would form part of any regime for recovery planning and resolution planning that was fit for purpose.

It should be emphasised that pre-positioning is not something that can always be implemented overnight but might in some cases take months if not years. Notably, pre-positioning portfolios of loans often involves the underlying borrowers formally agreeing to the transfer of the claims on them to a securitisation vehicle. If no outstanding loans permit that (because, say, the lending bank's business model does not involve securitisation), it might be some while before there are enough compliant new loans for a meaningful amount of loans in ABS form to be pre-positioned. Even where, as at the Bank of England, portfolios of some kinds of raw loans are eligible, the central bank needs to equip itself to collect the debts if the lending bank defaults on LOLR assistance. That underlines the importance of planning ahead, and of thinking in terms of implementing a regime rather than just responding to events.

Where there will be extensive delays before a tolerable amount of collateral can be pre-positioned with the central bank, the supervisors should encourage the bank quietly to curtail its risk taking and liquidity mismatches. This is important where the bank has been experiencing problems of various kinds or is systemic. If management or board reject such encouragement, there is prima facie evidence that the bank is not being run prudently and that some or all of its officers are not (in the English expression) fit and proper to control or manage the bank. In those circumstances, the supervisors should explore whether their formal powers are exercisable, on the grounds that the firm no longer meets all the statutory conditions for being authorised (or for being authorised without formal restrictions on the operation of the business).⁵³

Lending into resolution

Central banks should be prepared to lend into resolutions and into conservatorships --- to all entities with runnable/short-term liabilities --- where they are satisfied that the solvency precondition is met and that their lending

⁵³ In my out-of-date experience, prudential supervisors moved during the 1990s and 2000s to thinking and acting primarily in terms of enforcing rules rather than using conditions (or revocation) when a firm no longer meets the licensing criteria. If still so, it plausibly makes it harder to act promptly.

will help facilitate a viable solution to the bank's problems or otherwise avoid or contain system distress. An obvious vehicle for this is the Window, and it is one I think central banks should be prepared to use.

But there is a case for a dedicated facility given the second condition (the plausibility of the solution, and the risks to the taxpayer if there are doubts about its plausibility). That is the route taken by the Bank of England with its Resolution Lending Facility (see Annex A). Where any such lending requires government approval (or guarantees), it should be considered a variant of ELA.

ELA

ELA is what is left. And something is always left because it is impossible for a published LOLR regime to cater for every possible scenario. The key thing is to learn from every significant LOLR episode and, if appropriate, factor it into the regular regime, including contingency plans.

Under the approach advocated here, ELA might be employed where, for example, the central bank needed to take a floating charge over a category of assets, or it was lending against instruments not included in its standard eligible list but which it was prepared to take in the circumstances (without lowering its risk standards), or where the assistance was part of a special rescue plan orchestrated by or under the authority of elected ministers.

In a number of jurisdictions, including the US and the UK, the defining characteristic of ELA (properly understood) is that it requires the approval of the elected executive branch of government.

Public liquidity backstops

I have been asked to opine on how large PLB needs to be. The answer is that, taken alongside LOLR from the central bank, it needs to be big enough to cover 100% of the liabilities that will run off or could run, plus 100% of the collateral calls that could be made by counterparties, clearing houses and others (including foreign central banks). Otherwise, as soon as market participants detect the possibility a cap might bite, a run will become turbo charged. Far from possibly deterring a run, a cap can have the perverse effect of accelerating a run.

PLB design also bears on the separate question of the division of labour between LOLR (including ELA) and a government line of credit (PLB). I tend to the view that reliance on a line from the Treasury politicises what could be technical issues, and so pollutes public perceptions and commentator debates on resolution. I think that is where the US finds itself, as FDIC resolutions of so-called Too-Big-To-Fail banking groups (and others) would rely on Treasury credit, which has been criticised as a bailout fund. This further underlines the utility of central banks having rigorous regimes for pre-positioning collateral to cover short-term liabilities.

Governance for the central bank LOLR

Good policies do not implement themselves. Credible institutions rely upon carefully crafted incentives. Regime design, governance and accountability all matter. Compared with the development of monetary policy during the 1990s, LOLR regimes have been relatively neglected, amounting mostly to accumulated innovations in response to events.

*Statutory regime: a responsibility to act as a **constrained** lender of last resort*

Just as central banks have a statutory duty to maintain price stability through their monetary policy operations, so they need to have a statutory responsibility to act as the lender of last resort, subject to constraints. By making them accountable, this reduces the risk of their declining to act as LOLR when they should. For jurisdictions where the central bank is independent, this approach is much better than the finance minister having a statutory power to direct the central bank to lend (as in the UK after the global financial crisis).

Some of the necessary constraints have already been discussed. The most important is not lending to banks that the central bank knows (or should know) are fundamentally insolvent. Beyond that, legislators can reasonably prescribe or proscribe eligible collateral, either in detail or in a general standard left to the central bank to apply. They might also address in legislation whether the central bank can lend to non-banks.

As with efficiency (above), it is desirable for accountability that central banks should publish how they plan to implement their LOLR responsibilities; that is to say, how they plan to exercise any areas of discretion granted to them by the law. Many already do a good deal of that by publishing the terms and conditions of various standing facilities, regular open market operations, and contingency plans for exceptional operations of various kinds. But more could probably be done. For example, not all central banks have communicated how they would lend into resolved banking groups (and others), which creates avoidable uncertainty among authorities (as well as within the industry and its creditors and customers).

Many central banks have discretion, under the law, to go beyond the terms of their published facilities, including their published contingency plans for exceptional circumstances. It is an important question whether a central bank can improvise entirely at its own discretion, or whether it needs political approval when it does so. The position in the UK, for example, is that, where it acts beyond its published regime, the Bank of England needs the approval of

the finance minister.⁵⁴ The US has no such standing arrangement but during the GFC the US Treasury and the Federal Reserve agreed a memorandum of understanding on how their roles fitted together. It has not been updated (at least in public).⁵⁵

Governance of LOLR within the central bank

In terms of both effective policy making and ex post accountability, it matters who within the central bank is responsible for LOLR decisions. First and foremost, the location of those powers should be clear. Second, where a central bank takes its monetary policy decisions by committee, then LOLR decisions should be taken by a formally constituted committee rather than left to the governor (meaning the top permanent executive of the central bank). That committee need not be same as the one for monetary policy. In the US, there are separate committees. In the complex euro area system, it is the same. Only full-time officers of the central bank, with accountability for the central bank's financial position (capital resources, profits, losses, and so on) should be members of such a committee. Unlike monetary policy, liquidity insurance is not a field where the high parameters of policy (for monetary policy, the interest rate) can be separated from its implementation.

Where LOLR decisions are taken by committee, it should be on a one person-one vote basis, with each member publicly accountable. Otherwise, a de jure committee structure can easily become de facto decision taking by the governor (board chair). The reason for one person-one voting is that egregiously bad mistakes are less likely if many voices are brought to the table and are properly incentivised to reveal their true view (rather than tack to office politics or political preference).

The committee should, within the constraints set by government and legislature, flesh out the regime and take difficult cases of non-routine

⁵⁴ Disclosure: this approach was proposed to (and accepted by) the Treasury in the early-mid 2000s after I had proposed it to then Governor Mervyn King.

⁵⁵ I have argued it should be renewed and kept up to date: *Unelected Power*, pp. 523-24.

operations or assistance. It should be accountable for any other decisions taken under its authority. This kind of structure will help to give bite to internal deliberations and aid accountability.

Transparency and accountability

Among other things, a central bank needs to be able to demonstrate ex post that its view on solvency etc was properly grounded and defensible. Drawing on stress-testing ventures, work is needed to articulate the framework used to make probabilistic assessments of solvency. The framework employed should be covered in internal ex post reviews by audit committees or independent examiners (or whatever similar internal structure exists). That framework can then be held up to the light: whether it was robust, employed with integrity etc.

Separately, information on any losses from LOLR should either be published or at least disclosed to key members of the legislative committee that oversees the central bank.

Then there is the vexed question of when and how LOLR operations of various kinds should be revealed publicly. Auctions are, of course, public events but bidding and use by individual firms are not. Publication of use of bilateral facilities is generally delayed (see Annex A on how the UK regime, with Treasury blessing, approaches this). ELA (in the sense used in this report) should be revealed only when it is safe to do so (which is sometimes immediately, but sometimes definitely not).

But, in a democracy, ELA should always be disclosed to the finance ministry, and I believe also to the chair (and perhaps deputy chair if from a different political party) of the parliamentary committee that oversees the central bank and the finance ministry. There is also a question of whether there should be a provision for the central bank governor and the finance minister to brief that parliamentary committee in camera, and under strict conditions of

confidentiality. This would be analogous to arrangements for briefings by the security and intelligence agencies in some jurisdictions. I am not in a position to judge whether anything like that, including credible confidentiality, is feasible in Switzerland.

Central banks' involvement in prudential supervision

So far, this discussion has ignored the relationship between the LOLR and the prudential supervisors. First and foremost, a central bank needs access to information on the banks it might find itself lending to. A decision to lend will not be a positive signal that a recipient is fundamentally sound unless the central bank has, and is known to have, access to private information. Conversely, a central bank is liable to err if it does not have more information than the market. So, information absolutely must flow freely between the supervisors and the central bank. There should be no question of supervisors declining to provide information on grounds of legal duties (statutory or otherwise) of confidentiality. I am underlining this because it has sometimes been a problem in some jurisdictions (including Britain). If necessary, legislation should put beyond doubt the duty of supervisors to provide information.

The frictions impeding information flows are often the basis for arguments that central banks should be involved, formally, in banking supervision. While I prefer that, I do not think it is absolutely essential that the central bank is the regulator and supervisor (or at least not the sole such authority).⁵⁶ But, to repeat, in a regime with a separate regulator, it is absolutely essential that society does not rely on cooperation and information-sharing between regulator and central bank being the product of goodwill or enlightened self-interest. There is almost unbounded capacity for turf problems in the public sector. So, even if not the de jure regulator, the central bank must have direct access to individual firms and a right to require information from firms materially relevant to its function as LOLR (and, more broadly, as monetary

⁵⁶ Tucker, *Unelected Power*, chapter 20.

authority). Japan operates a regime along those lines (as does Germany to some extent).

Further, whether or not it is formally the regulator, the central bank must have a formal say in framing and calibrating the regulatory regime. A separate supervisor cannot be expected to internalise the risks faced by the LOLR, especially if it is given (or takes upon itself) a goal of sponsoring growth in the industry or international competitiveness, and so on. Moreover, a liquidity re-insurer cannot sit silently if it believes the regulatory regime is fundamentally flawed. So, a credible LOLR regime entails the central bank being involved in regulatory and supervisory policy (as reflected in the composition of the Basel Committee on Banking Supervision, on which the SNB sits).

Even where information flows smoothly, the decision to lend to a liquidity-stricken firm should not be taken by the supervisors. So, prudential supervisors should not have votes on any LOLR committee.⁵⁷ Where banks fail, there are invariably accusations of supervisory incompetence, whether fair or unfair. That being so, forbearance, enabled by LOLR financing, is enticing for supervisors; a firm going into bankruptcy or resolution highlights their possible failings. By contrast, the decision to lend needs to be based on hard-headed assessments of solvency, the prospect of getting the money back and, in exceptional circumstances where the central bank goes beyond its standard regime (ELA), whether the assistance would serve a useful purpose. Supervisors should be involved but should not decide.

⁵⁷ Ditto where resolution is in the central bank. Both have conflicts, as the LOLR decision often involves judging the adequacy of their work.

PART 4: REFINEMENTS AND EMPHASES ON THE SWISS REGIME AND PRACTICES IN THE LIGHT OF CREDIT SUISSE

The issues raised in the first three parts of this report are desperately important to Switzerland and the wider world. That is because if Switzerland did not have a credible plan for the demise of Credit Suisse, interested actors and observers are bound to ask *what* is the plan for UBS, already one of a small number of global SIFIs, and now considerably larger than before the CS crisis.

Part 3 set out a model LOLR regime that I think Switzerland would do well to adopt in so far as its details fit the country's specific circumstances. Of course, there are specific circumstances, including the country's size, the significance to its economy of an internationally oriented banking and wealth-management sector offering services dominated in foreign currencies, and not least the regime it currently has. This part of the report picks up specific issues in the light of those specificities and places them in the context of the broad approach I advocate to LOLR regimes.

The Credit Suisse crisis in the context of the Swiss regime

The essentials, as I understand them, of the Swiss regime are summarised in Annex A. Drawing on some of those details helps to put the demise and handling of CS in context.

The 2023 edition of the SNB's publication on its mandate and functions was published roughly four months after Credit Suisse collapsed, and contains a summary of the SNB's LOLR assistance.⁵⁸ Briefly, this included three variants of ELA. The first comprised what the SNB terms "classic emergency liquidity assistance" under its usual approach to eligible collateral. The second was exceptional ELA (known in Switzerland as ELA+), made possible by a Federal Council (executive) emergency ordinance, under which the SNB lent not against specific collateral but with preferential rights (over other unsecured

⁵⁸ *The Swiss National Bank in Brief*, 18th edition, July 2023, p. 35.

creditors) in any bankruptcy proceeding.⁵⁹ Third, after the transfer of CS to UBS, the SNB also lent under the terms of a so-called Public Liquidity Backstop (PLB), a device announced by the Federal Council in March 2022 and introduced by emergency decree during the crisis. In the CS/UBS case, the PLB involved SNB having both preferential rights in bankruptcy and also a guarantee from the government. Each of ELA+ and PLB lending was capped, by the emergency ordinances, at Swiss Francs 100bn. The SNB has made the interesting and important statement that “the total liquidity support was calibrated in such a way that, together with the bank’s liquidity buffers, it could cover *virtually* all short-term liabilities of the bank” (my emphasis).⁶⁰ But, one might observe, only with less collateral, and so probably a greater risk for the public purse, than in a standard LOLR operation.

As to the scale and timing of LOLR support, the timeline published by the SNB on its own lending is as follows (all amounts in Swiss Francs):⁶¹

- Thursday 16 March 2023: 10bn from the monetary-policy LSFF (see below) and 38bn of ELA
- Friday 17 March: ELA+ of 20bn
- Monday 20 March (after the transfer to UBS): ELA+ of 30bn and PLB (via SNB) of 70bn
- By 31 May: PLB repaid, leaving ELA outstanding of 38bn and ELA+ of 50.⁶²

Contingency planning and the regime’s “systemic” focus

⁵⁹ The statutory preference did *not* put the SNB ahead of secured creditors.

⁶⁰ SNB, 2023 *Financial Stability Report (FSR)*, June 2023, p.8.

⁶¹ *FSR*, p.25. The information is not split into lending to specific legal entities, which will be relevant to refining and operationalising any reform package.

⁶² I assume that the LSFF lending was rolled into one of the other lines of credit. The SNB document says nothing (I have found) about whether other central banks provided LOLR to CS entities operating in their jurisdictions (whether as a branch or subsidiary). There was no LOLR during October 2022, with CS’s liquidity buffers apparently proving adequate when there were cascading withdrawals from CS banks (*FSR*, p.39). That is interesting and might have lessons for those privy to the relevant information.

Various hypotheses have circulated since March about what derailed the crisis plan for CS, leading to its effectively being transferred to UBS.⁶³ One is that, despite appearances at the time and since, it was in fact insolvent (or close to being so) but the resolution plan, agreed with Switzerland's international peers, proved flaky in the bright light of a real crisis. That is beyond the scope of this report. Other conjectures revolve around the provision of liquidity. Was the SNB simply stubborn or, on the contrary, willing to play its part but badly constrained by law? Alternatively, was too much of Credit Suisse's asset base already encumbered or simply unsuitable as collateral (on any reasonable standard), leaving too little to cover its short-term liabilities? Or, in a similar spirit, were too many unencumbered assets in entities that were not (at least initially) suffering a run and were for some reason barred from helping those parts of the group that were? Or, quite differently, were the authorities overcome by chaos, with too many fast-moving parts against a background of recovery, resolution and ELA plans being disjointed or incomplete? I do not know the answers, but some inferences can be drawn from SNB's recent publications. The picture is not straightforward but presents vital lessons for the design and operation of LOLR regimes. The objective ought to be find reforms that would be robust to more or less any of those possible problems, whether or not they were pertinent in the CS case.

Whatever the truth about the capital adequacy of CS as a group, and of its various legal entities, the proximate cause of its demise was a customer run triggered in significant degree by the accumulation of regulatory, cultural and legal problems, and the group's weak profitability. The run on the wealth management business not only drained funds but also impaired the group's franchise (and hence the credibility of its business plan). When, almost six months after the scare in October 2023, the run began in earnest in March 2023, there was insufficient collateral available to cover the liquidity shortage by borrowing from the SNB. A caricature --- but an instructive one --- of the episode is that *SNB could not provide LOLR assistance to the Swiss private bank*

⁶³ SNB discuss the events surrounding the CS failure in the 2023 *FSR* (pp.7-8, 30-31, and 38-39). SNB also write that, while winding down parts of the CS investment banking activities, the merged group will retain its existing strong focus on wealth management, which matters here because, as I understand it, the CS liquidity run was in significant degree on the legal entities housing its wealth management business (p.7). https://www.snb.ch/n/mmr/reference/stabrep_2023/source/stabrep_2023.n.pdf

because it did not have enough eligible collateral, perhaps because its functions had not been designated as systemically important, which proved a massive problem when its predicament infected the domestic retail bank, suggesting that it was after all --- and, given the shared brand and ownership, always had been --- systemically relevant for Switzerland.

In part, that take on events raises questions about the SNB's approach to eligible collateral as well as eligible recipients of LOLR (below), but the central bank also reports that the pot of potentially available collateral had been depleted by "the higher prepositioning requirements imposed by payment agencies and clearing institutions."⁶⁴ It is important to be clear about what that seems to mean: that private and for-profit infrastructure providers, and perhaps market counterparties too, might have been faster to require pre-positioning of collateral than the Swiss authorities (and maybe others).

That fits with a sense of missed opportunities for the Swiss authorities, including but not limited to SNB, certainly after October 2022, but in truth well before then. For example, why was not the PLB turned into law earlier? Perhaps for fear of scaring the horses. But by October the horses were already more than a little nervous. Alternatively, why was the bank not required to reduce its vulnerabilities in time?⁶⁵ Big picture, the period after October is reminiscent of the lost six months between the failure (and subsidised rescue) of Bear Stearns in March 2008 and the failure of Lehman that October.

But even if the Swiss authorities had acted pre-emptively once problems were broadcast --- to which we return below --- the nature of the group's underlying business would still have given rise to obstacles and dilemmas, particularly around LOLR collateral, eligibility, and planning.

Before the CS crisis, the SNB had said very little publicly --- perhaps more privately to some banks --- about its approach to LOLR. There were no public facilities except for handling payments-system frictions and, hence,

⁶⁴ *FSR*, p.39.

⁶⁵ This can involve encouraging a group *quietly* to de-lever its wholesale-markets trading book (it has been done), which among other things releases collateral supporting some existing positions and reduces contingent collateral (and so liquidity) calls.

stabilisation of the monetary policy rate of interest (the LSFF). LOLR support was to come via ELA, available to banks that were not only solvent (a good constraint for reasons set out in Part 2) but also systemic (questionable), and against collateral that seems mainly to have comprised mortgage loans to Swiss households (Annex A). Since the CS crisis, the SNB has usefully said more, although still not much by international standards. LOLR still means ELA, but some important possible changes are flagged as being under consideration. The SNB is considering making ELA available to banks operating in Switzerland that are not formally designated as systemic, and it is considering taking as collateral securitisations of foreign loans and instruments of various kinds, which is the tip of a big issue (Annex A).⁶⁶

The “systemic” designation and contingency planning

After the GFC, the Swiss authorities’ contingency planning was concentrated on groups —and, within groups, on functions — that had been designated as systemic by the SNB. Under the law, groups designated as systemic must have a resolution plan approved by the authorities. But the law also requires a special focus on emergency plans for activities and services designated by SNB as systemically important functions (for the Swiss economy: Annex A). If any such functions are located entirely within one legal entity (say, the group’s domestic retail bank) then, aside from the group-level resolution plan, the special emergency preparations that, as a matter of law, must be undertaken are focussed on that specific entity. In consequence, as a matter of law, FINMA is not required to generate, monitor and approve emergency plans in other legal entities not designated by SNB as providing vital functions, even if they are large, highly interconnected, and fragile.

In the rest of Part 4, I revisit elements of Part 3’s recommended model in the light of Switzerland’s particular circumstances. After going through borrowers, collateral and lending into resolutions or conservatorship, including pre-

⁶⁶ Link to SNB document published online during August 2023: [Swiss National Bank \(SNB\) - The SNB's role as lender of last resort](#)

positioning, this will return us to what can be learnt about contingency planning in the light of how the prevailing regime affected the CS affair.

Published facilities:

First, it should be said that, like some other international banking centres, Switzerland has a fine tradition of improvisation in the midst of financial crises. Perhaps the most notable example in recent history is the rescue of UBS in 2008 (so, not long ago).⁶⁷ In 2020, the central bank introduced the COVID-19 refinancing facility (CRF), under which it expanded its lending to the banking system against collateral comprising bank loans to the real economy guaranteed by the cantonal governments.

My strong recommendation is that Switzerland, and the SNB in particular, should move to the kind of approach advocated in Part 3: publishing the availability and terms of (conditional) liquidity-insurance facilities available to the banking system as a whole, thereby moving the boundary of ELA.

It might be inferred that the SNB remains sceptical about this. That, possibly, is the implication of its comment that “renaming an emergency facility as an ordinary facility...would...not be a solution” to the risk of disclosure prompting or exacerbating a run. I do not share that judgment. If an ELA operation was intended to pre-empt a run but, for whatever reason, becomes known, the word “emergency” makes it very likely the public and others will run. This played a part in Britain’s Northern Rock debacle.⁶⁸ In my judgment, the SNB’s

⁶⁷ Broadly, the UBS rescue involved transferring a bunch of bad assets into a realisation vehicle backed by the state and funded by the SNB but in which, interestingly, UBS had an interest, from which it benefited half a decade or so later. In slightly more detail, SNB together with the finance ministry and the then banking commission established a “StabFund” to manage 39BN of illiquid UBS assets. SNB then provided emergency liquidity (to the Fund), and UBS took up to USD 75BN from the US Federal Reserve’s commercial paper (CPFF) facility over 2008-9. UBS also had to undergo a technical solvency assessment by Swiss authorities and was declared “solvent”. See this SNB [2013 deck](#).

⁶⁸ Once the existence of the Bank of England’s ELA was leaked, the press were briefed that it was an emergency, which could hardly have been less helpful. The opening sentence of the FT story the following

error is to argue as though the risk is binary (on/off). Rather, it is not that ordinary facilities eliminate the risk but that they reduce it. While this might be irrelevant to the way the CS collapse played out, one day it will be germane to some other situation faced by the Swiss authorities.

But the broader point, as underlined in Part 3, is that publishing a regime for LOLR, with the terms and pre-conditions for permanent and contingent facilities set out, would force the Swiss authorities to do more liquidity contingency planning and preparation than up to now. That has the big advantage of making the authorities face up to disagreements (within agencies, and between them) during financial peacetime rather than in the midst of crisis, when there is already more than enough to do and, further, other actors (private and political) will have all sorts of interests to pursue. From a distance, those considerations seem germane for Bern and Zürich.

I shall argue below that the Swiss regime for designating firms and functions might be part of the problem, but that will make more sense after going through some of the core LOLR-regime design parameters recommended in Part 3. There is no need to dwell on the solvency constraint because, subject to one institutional issue, that is already SNB policy and seems to be taken for granted in Switzerland. A theme running through what follows is the vital importance of contingency planning.

Eligible counterparties:

That has a direct bearing on who (let's, for the moment, say which banks) are eligible to receive LOLR from the SNB. In the past, SNB has said it is restricted to banks that are systemic. That, drawing on Part 1, is untenable. While the designated SIFIs are almost certainly systemic in almost any circumstances, other banks could prove systemic in particular circumstances. To underline the

morning was "The Bank of England will on Friday throw a lifeline to Northern Rock by providing emergency funding to the beleaguered mortgage lender that has fallen victim to the liquidity squeeze in the banking sector." Financial Times, 14 September 2007.

relevance of this to Switzerland, CS having unravelled for reputational reasons, it should be recognised that only a few years ago the whole of its private banking industry might have experienced customer (and hence liquidity runs) when the sector was under a cloud.

If Switzerland introduces a Discount Window-type regime, it should give all banks access (subject to the precondition of solvency etc), reserving the systemic test for the ELA that lies beyond. Further, the test of systemic risk should be one of the prevailing circumstances, not whether or not a firm or group is on a list drawn up months (or perhaps years) before.

A separation of regular wide-collateral facilities and ELA would also make it easier to address the vexed question of whether LOLR should be available to non-banks because, in the main, it relocates the question to whether any shadow banks should ever have access to ELA. There is one subset of this matter that might well be highly pertinent for Switzerland: shadow banks within a banking group. By this, I mean legal entities that are not banks in regulatory law but which have balance sheets that are levered and even maturity mismatched. Imagine such a non-bank bank within a banking group experiencing a liquidity crisis. Either because it shares the group's brand name or just because it is well known to be part of the banking group, contagion to the group's banking entities is quite likely. The Swiss authorities are, I suggest, unlikely to be relaxed about any such entity failing. In that case, they might face a choice between direct lending and lending to one of the group's banking entries for on-lending. So, the authorities need to ask whether they are certain the indirect route would always be their preference, and whether it would be embraced quickly by the boards of the relevant banking entities. If there is uncertainty about that, then the obvious options are: (a) SNB changes its policy; (b) Swiss banking groups are formally forbidden from running liquidity risks (and maybe leverage) in any non-banking entities *anywhere in the world*; and (c) regulated banking entities extend committed lines to their non-bank bank siblings, and are subject to tighter liquidity requirements to cover those contingent risks.

LOLR into resolution and conservatorship:

Switzerland plans to put the PLB on a statutory footing, regularising (in terms of the values of constitutional democracy) the emergency PLB introduced by executive ordinance in the heart of the CS crisis. I suggest that this be dovetailed with a move to regular SNB LOLR versus ELA. Some lending to a resolved bank (coming out of a P&A or bailin resolution) is substantively identical to lending to any other bank, with the exception that the SNB would need to be satisfied the resolution had worked; a good test for the authorities, and where passed, reassuring to the markets and to citizens.

That would leave space for the PLB being utilised only where the conditions for using the regular, published facilities were not met, and a government guarantee is needed. The Government has an interest in avoiding giving the SNB a guarantee where, with some proper planning, it should not be needed. I return to this below in the context of governance.

Collateral:

Since the SNB is moving towards providing LOLR to banks in general and since it has been publishing more information about its approach (even though not yet taking the step to having a fully-fledged public regime), probably the biggest issue for the Swiss authorities is collateral. Not only has the CS crisis revealed major issues for central banks in general, there is also a sense in which it has blown up the SNB's approach to collateral, and in ways that conceivably raise major issues for the Swiss authorities as a whole. It is easiest to start with the specific set of issues.

The SNB does not currently publish the collateral that is eligible for LOLR. That can make sense when ELA is the residual measure used to address truly emergency operations not catered for in a well-designed public system, but not otherwise.

Big picture, apart from the securities it takes as collateral in its regular monetary operations (including the LSFF), the main instruments eligible in SNB's ELA (i.e., in its LOLR operations) have traditionally been Swiss mortgage loans. Quite apart from other hazards with this, it hardly suffices, except in special circumstances, for a banking sector in which private banking is a major part, with a lot of the wealth management business conducted in foreign currencies and, more to the point, foreign assets (including loans and, no doubt, all sorts of other instruments issued in other jurisdictions and backed by claims in those other jurisdictions).

Sensibly, the SNB has a criterion for collateral eligibility that, in the terms I prefer (and introduced at the Bank of England), requires it to understand and be capable of managing the instruments if held outright. In its own words, "The SNB cannot directly accept foreign loans due to their high local legal and realisation risks" (Annex A).

At first glance, this seems to mean that even though the SNB might be confident of being able to borrow enough foreign currency via its swap lines with the Federal Reserve, the ECB and so on, a liquidity-stricken international private bank (or wealth-management business, or investment bank) domiciled or operating in Switzerland might well not have assets that are useable as collateral with the SNB (however good the assets are). To be clear, this matters to the options that were sanely available to the Swiss authorities for handling CS. Even if it had, in fact, been insolvent but a bailin resolution had been perfectly planned and executed, it seems plausible that the SNB was not placed to provide LOLR assistance on a sufficient scale if there had been a massive run when the recapitalised bank was relaunched into the world. The availability of ELA+ and the PLB to support the transfer to UBS might put that into question, but it is not clear whether the Swiss authorities were ready to keep lending long enough to have made other possible routes feasible.

To the extent that anything like that is (or were in the future to become) an accurate statement, then either those banking operations would need (severely) to curtail their liquidity mismatches or, alternatively, move to the

jurisdictions in which the underlying assets were created. That this seems not to have been resolved before the CS crisis --- or since -- highlights the utility of contingency planning (for all banks, not just domestically significant ones) and also of having a published framework that forces the authorities to confront issues (whether affecting all banks or any particular bank).

That sounds dramatic, but there is more to be said. The text quoted above continues:

“However, the SNB does accept foreign loans if they are in the form of asset-backed securities (ABS) and the said legal problems have been resolved as part of the securitisation process. When assuming loans directly, other central banks also focus on loans within their own jurisdiction.”

The last statement is, perhaps, not 100% complete. An important question here is how far central banks seek to overcome those obstacles by encouraging banks to package portfolios of foreign loans into securitised form even when there is no intention to issue the asset-backed security into the market. I recommend that the SNB discuss this in detail with its foreign counterparts. In that connection, it also has to be said that the population of Swiss-domestic collateral relative to the size of its banking system might well be much smaller than the ratio of domestic-law collateral-to-banking industry size in the UK given the extent to which entrepot business is written and transacted in London under English law.

Pre-positioning

Given those issues around using foreign assets as collateral, pre-positioning --- again, by every bank or banking-group entity with runnable/short-term liabilities --- would be especially useful for the Swiss authorities as it would ensure that SNB had to get to the bottom of what exactly is available where, what obstacles need to be overcome, and whether they can be overcome to the satisfaction of the Swiss authorities (plural).

For that reason, merely encouraging Swiss banks (and maybe others) to pre-position some assets is unlikely to suffice. What would the Swiss authorities, perhaps via FINMA, do if banks, including the largest, made half-hearted efforts, leaving the SNB unable or unwilling to lend on the needed scale and speed if and when those banks suffered a run?

If, as I strongly recommend, the SNB adopts a pre-positioning policy, it would sensibly study the New York Fed and Bank of England systems (see Annex A).

Contingency planning: CS case redux, with a big lesson for Switzerland's banking regime

Summing up, it helps to unbundle the significance of the two very different senses in which "systemic" is used in the Swiss LOLR regime. First, although in the past the SNB said that ELA was restricted to systemic banks, that is (and was) not a legal constraint (even in secondary legislation) but was a self-imposed policy that the SNB was (and is) free to waive without notice. By contrast, second, the statutory requirements for an emergency plan monitored --- and if necessary enforced --- by FINMA are limited to those systemically important functions formally designated by SNB in banking groups formally designated by SNB as systemic (Annex A). The significance of this goes to the capacity of the Swiss authorities to make banks, including entities within systemic groups that do not conduct systemically important functions, prepare for ELA by packaging and pre-positioning collateral that the SNB would take in ELA. This is a big deal.

Concretely, if, as seems possible, some important CS entities, including the locally domiciled subsidiary housing the wealth management/private banking business, did not have enough eligible collateral when the dam broke, an important question is whether the authorities could have intervened earlier to make those business units prepare for the possibility of ELA. Obviously, a bright amber light was flashing rapidly after the mini run during the autumn of 2022. As SNB points out in general terms, however, even six months might not

have been long enough to package into a suitable form loans governed by foreign law. How much was done and could have been done is an important question for the Swiss authorities, and one I cannot (and am not mandated to) answer.

But assuming six months was not long enough, there is the question of whether the Swiss authorities could have started the process much earlier, when CS's stumbles were recurrently in the news. The FSB issued its guidance on funding in resolution in 2018. The Bank of England issued its own requirements in 2017, giving banks until 2022 to get ready. If work in Switzerland might have begun earlier, there is the question of what authority the Swiss agencies had to make CS (and others) comply.

The obvious starting point is FINMA's powers of intervention. If it had concluded that CS no longer complied with all the statutory criteria for authorisation, it might have been able to exercise powers to make the authorisation conditional on preparing for a liquidity run across the group, including satisfying SNB on the sufficiency of available collateral. If FINMA has no such powers, SNB might usefully have argued the regulator needed them, and in any case the authorities need now to ensure it does have them.

That would not have sufficed if the lead times for packaging and pre-positioning with SNB a sufficiently large value of collateral were very long, given the nature and governing law of the businesses' assets. What "very long" means here is that, to be ready by the spring of 2023, the exercise would have needed to begin so many years back that FINMA's powers to impose de jure or de facto conditions on the relevant CS banking licenses would not have been exercisable because there was no material reason for holding that the authorisation criteria were no longer satisfied.

That leaves, perhaps, informal suasion. That might be thought alien to Swiss traditions, and in any case operates elsewhere in the shadow of more formal powers, so the question of powers is still pertinent. While suasion seems, from a distance, to have been quite potent when the Swiss authorities drove through the rescue of CS, that exercise did also involve emergency ordinances.

Maybe, therefore, an executive ordinance, or even legislative amendment, could have been used to get the banking system, and the two banking SIFIs in particular, to comply with cross-group, entity-by-entity ELA preparation years before the CS debacle.

Whatever the answer, the law does now need to change. A statutory requirement for emergency planning cannot sensibly be confined to entities that undertake vitally important functions --- domestic or foreign --- because they might be brought down by problems in other parts of the group to which they belong. In a nutshell, it is not only banking entities providing vital local services that matter but also those entities whose demise could spill over into them. The latter could be regarded as *indirectly* systemic.

Taking the big picture, the Swiss authorities might, therefore, want to place some weight on the possibility that the standing and even viability of Swiss finance (in whole or parts) might be undermined if they seem indifferent to the plight of entities and businesses not providing directly vital services. That was a major consideration for the British authorities when ring-fencing for large domestic retail banks was introduced.

Governance: the tripartite system

There is a fairly widespread perception, possibly unfair, that SNB prefers to keep itself a little distanced from financial stability issues during peacetime, and, separately, is sceptical about resolution. If this is just perception (with no substance to it), that is good news but the perception must be corrected. Even if SNB disagrees with my judgment that there is such a perception, I would encourage them to conduct themselves as though it is a serious possibility or risk. A speech by the governor would help. This could usefully be followed by an annual speech on the topic (sometimes given by another board member but occasionally by the chair).

In any case, given the importance of liquidity --- at both group and entity levels --- for recovery, resolution and conservatorship planning and preparations, the SNB needs to be intimately involved in all of them. There is an important question about whether the SNB should have new statutory responsibilities and powers in this broad area, but that lies beyond my terms of reference. Practically, though, the SNB's powers, policies and capabilities are vitally important to such plans whoever is formally responsible for them.

SUMMING UP, AND HEADLINE RECOMMENDATIONS

The bottom line in the Credit Suisse affair is that the Swiss authorities proved woefully unprepared to head off or contain the firm's unravelling even though, first, it had been designated as systemically important for many years and, second, it trailed its problems for many months. At home, this requires quite extensive reform, most certainly including to the regime for lender of last resort help from the Swiss National Bank. Abroad, it should be causing sleepless nights among central bankers, supervisors and resolution agencies because CS was surely systemic for many of them too. Their political overseers should be wondering, therefore, whether their own plans for local firms are as good as made out. Perhaps they are, but many had thought Switzerland to be in the vanguard after the Global Financial Crisis (GFC).

The point is not that the transfer to UBS was a bad choice; I am not in a position to judge that, nor mandated to do so. The point is, rather, that technocratic officials owe it to the public (and, hence, their elected representatives) to ensure that ministers have the widest set of feasible options when a bank is in difficulty, so that they are not presented with a choice between chaos and a taxpayer-backed bailout. Resolution regimes fall into that space, but so too do LOLR regimes.

What's more, they are linked. A resolution regime not backed with a rich and credible LOLR regime is a bet against nature. But, conversely, the LOLR is placed in an almost impossible position --- either lending when it should not

or, alternatively, dumping the problem on ministers and taxpayers — if there are not rich, credible regimes for prompt corrective action, recovery, resolution, and conservatorship.

Headline recommendations

Concretely, then, my recommendations, set out more fully in Parts 3 and 4, can be summarised under the following five headings.

First, Switzerland should amend the law on systemic designations so that formal emergency planning is not confined to activities that are deemed, in themselves, directly vital for Switzerland.

For the time being, Switzerland has a more concentrated domestic retail banking system because, it seems, the authorities did not take the non-retail activities of the biggest groups seriously enough. Those activities can, very obviously, be systemically important for Switzerland indirectly.

Moreover, while distress in some very large and highly inter-connected financial groups will be systemic whatever the circumstances, history has long demonstrated that distress at almost any banking institution can prove systemic in some circumstances.

Second, LOLR help should be available to all (fundamentally solvent) banks, and against the widest possible classes of collateral that the SNB is satisfied it understands, can risk manage and, vitally, collect or realise after default.

For Switzerland, this might present important questions about which of the assets of some kinds of banking operations can sensibly be taken as collateral. I have in mind things like leveraged loans to private-banking and investment-banking customers. But to be clear, I do not have a view on what SNB should

conclude after proper examination, including learning any lessons from its international peers.

Third, SNB should articulate those changes (and others) in the kind of published regime set out in Part 3.

Ideally, legislation would require SNB to do that, subject to vital constraints on solvency and so on. If SNB had to publish a LOLR regime, it would have no option but to get to the bottom of and resolve many technical questions (not least on collateral). That would have the inestimable benefit of avoiding SNB (and its domestic partners) finding themselves addressing those questions only in the midst of incipient crisis, with all the political machinations and distorted incentives that so often brings.

Much of what is known today in Switzerland as “ELA” would become part of the SNB’s public regime of codified facilities. That would not include any “ELA+” of the of the kind the SNB found itself extending to CS (uncollateralised lending with priority over other unsecured creditors).

ELA (properly understood) should be what lies beyond those published and codified facilities and operations. It naturally involves more intimate consultations with the finance ministry — precisely because the central bank is going off script — and possibly also government indemnities (and, so, in effect, political authorisation since the assistance is then provided with upfront fiscal support). In this richer framework, what was called “ELA+” in the CS case becomes an example of, more simply, ELA. Lending against a floating charge over a portfolio of assets about which the central bank knows little — or, as in the CS case, with special recovery rights granted by emergency ordinance — is not something that, given the fiscal risks, can easily be undertaken at the sole discretion of an independent central bank.

The governance arrangements for ELA (so conceived) will need very careful articulation. Among other issues, it would be important to cover how it fitted with Switzerland’s statutory Public Liquidity Backstop.

Fourth, that published LOLR regime must include how liquidity support will be provided to a bank in resolution or conservatorship.

In that connection, the Swiss government and legislature should ensure that the authorities do have a conservatorship tool enabling them, in effect, to steer a truly solvent but irretrievably broken firm to shore. Likewise, they must identify any lessons from the CS crisis for their resolution regime and planning that were not linked to liquidity-insurance difficulties.

The authorities should give very serious consideration to whether the SNB should have the formal power to trigger resolution. Plainly, once it has granted LOLR assistance, it can do so in effect by calling its loan on the grounds the borrower is no longer fundamentally solvent (in the sense described in Part 2) or any other reason. The question is, then, whether it should also be able to do so before it has granted LOLR. The Expert Group aired this possibility.

That goes to the broader question of how far the SNB should be formally involved in prudential supervision. At present, as a matter of law, the SNB's mandate says only that it has "the task of contributing to the stability of the financial system" (Annex A). This strikes me as wholly inadequate, and that is certainly how it turned out in Britain in the run up to and early stages of the GFC. Such provisions leave the central bank with great power --- including whether or not to provide LOLR help; and how, and how much, to prepare in advance --- without obvious responsibility and accountability. That old problem has largely been solved for monetary policy, including in Switzerland. It should also be solved for the central bank's role in financial stability, which is rooted mainly in its being the LOLR.

Fifth, therefore, at the centre of the SNB's LOLR regime should be a rigorous policy requiring banks to pre-position collateral with the central bank to cover a high proportion of short-term liabilities.

Ideally, that would be a statutory obligation of the SNB. There is an important question as to which of the SNB, the Federal Council or the legislature should decide what proportion of short-term liabilities must be covered. (Whoever decides, I would go for 100% as otherwise there is a residual risk of nasty surprises that end up rocking the system.)

This approach has LOLR policy making and practice transformed away from being a once-in-a-blue-moon event that too often catches central bankers off guard, engulfing them until the crisis of the moment passes, and then being laid aside again after a spasm of public interest in lessons and recriminations. Instead, it becomes a core part of the central bank's day-to-day activities, involving governors on a regular basis. Just as many staff rightly work on monetary policy every day, so many staff need to work on collateral packaging, vetting, pre-positioning, valuation and re-margining every day.

The need for this change is such an important lesson from the CS affair, with significance for both Switzerland and every other major banking centre, that it warrants elaboration and reinforcement in the closing section of this report.

Collateral pre-positioning and lessons from the CS affair

Part 4 rehearsed views that circulate on the impediments that might have narrowed the options available to the Swiss authorities when it became obvious CS could not continue to operate without help. Whether or not all or any of them were in fact pertinent in the CS case, they could be in others. A good policy will be robust to any of those problems, and more.

I believe that, whatever the problems that in real time constrained the handling of CS, pre-positioning collateral --- once again, by all relevant legal entities --- would have reduced, and possibly even avoided, them. How far it would have helped would have depended on how long pre-positioning had been required before the storm clouds gathered, on the percentage of short-term liabilities covered, and on how exacting the central bank was in the

granular implementation of the policy (crudely, whether it was done properly). That said, some directional observations can be made.

- If the problem was that too many assets were encumbered elsewhere when CS unravelled, then with pre-positioning in place the SNB (and so FINMA) would have had to have agreed to that, letting the percentage of covered short-term liabilities stand at an inadequate level. If the problem was that too many assets were pre-positioned (but not encumbered) elsewhere, ditto.
- If the problem was the lead times in getting potentially eligible assets into a form where they were acceptable as collateral at SNB, and hence for pre-positioning, that process would at least have been underway, with the authorities (including the finance ministry) seeing the shortfall, and so having an earlier opportunity, in the meantime, to restrict the business of CS in various ways and to prepare contingency plans.
- If, more profoundly, the business model of some CS entities was such that there simply were and would not ever be sufficient collateral to cover a run on them, the regulators could have required any such entities to fund all such fundamentally ineligible assets with equity and long-term debt or, alternatively, to alter their business model and asset base. In other words, they would have known, and could have acted. Part of the utility of a prescribed level of cover is that it can fit with a requirement for prompt corrective action when it is not met.

All that said, therefore, it is a sobering thought that, while not a cure for whatever cultural and business-model flaws caused CS's underlying problems, its balance sheet could have been more resilient if pre-positioning had been used (for all of CS's banking and shadow banking entities), and certainly the authorities would have had a better line of sight on the liquidity fragilities *across* the group, entity by entity. This matters greatly for the future: most certainly for Switzerland given it still the home of a global, systemically significant financial group, but not only for Switzerland.

Pre-positioning as a core central bank function

As well as being useful, pre-positioning changes the nature of the supervisors' and central bankers' dialogue with banks. It cuts through the kind of slide-pack-based exchange that, in the hands of well-resourced firms, can get more and more complicated as bankers argue against strengthening their balance sheet in some way or other. Instead, pre-positioning shifts the exchange from the mezzanine granularity of C-suite discussions to the ground-level granularity of an actual operation. The central bank LOLR preparations are then not like PowerPoint-based negotiations but, rather, become something closer to: Give us collateral to cover x; thanks but the following instruments are not what you said you would be providing; oh, that's all you've got, then the haircut is a high y% (or no, we cannot take that at all), and we need a different kind of conversation with you.

In some ways, that harks back to the origins of LOLR. When, during the canonical crisis of 1866 that prompted Bagehot to write *Lombard Street* (Parts 1 and 2), my predecessors walked over to Overend & Gurney, it was not for a conversation with the partners but to look at their book: what have you got that we will take, and are you fundamentally insolvent? Today, pre-positioning technology can professionalise at least some of that.

In doing so, pre-positioning and LOLR planning more generally, alongside resolution planning, move the prudential regime to working backwards from the possibility and costs of failure, and how to cope when it happens.⁶⁹

Two messages are, then, worth underlining again. The first is that collateral policy and management is (or must become) a core central bank competence. What steering interest rates is to monetary policy, so collateral management is to the central bank's role in financial stability policy. That means that elite staff must work on collateral policy, with a status similar to that of their monetary

⁶⁹ It is striking that a recent IMF paper on lessons from the early-2023 banking failures seems to remain stuck with a model of relying on reducing the probability of failure rather than coping with it: Tobias Adrian et al, "Good Supervision: Lessons from the Field," IMF, WP/23/181, 2023.

policy and monetary operations colleagues. Among the executive board (so, at the SNB, the Governing Board), at least one member must be truly expert (from end to end), and the others, including the chair, must be highly literate, so that they can participate in decisions and explain them properly in public.

Second, the central bank LOLR cannot safely hold itself apart or aloof from ongoing work to ensure resolvability (in the broadest sense), stepping in as the financial equivalent of the US Cavalry only when disaster is engulfing a bank or the system at large. A published regime will help with that. It will also help clarify where accountability lies when things go wrong, which in turn will help incentivize the central bank to push the supervisors to act promptly (even pre-emptively) and for a regulatory regime that makes that a realistic option.

Pre-positioning and Swiss banking

Given the CS events and, importantly, the SNB's recent published comments on the lead times in getting collateral lined up (Annex A), it would be rational for Swiss banks --- certainly the largest, and certainly also any other private-banking businesses funded by runnable/short-term liabilities, but by no means only them --- to be queuing up to pre-position instruments with the central bank. If that is not happening, the authorities (as well as bank boards) should be concerned.⁷⁰

It is, therefore, to be welcomed — and deserving of publicity — that the chair of the SNB governing board has recently publicly embraced the need for pre-positioning.⁷¹ He is, moreover, correct to say that the nature and scale of the needed reforms to the Swiss stability financial regime will take time. I would strike a different note, however, when he cautions against "quick fixes." While I agree, of course, that such patchwork will certainly not be enough, the authorities should take any measures as soon as they can to put themselves in a better position if other Swiss banks were to hit choppy waters sooner rather

⁷⁰ I have not asked whether that is happening.

⁷¹ Thomas Jordan speech to the SBN Annual meeting:
https://www.snb.ch/en/mmr/speeches/id/ref_20230428_tjn

than later. That exercise strikes me as pressing, and should be pursued even though deeper reforms, taking longer to implement, are vitally needed.

Concluding, a good guiding principle for crisis management planning is that if something has happened in the past or has happened somewhere else, it can and eventually will happen again --- here, today, or tomorrow --- unless there is some *fundamental* difference that means it *cannot* (which is not the same as *probably will not*). That banks can fail has very obviously driven international policy on recovery and resolution. But, as the SNB and its Swiss partners and political overseers have discovered, the same unpleasant fact needs also to drive policy on LOLR. This is not a matter of surrendering to the ghoul of moral hazard, as a fit-for-purpose central bank collateral policy can, via excess collateral requirements, make clear to banking groups which parts of their book of assets needs to be funded by equity or long-term debt rather than the runnable debt that, sooner or later, will run.

In that spirit, just a few days before my report was submitted to the Swiss finance ministry, on Thursday 21 September the central bank board made the following announcement at a press conference:⁷²

“An SNB initiative designed to expand the possibilities we have for making liquidity available to banks. The aim is to ensure that should the need arise, the SNB will in future be able to provide liquidity against mortgages as collateral to all banks in Switzerland that have made the requisite preparations. This possibility has already been available to systemically important banks. The initiative was launched in 2019 and implementation began last year with a pilot project. The SNB duly informed all banks at the end of July.”

It is a good step. It is not enough --- not for Switzerland, not for its international banking peers.

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https://www.snb.ch/en/mmr/speeches/id/ref_20230921_tjnmsltmo/source/ref_20230921_tjnmsltmo.en.pdf

ANNEX A: SOME CENTRAL BANK LOLR REGIMES

This annex summaries the LOLR regimes of the US, UK and Euro Area, roughly structured by the benchmark regime advocated in Part 3, together with some slightly more detailed description of the Swiss arrangements.⁷³

United States

The central bank of the United States serves a federal state, operating under federal law. It is divided into twelve regional banks (which have private ownership) and the Federal Reserve Board in Washington D.C. It operates alongside other federal agencies that can mobilise resources during a crisis, notably including the Federal Deposit Insurance Corporation, the Federal Home Loan Banks, and of course the US Treasury.

The deposit-insurance-cum-resolution fund, and the credit line from the Treasury

The US has a funded deposit-insurance system, with the fund available to be used in resolutions conducted by the FDIC, subject to a constraint of cost-effectiveness for the deposit-insurance fund (relative to the option of liquidation and payout). Where the fund is exhausted, the FDIC can borrow from the US Treasury (UST). Losses to the fund and any loans from UST are covered by subsequent levies on banks.

As at 31 March 2023, the size of the deposit insurance fund was \$116bn. To put that in perspective, that was just over 1% of total insured deposits. In other words, in terms of liquidity as opposed to loss absorption, the fund is not a substitute for a money-issuing LOLR.

The Dodd Frank Act created, in addition, a line of credit from the UST to the FDIC in order to support Title II resolutions of TBTF financial groups (the Orderly Liquidation Facility, or OLF). OLF funding is ideally secured, and also

⁷³ I have not checked this text with the relevant central banks but have done my best to capture the germane features of their regimes in, inevitably, broad and approximate terms. To the extent the SNB is interested in my proposals, it will need to have a team make much more detailed comparisons.

takes priority in bankruptcy (like the Swiss PLB). If necessary, it is recovered from the rest of the industry. Politically, although it was designed to help with liquidity strains in resolution, it has been perceived as a taxpayer bailout fund.

Although the Fed has rolled over outstanding loans to banks after they went into resolution, I am not aware of the Fed saying much about lending new money to a bridge bank (or company) or to banks coming out of resolution. As a matter of law, I believe it is possible. In any big resolution, I think it will quite likely come to that, not least as a signal of confidence.⁷⁴

The Home Loan Banks

Other than the Federal Reserve itself, many US banks are able to borrow from the system of Federal Home Loans Banks (FHLBs). This source of emergency help has almost certainly been used at times to avoid Fed facilities perceived as stigmatised.⁷⁵ But the FHLBs do not create money, are therefore constrained, and might even need at times to turn to the Fed itself (which might need special authorisation to lend to them: see below). The Swiss government should not follow this route, nor let this part of the US set up add noise to their deliberations on LOLR assistance and support.

The Federal Reserve LOLR: a regime

The responsibilities and, more important, constraints on the Federal Reserve are based on Congressional legislation. Some cover lending to primary dealers against high-quality collateral via Open Market Operations (OMOs). Others are incorporated into the Federal Reserve Board's Regulation A, which is essentially a codified regime for routine and exceptional lending by the Federal Reserve system.⁷⁶ The key provisions in primary legislation relevant to LOLR operations, including ELA, are:

⁷⁴ For a comparison of the US, British, Japanese, Canadian and EA (but sadly not the Swiss) regimes for resolution funding, see Sebastian Grund, Nele Nomm and Florian Walch, "Liquidity in resolution: comparing frameworks for liquidity provision across jurisdictions," *Occasional Paper Series* No.251, ECB, December 2020.

⁷⁵ See the following blog piece by Steve Cecchetti and Kim Schoenholtz:

<https://www.moneyandbanking.com/commentary/2023/8/2/reforming-the-federal-home-loan-bank-system>

⁷⁶ For Regulation A: <https://www.ecfr.gov/current/title-12/chapter-II/subchapter-A/part-201#201.1>.

- The Fed may lend to depository institutions in the US (including US branches of foreign banks) provided it is satisfied the collateral is adequate
- It may lend to non-banks, via broad-based facilities, only with the permission of the Treasury.

Within that first statutory umbrella, the Fed has a published regular regime for lending to individual depository institutions against a wide class of eligible collateral via its Discount Window.⁷⁷ The Window has two parts: primary credit, and secondary credit. Broadly, primary credit is meant to be unquestioned and, so, for banks about which the Fed is not at all concerned, whereas secondary credit is for weaker firms and comes with more checks and strings attached. The latter is for a short term only except where the Fed concludes that lending for longer would help bridge to a resolution. The intended distinction is not always recognised by market practitioners, leaving primary credit more exposed to stigma than some think warranted.⁷⁸

Unlike the ECB and Bank of England (see below), the Fed does not routinely hold auctions for repoing against wide collateral for longish maturities.⁷⁹ But it has improvised in all sorts of ways, for both banks and non-banks (see below).⁸⁰

An innovation during the GFC has, at least formally, become a stand-by contingency plan: this is the Term Auction Facility which is, essentially, an auction version of the Window. It has been incorporated into the permanent regime (para 201.4(e)(1) of Regulation A), although the Fed's willingness to use it is unclear.

⁷⁷ Individual loans are made by the regional Federal Reserve banks (to banks in their district), subject to complying with standards set by the Federal Reserve Board in Washington D.C. I think the Board could exercise its right to set standards more actively than it does, but the US governance is, I believe, irrelevant to the Swiss case.

⁷⁸ See Susan McLaughlin, "Lessons for the Discount Window from the March 2023 Bank Failures," Yale Program on Financial Stability, September 19, 2023: <https://som.yale.edu/story/2023/lessons-discount-window-march-2023-bank-failures>

⁷⁹ Since 2021, there has been a Standing Repo Facility against which dealers and banks can borrow overnight against mortgage-backed securities as well as government paper, but the facility's overnight feature means it serves the purpose of putting a ceiling on the overnight rate of interest rather than providing LOLR help in the sense discussed in this paper.

⁸⁰ For Fed improvisation during the GFC placed in the context of LOLR principles, see the speech at the 2009 Jackson Hole conference by then Fed Board director for monetary affairs Brian F. Madigan, "Bagehot's Dictum in Practice: Formulating and Implementing Policies to Combat the Financial Crisis," Federal Reserve, August 21, 2009.

Collateral

The Fed has long accepted a wide range of collateral in its Window.⁸¹ This includes some foreign loans packaged into securities with high ratings agency ratings.⁸²

The regional Federal Reserve Banks accept a wide variety of domestic loans as collateral in the Window. On foreign loans, the Fed says this (my emphasis):

“Out of concern for a Reserve Bank’s ability to perfect and enforce a security interest in loans to foreign obligors, a Reserve Bank either accepts such loans as collateral only in limited circumstances or does not accept foreign obligor loans as collateral. Institutions wishing to pledge foreign obligor loans should contact their local Reserve Bank to determine whether it accepts foreign obligor loans as collateral and if so, under what conditions. The discussion below is provided only as general guidance.”

The italicised words express the same practical concern as the SNB has in some of its recent statements on LOLR. The difference is that the US economy --- and hence the availability of domestic loan collateral --- is large relative to the size of its banking system, whereas the reverse is true of Switzerland. That raw fact gave rise to the “too big to save tag” during the GFC (which I am not going to attribute, but which reflected a genuine concern, misplaced or not).

But also note that the Fed does not issue a definitive and blanket “no.” That strikes me as sensible even for the US as, however remote the possibility, one day it might find itself taking foreign loans to contain a crisis, so it would be sensible to plan for that.

Collateral pre-positioning

I believe that the Fed initiated the practice of encouraging banks to pre-position collateral with it in order to help make LOLR assistance more efficient. My sense, however, is that the Fed and its fellow US supervisors, at both federal and state level, have not pursued this with as much vigour as, say, the

⁸¹ https://www.frbdiscountwindow.org/Pages/Collateral/collateral_eligibility

⁸² Whether central banks can sensibly rely mechanically on Credit Rating Agency ratings is not addressed here. The Bank of England moved during the GFC to treating such ratings (only) as inputs into its decisions on eligibility.

Bank of England (which initially introduced pre-positioning in order to emulate the Fed in this area). That might be changing after 2023's US bank failures.

In particular, as revealed by the official sector reports on the failure of large regional banks during spring 2023, neither SVB nor others were set up, operationally, to use the Window at short notice.⁸³ This reinforces the lessons for SNB from its own crisis, and hence some of the core recommendations in this report.

In the wake of its regional banking crisis, the Fed together with the other U.S. federal agencies issued this guidance (July 2023), which seems sensible except for one point:⁸⁴

“If the discount window is a part of a depository institution’s contingency funding plans, the depository institution should establish and maintain operational readiness to borrow from the discount window. Operational readiness includes establishing borrowing arrangements and ensuring collateral is available for borrowing in an amount appropriate for a depository institution’s potential contingency funding needs. Depository institutions should ensure they are familiar with the pledging process for different collateral types and be aware that pre-pledging collateral can be useful if liquidity needs arise quickly. Depository institutions that include the discount window as part of their contingency funding plan should also consider conducting small value transactions at regular intervals to ensure familiarity with discount window operations.”

My reservation is the conditional nature of the first sentence (the “if”). The Window is part of the US economy’s contingency plan for banking distress whether or not every bank recognises that. Events this year have, sadly, underlined this obvious point.

Section 13(3) ELA

Where the Federal Reserve acts beyond its standard facilities (and legal variations of them), it must do so under the provisions of section 13(3) of the Federal Reserve Act. These were amended by Congress after the global financial crisis (GFC) to make them more restrictive. The Fed can now

⁸³ See the Fed report on SVB and the FDIC report on Signature:
<https://www.federalreserve.gov/publications/files/svb-review-20230428.pdf>;
<https://www.fdic.gov/news/press-releases/2023/pr23033a.pdf>

⁸⁴ Addendum to the Interagency Policy Statement on Funding and Liquidity Risk Management: Importance of Contingency Funding Plans, July 28, 2023:
<https://www.federalreserve.gov/newsevents/pressreleases/files/bcreg20230728a1.pdf>

undertake such emergency lending only via facilities with broad-based eligibility, which could include classes of non-banks. Such actions must be formally approved by a super majority of the Fed Board and by the US Treasury Secretary.

The section 13(3) provision was used massively during the GFC, and during the covid crisis. Masses has been written about this, much of it very important in terms of where the lines around unelected power should be drawn, but otherwise not of direct relevance to designing a LOLR regime.

During the GFC and its aftermath, and again in response to Covid, the Fed (in particular, the New York Fed) outsourced the management of some forms of collateral to private asset managers and others (subject, no doubt, to Chinese Wall conditions). I recommend strongly that the Swiss do not follow that example. I recognise that this will raise practical issues, but there is simply no substitute for both understanding and having hands-on control of one's core business, and lending against collateral is that for a central bank.

The United Kingdom

The Bank of England is the central bank of a unitary state, serving the whole of the United Kingdom. It operates under a charter of 1694, various statutes passed and amended by the Westminster parliament, and the common law. Since 2012, it has been (again) the prudential authority for banks, and it is also (under separate powers and with distinct governance) the resolution authority for banks. It operates alongside a deposit insurance agency, which in the UK is not funded. The other key actor is the Treasury, and hence also the Prime Minister of the day, at whose pleasure British treasury secretaries serve.

The statutory regime, the MoU with the Treasury, and Bank of England publications

Under its 1694 charter, the Bank can lend to anyone for any purpose other than commerce (i.e. roughly, it cannot deliberately compete with commercial banks). In other words, it is not restricted by law to lending to banks.

It does not have an express statutory responsibility to act as the LOLR (which I think a mistake), and the Treasury has since 2012 been empowered by statute formally to direct the Bank to lend to curb a financial crisis (which I also think a mistake, since it dilutes independence where a statutory responsibility would address the Treasury's legitimate concern).

Unlike the Federal Reserve, the LOLR regime is not set out in public-law instruments (ordinances or regulations) issued by the Bank. Instead, the Bank operates with its counterparties as contracting parties, with the contractual terms typically referring to general documents setting out the terms of each kind of public facility or operation. In addition, the Bank has issued an omnibus paper on its operational regime,⁸⁵ with many subsidiary documents specifying and explaining aspects of the regime (collateral, resolution funding, and so on).

There exists an important memorandum of understanding between the Treasury and the Bank on financial crisis management.⁸⁶ For LOLR, the core provision is that when the Bank acts beyond the perimeter of its published regime for the Sterling Monetary Framework (set out in what was traditionally known as the "Red Book"), it must obtain the permission of the UK's treasury secretary.

The Bank may, in those circumstances, seek an indemnity from the Treasury, which merely makes immediately visible to the public that the Treasury takes the risks (which it does, ultimately, anyway). It matters for comparisons with Switzerland that, as a legal person in common law, the Treasury can issue such indemnities under its common law powers. (By contrast, where the Treasury overrides someone's ordinary property rights to take a bank into temporary public ownership and so on, it must act under statutory powers granted by, and comply with any constraints set by, Parliament in legislation.) Thus, when indemnifying the Bank of England, the elected executive government does not need to issue an emergency ordinance of the kind used by the Swiss finance ministry to guarantee some of the SNB's LOLR assistance to CS.

The Discount Window Facility

The Bank operates a Discount Window and OMOs of various kinds. At the end of 2008, it moved to having both a dedicated overnight standing facility for

⁸⁵ <https://www.bankofengland.co.uk/markets/bank-of-england-market-operations-guide/our-tools>

⁸⁶ 2017 version, which I believe is the latest (and so as not updated for Brexit):

<https://www.bankofengland.co.uk/-/media/boe/files/memoranda-of-understanding/resolution-planning-and-financial-crisis-management.pdf>

payments glitches (the equivalent of the SNB's LSFF) and, separately, a Discount Window Facility (DWF) for LOLR assistance. Via the DWF it lends typically for up to 30 days, renewable at the Bank's discretion, against a wide population of collateral.⁸⁷ The interest rate charged increases with the riskiness of the collateral (which is categorised into three pools: A, B, and C, in increasing order of riskiness). Haircuts are set for more granular classes of collateral, and are published on the Bank's website. The Bank has discretion to change the haircuts at any time.

Foreign-currency denominated instruments are included in eligible collateral. An extra haircut is applied (and can be adjusted) to cover the foreign-exchange exposure to which the Bank would be exposed if, due to its counterparty defaulting, it had to realise the collateral.

The DWF is available on a continuous basis, and is designed to help mitigate the stigma problem. In its usual mode of operation, it involves a collateral swap, which avoids the visible effects of cash loans on the quantity of reserves in circulation and, so possibly, on the size of reserves-injecting (or draining) open market operations. Data on aggregate use of the DWF on average over a period of some months is published after a lag after the end of the reporting period.⁸⁸

Regular long-term indexed Repo OMOs against wide collateral

Regular OMOs are conducted against DWF-eligible collateral for a maturity of six months. Routinely, these are conducted, in a special way, together with auctions against a much narrower class of high-quality sterling collateral (roughly, gilts). The special feature is that participating banks each bid for a quantity of reserves across all collateral types but bid separately, and so at different interest rates, depending on whether they want to borrow against default-free or risky collateral.⁸⁹ At least in its aim, the pattern of bids can provide signals of incipient liquidity stress in the system, which can then

⁸⁷ Cash lending to clearing houses is specified as being for up to five days.

⁸⁸ Average aggregate daily loans over a calendar quarter is published five quarters later, on the first Tuesday following the final day of that quarter. Information on lending to specific counterparties is not published.

⁸⁹ For each collateral set, counterparties bid for an amount and offer to pay a spread above Bank Rate, so winning bids pay the clearing-price spread over the prevailing Bank Rate (hence, the name Indexed Long-Term Repos).

prompt the Bank to increase the amount of reserves offered via the wide-collateral repos (or in aggregate).

Contingent Term Repo Facility

The published system has, since 2014, made provision for another class of longish-term repos, of any maturity and size, as a codified contingency measure. This part of the permanent regime was introduced after the Bank no longer needed to maintain the Extended Collateral Term Repo (ECTR) facility it had introduced back in December 2011, as a temporary measure (during the euro area crisis), for lending against wider collateral than was then eligible in the indexed-repo OMOs. As such, it is equivalent to a standby version of the Term Auction Facility occasionally employed by the Fed (see above).

The Contingent Term Repo Facility's main feature seems to be that those auctions can be held at any time (so daily if necessary) and offer either limited or unlimited funds subject to the availability of collateral, which must be cleared with the Bank by close of business on the day before the operation. They are offered against all eligible classes of collateral (A-C). Public disclosure of use is decided each time the facility is activated, in the light of circumstances.

ELA, including the Resolution Funding Framework

ELA is what falls outside the Bank's regime. It could involve almost anything, subject to the solvency constraint, Treasury approval, and the availability (if requested) of government indemnities.

In 2017, the Bank published a document on its approach to resolution that included how it would approach the liquidity needs of a banking group in resolution. This included the possibility of the Bank lending via the standard facilities (above), but also that it might lend via new Resolution Liquidity Facility (RLF), which would involve approval, and possibly an indemnity, from the Treasury. The reason given for the RLF seems important:⁹⁰

⁹⁰ Box 2, "The Banks's approach to providing liquidity in resolution" in *The Bank of England's approach to resolution* (The Purple Book), October 2017, pp.22.

“Given the potential size of lending relative to the Bank’s resources, an indemnity is likely to be requested by the Bank in a range of scenarios. HMT would consider any request by the Bank for an indemnity on a case-by-case basis in the context of the resolution plan and need to use resolution tools. Any losses incurred by the Bank or HMT in connection with the provision of liquidity support via the Resolution Liquidity Framework would be recovered from industry in line with FSB guidance and requirements in the [relevant legislation].” (my emphasis)

The significance, it seems to me, is that the Bank of England is effectively recognising publicly that the liquidity needs of a successfully resolved group might be gigantic, a point hardly unique to Britain, and just as possible for a firm in open-bank conservatorship. This fits with my general argument (Part 2) that, for a sound bank, a LOLR needs to be ready to refinance the entirety of the short-term liabilities, and so acceptable collateral on that scale (after haircuts) needs to be available.

Eligible collateral: foreign loans and securitisations

In its liquidity-insurance facilities and operations, the Bank takes as collateral, among other instruments, both securitisations of loans and unsecuritised portfolios of loans, but with a crucial difference that might be relevant to Swiss deliberations.

For unsecuritised loan collateral, the loans can be denominated in some foreign currencies (US dollars and Euros, for example), but the loans must be governed by the laws of England and Wales (or of Scotland, or Northern Ireland).⁹¹ By contrast, where portfolios are securitised, the Bank accepts collateral where the underlying claims are loans in foreign jurisdictions governed by foreign law. Notable examples of the latter include European covered mortgage bonds, and U.S. asset-backed securities of certain mortgage loans, auto loans, and so on.

I am not aware of the Bank of England requiring, in its published conditions, that any securitisation (whether issued into the market or packaged in securitised form in order to be transferable to the Bank) must have a servicer

⁹¹ See page 22 of *Loan Collateral: guidance for participants in the Sterling Monetary Framework*, Bank of England, September 2020. <https://www.bankofengland.co.uk/-/media/boe/files/markets/eligible-collateral/loan-prepositioning-guide.pdf>

independent from the firm pre-positioning it. There is a question here about the management of debt collection in the event of a default on the LOLR loan.

Collateral pre-positioning

The Bank of England has a highly developed regime for pre-positioning, which it urges upon banks but does not formally require. The regime involves due diligence, legal sign offs, site visits, processes for withdrawing assets for use elsewhere, and a lot more.⁹² (I think the Swiss authorities might usefully study this, and the Fed equivalent.)

All banks are encouraged, by the Bank as central bank, and by the Prudential Regulation Authority, to pre-position. As I understand it, this applies not only to those banking entities regarded as very important to domestic (within-UK) financial intermediation but also to their UK-domiciled siblings that are not ring fenced. This is, perhaps, a very important contrast with the Swiss approach (up to now at least: see below).

The EU's European Central Bank

The European Central Bank is an institution of the EU, operating under the terms of the Treaty on the Functioning of the European Union (which, via the Lisbon treaty, incorporates the Maastricht treaty that established the monetary union). Its writ runs mainly through those EU member states that have joined the monetary union (20 out of 27 at present).

The ECB's own liquidity facilities operate, as part of its monetary policy operations, under the control of the ECB's Governing Council, with profits and losses pooled and shared out according to a "capital key."

Vitaly important here, ELA for individual banks is handled by national authorities of the members of the monetary union, subject to not violating treaty bars on state aid (administered by the EU Commission) and monetary financing. Where extended by national central banks, ELA must also comply with various ECB regulations.

⁹² See, for example, *Loan Collateral*, *ibid.*

That ECB regime, which is periodically updated, includes a bar on any NCB ELA interfering with the Eurosystem's formal objectives, a codified version of the solvency constraint discussed in Part 2, and requirements for reporting to Frankfurt to let the Governing Council track what is going on (for some things, *ex post*).⁹³

Within those parameters, NCBs have considerable freedom to adopt their own approach to ELA, including collateral, with any losses falling locally (i.e., they are not pooled).

The liquidity facilities operated by ECB

The ECB's primary mode of providing liquidity to the banking system as a whole is via short-term and longer-term OMOs, conducted against a fairly wide class of collateral. Although serving the primary purpose of steering short-term interest rates via the (net) supply of reserves, in effect these operations also provide liquidity to individual bank counterparties. The ECB also offers an overnight facility for smoothing frictions in overnight money markets --- again for monetary policy but also providing a 24-hour lifeline.

The same set of collateral is eligible in all of the ECB's regular operations and facilities (including intra-day lending to oil the payments system). In those regular credit operations, the Eurosystem accepts as collateral certain marketable assets issued by non-EU issuers (e.g., Canadian covered bonds denominated in euros). For loans and other credit claims, however, the debtor needs be established in a member state whose currency is the euro. In the specific case of ABS taken as collateral, the issuing special purpose vehicle must be established in the European Economic Area, which includes non-euro-area jurisdictions, and the obligors and creditors of cash-flow generating assets have to be incorporated or resident in the EEA.

During crises, the ECB has sometimes temporarily extended the maturity of its lending, and has also occasionally widened the population of eligible collateral. The latter has included lowering ratings thresholds (e.g., during the Irish crisis in 2011), and accepting broader classes of foreign currency-denominated securities.

⁹³ "Agreement on emergency liquidity assistance," ECB, 9 November 2020.
www.ecb.europa.eu/pub/pdf/other/ecb.agreementemergencyliquidityassistance202012~ba7c45c170.en.pdf

The European System of Central Banks and pre-positioning

The ECB does not require its regular counterparties to pre-position eligible collateral, but some counterparties do in practice post some unencumbered ECB-eligible collateral with their local national central bank if they do not use those assets as collateral in private-market transactions.

I understand that some banks may pre-position such non-marketable instruments even if they are not regularly used in the ECB's refinancing operations. Perhaps that is because they can be used in the interest-free intra-day credit facility. But such posting of unencumbered eligible collateral might also be useful in the event of ELA from the NCB.

National Central Bank ELA

I am not aware of NCBs publishing the parameters of their individual approaches to ELA (collateral, contingency planning, pre-positioning, testing and so on). In that respect, the EA system is not unlike the pre-CS Swiss arrangements, other than the need to comply with EU law on state aid and ECB regulations (see above).

The former means that, except where a waiver is granted by the EU Commission, the NCBs cannot use ELA as a disguised (equity) support operation. The latter means that, in principle, the ECB could veto any instance of ELA that materially undermined monetary policy or other Eurosystem objectives, and can track its evolution. It also means the ECB is, in principle, capable of comparing and contrasting ELA policies and practices across those NCBs that have conducted ELA.

Overall, I am left feeling that the ECB's regular credit operations are very important for liquidity insurance.

EU resolution funding

In the EU, the Single Resolution Board, created and operating under Directive (the EU equivalent of national primary legislation), may use the Single

Resolution Fund (SRF) to provide resolution funding. But, as in the US, “funding” is a misleading term because the SRF may be used to absorb losses or inject equity, which is about capital support not absorbing a run. There might, therefore, exist a gap in the EA framework.⁹⁴

Switzerland

Compared with the other jurisdictions, this section on Switzerland says a little more about the regulatory regime as it seems relevant to LOLR planning and preparation.

Supervision, deposit insurance, and resolution

In Switzerland, banking operations are authorised and supervised by FINMA. The statutory criteria for authorisation, which I understand to apply continuously, include (in English translation from FINMA's website):⁹⁵

- guarantee of irreproachable business activity by qualified participants and members of ultimate strategic and executive management
- effective risk management – in particular appropriate identification, limitation and monitoring of market, credit, default, settlement, liquidity, image, operational and legal risks."

Where the criteria for authorisation are no longer satisfied, FINMA has powers, subject to the normal constraints of public law, to revoke authorisation or, probably more relevant in the context of any systemic firms, to place conditions on the operation of the business.

Where a firm or group is designated as systemic, those of its activities deemed systemically important are subject to special emergency-planning requirements (see below under SNB). The scope of this part of the regime is, I conjecture, important to the effectiveness of LOLR/ELA in Switzerland.

⁹⁴ This was the thesis of Maria Demertzis, Ines Goncalves Raposo, Pia Huttli and Guntram Wolf, “How to provide liquidity to banks after resolution in Europe’s banking union,” *Policy Contribution Issue 21*, Breugel, November 2018. A similar point was made later in Grund et al (2020), *ibid*.

⁹⁵ <https://www.finma.ch/en/authorisation/banks-and-securities-firms/getting-licensed/banks/>

For a firm in serious difficulty, FINMA has powers to require a firm to execute a recovery plan, or to put it into resolution. The resolution regime, operated by FINMA, includes all of purchase & assumption, bridge banks, and bailin (see Part 2 main text).

Switzerland has a deposit-insurance scheme. It is not funded (meaning surviving banks bear the costs of insurance pay outs). Nor is there a resolution fund.

Since an emergency ordinance was passed in 2023, Switzerland has had a Public Liquidity Backstop, under which the finance ministry can issue guarantees to back SNB lending. A law was tabled on 6 September to put it on a permanent footing. It was first floated, in 2022, as a mechanism to enable the SNB to lend into resolutions.

The Swiss National Bank

The Swiss National Bank publishes a document on its constitution, mandate(s), activities and finances, the latest version of which came out on 27 July 2023.⁹⁶ It summarises the SNB's role in financial stability as including "the task of contributing to the stability of the financial system" (a responsibility conferred by legislation), formally designating significant banks as systemic, overseeing Switzerland's financial market infrastructure, exclusive rights to make formal recommendations to the Federal Council (i.e., the executive branch of government) on the use of macro-prudential instruments (most of which are not held by SNB itself), and LOLR (page 31).

SNB as LOLR: eligibility and collateral

The SNB is empowered to act as LOLR to banks *and* (my emphasis) other financial institutions by Article 9.1.e of the Swiss National Bank Act (NBA). Nothing is prescribed or proscribed in the Act except that relevant credit transactions shall be sufficiently collateralised. Thus, the provision applies to all its lending, not LOLR in particular. There is no provision in primary legislation specifically on ELA, or even on LOLR more broadly.

⁹⁶ <https://www.snb.ch/en/mmr/reference/kurzportraet/source/kurzportraet.en.pdf>

Until recently (see below), the SNB had said very little in public about how it approached the exercise of this power, other than via a few paragraphs in a published document on its monetary operations.⁹⁷ These said that ELA was available only to *domestic* banks that were systemic,⁹⁸ and against collateral that SNB determines is sufficient. A few things are interesting about this, including that, as a matter of statutory law, the SNB is not constrained to confine LOLR/ELA to banks, nor to domestic banks, nor to banks that are systemic. Something like the restriction to systemic businesses might, arguably, be implied by the SNB's statutory responsibility to "contribute to the stability of the financial system" (NBA, Art.5.2.e). But I am not convinced of that because the failure of lots of small banks at much the same time can prove systemic in its effects, and because doubts about the availability of LOLR help to middling banks or banks without important domestic functions can leave the financial system as a whole more fragile than otherwise (see Parts 1 and 2).

The SNB publishes the broad classes of instrument that are eligible in its repo operations (2004/23 *Guidelines* section 3, which impliedly applies to its overnight facility; see below). The list includes a wide range of securities, including some securitisations of foreign loans (e.g. European covered bonds). It does not publish a list of collateral for ELA, but it is widely thought that it has mainly comprised portfolios of Swiss mortgage loans. I amplify on this below.

The SNB has an overnight facility for handling payments glitches that might impede the operation of monetary policy: the Liquidity-Shortage Financing Facility (LSFF). The amount that can be drawn overnight from the LSFF is 110% of a limit set by SNB, and may be amended subject to a ten-day notice period (*Guidelines*, section 2.2, para 2). Without knowing the full details of this, I am not sure how sensible the limit-system is because, unless the limits are extraordinarily high, it might have the effect of pushing a bank or banks into ELA just because of some gigantic payments-system malfunction, terrorist attack or natural disaster. I do not pick this up in the main text.

⁹⁷ See section 6 (p.6) of Guidelines of the Swiss National Bank on monetary policy instruments, of 25 March 2004 (as at 5 May 2023):

https://www.snb.ch/en/mmr/reference/snb_legal_geldpol_instr/source/snb_legal_geldpol_instr.en.pdf

⁹⁸ The language used in the English version is that "the bank or group of banks seeking credit must be of importance for the stability of the financial system." It is not entirely clear (to me) whether this is identical to being part of a group formally designated as systemic, but I think so because the more recent document (see below) says "ELA is available to all systemically important banks." Nevertheless, as a matter of law, the SNB is not restricted by statute to systemic banks and so it is conceivable that these words mean something different from a bank/group being formally designated as systemic (see main text).

The SNB does not have a Discount Window-type facility, lying between the LSFF and ELA, for borrowing against wider classes of collateral in order to absorb lasting liquidity strains. Nor does it routinely conduct auctions (OMOs) against wider classes of collateral, or include such auctions as part of published contingency measures. The Bank of England was in the same position until late-2008. The SNB's limited array of facilities is striking given the evolution of policy and practices during and since the GFC at the other three central banks covered here.

The system for designating firms as systemic, and its bearing on LOLR planning

Since there are no regular LOLR facilities and ELA seems to have been restricted, at least in the past, to firms regarded as systemically important, it matters --- at least to LOLR planning and preparation --- how the systemic-designation system works.

Under statutory law, such designations are made by the SNB (Swiss Banking Law, Section V, Art. 8). Technically, the law does not restrict ELA to firms/groups designated as systemic. Even though the SNB stated in the past that it provided ELA only to systemically important firms, that did not need (as a matter of law) to mean being formally designated as systemic. Further, as I understand it, the SNB had discretion as to what it regarded as systemically important in the particular circumstances, and a broader discretion to drop or amend that eligibility test (including by amending the published *Guidelines*). Nevertheless, the regime for formally designating a group as systemic has a very important feature that I suspect matters ---possibly greatly --- to LOLR planning and operational preparations, at least up to now.

Under the statutory scheme, after consulting FINMA, the SNB designates both systemically important banks and also, significantly, those of their functions or activities that it judges to be systemically important (Article 8.3 of the Swiss Banking Law). Functions are deemed by the statute (Art. 8.1) to be systemic "if they are *indispensable to the Swiss economy* and cannot be substituted at short notice" (my emphasis, because it is not obvious that wealth management or investment banking activities pass a test of indispensability).⁹⁹ The text goes on to single out "domestic deposit and lending business, and payment transactions." As a matter of the proper interpretation and application of the

⁹⁹ Using the published KPMG translation of the law: [here](#)

law, it is not clear to me whether that leaves SNB with lawful discretion to designate other functions as systemic. Possibly so.

In any case, in practice the functions/activities designated by SNB as systemically important functions have been the *domestic* deposit and lending activities, as well as payment transactions.

The entire banking group is designated as systemically important and, as such, is subject to the Swiss TBTF requirements (capital, liquidity, resolution planning, and so on). Once a bank/ group and some of its activities are designated as systemic, FINMA, after consulting the SNB, issues regulations outlining the special requirements that must be met. As part of its recovery and resolution planning, the systemically important bank must satisfy FINMA that it can maintain its systemically important functions in the event of imminent insolvency (known as a Swiss Emergency Plan). If the bank is not able to demonstrate that, FINMA *shall* order the necessary measures (Art. 10.2; note the imperative).

This set up bears a family resemblance with the UK regime for ring fencing the largest domestic retail banks from the rest of the group of which each is a part. A significant difference, it seems to me, however, is that in many such cases the Bank of England regards the rest of the group as systemically significant too, and so, as I understand it, applies (or can apply) its collateral pre-positioning policy to the international banking entities based in the UK. (Certainly it should do so, and I have not seen anything to suggest it does not.)

Recent changes to SNB's approach to LOLR assistance

During August 2023, SNB made important refinements to its public description of Switzerland's LOLR regime.¹⁰⁰ Two are mentioned in Part 4 but are set out in a little more detail here.

First, in its August 2023 publication, SNB said that it “is expanding its possibilities for providing liquidity to the whole banking sector. This initiative started in 2019. Following the launch of a pilot phase, the whole banking sector was duly informed in July 2023” (which I note is after the CS collapse

¹⁰⁰[https://www.snb.ch/en/ifor/media/dossiers/id/media_dossiers_lolr#:~:text=As%20lender%20of%20last%20resort%20\(LoLR\)%2C%20the%20SNB%20can,the%20framework%20of%20its%20mandate.](https://www.snb.ch/en/ifor/media/dossiers/id/media_dossiers_lolr#:~:text=As%20lender%20of%20last%20resort%20(LoLR)%2C%20the%20SNB%20can,the%20framework%20of%20its%20mandate.)

and rescue). For domestic banks, it is suggested any ELA would mainly be against “illiquid mortgage collateral.”

Second, the document says, “The universe of eligible collateral is reviewed by the SNB on an ongoing basis and developed in dialogue with the banks.” It goes on, “The SNB cannot directly accept foreign loans due to their high local legal and realisation risks. However, the SNB does accept foreign loans if they are in the form of asset-backed securities (ABS) and the said legal problems have been resolved as part of the securitisation process. When assuming loans directly, other central banks also focus on loans within their own jurisdiction.” The last point is true of vast jurisdictions like the US and EA, but not, so far as I can see, of the UK, at least so long as loans are packaged into securitized form (above). It is not clear to me whether SNB would in principle take bespoke securitisations not issued into the market.

Next, very sensibly, the SNB emphasises all that needs careful preparatory steps, observing, “These consist, in particular, of creating the contractual requirements, ensuring the legal and operational transferability of the collateral, as well as regularly testing the processes with the SNB and other service providers involved.”

And, finally, it makes the important point-cum-plea that “it does not have the power to instruct banks to take the necessary preparatory action. The SNB is convinced that good preparation for crisis situations is in the interest of the whole banking system.” This is addressed in the main text of this report.

As discussed in the main text, putting all that together with the description of the systemic-designation regime, it seems to me plausible that ELA planning and concrete preparations for entities within the CS group that were not held to house domestically vital functions began too late.

ANNEX B: MORE ON PRE-POSITIONING ENOUGH COLLATERAL TO COVER ALL SHORT-TERM LIABILITIES

At a high level, perhaps the biggest question for central bankers (and their political overseers) is whether, as suppliers of liquidity insurance, they want to make short-term liabilities informationally insensitive by requiring monetary

intermediaries to hold reserves or eligible collateral against all runnable liabilities.

The cleanest and clearest way of doing that would be to require banks to cover all (100%) of their short-term liabilities with reserves or collateral pre-positioned with the central bank.¹⁰¹

Under such a scheme, industry lobbying (and associated political pressure) would be directed at the definition of “short-term liabilities” (e.g., out to what maturity, and how to treat committed credit lines), the population of instruments eligible at the Window, and the level of haircuts set by central banks.

Haircut policy, important to any LOLR regime, would be absolutely central to banking policy under this approach because the excess collateral requirements could not be funded by still more short-term debt. Instead, common equity and longer-term debt would have to fund the excess collateral required by central banks to cover short-term liabilities plus, also, any assets that were not eligible at the Window.

Capital markets businesses

Even if regular banks were required to pre-position collateral covering all their core banking business’s short-term liabilities, they could build a levered capital-markets book on top of it. Just like the so-called Liability Driven Insurance vehicles that unravelled in London in late 2022, this would involve borrowing long term, using the proceeds to buy long-term government securities, repoing out those bonds short term, and buying illiquid, risky assets with the proceeds of the repos.¹⁰² The liquidity-reinsurance constraint on that

¹⁰¹ An idea of this kind was first floated in the Bank of England as a temporary expedient when, before the Great Financial Crisis, we were thinking about contingency plans for a 9/11-type disaster, which might have required us to narrow the corridor between the overnight deposit and lending facilities to zero. A permanent version was advocated by Mervyn King in *End of Alchemy* (chapter 7, pp. 269-281). My version, setting out more details and pointing out that liquidity insurance does not overcome fundamental insolvency, was in Tucker (2019). This annex adds more detail.

¹⁰² Obviously, this can be repeated any number of times. In the second round, the risky assets themselves would be loaned out to generate more funds, to be invested in even more risky assets, and so on. The ongoing constraint would be the collateral required by repo market counterparties. The sudden stop constraint would be those counterparties declining to roll over maturing repos, or demanding extra collateral the bank could not deliver. I address only the simple case here.

cannot be quite the same as on the core business because those government bonds are already pledged to the private-market repo counterparties; they are encumbered, meaning the bank cannot use them to borrow from the central bank.

Cutting through the mechanics, I suggest the policy should be roughly as follows. In the first place, the levered risky-asset portfolio could be pre-positioned with the central bank. Further, in case the private-market government bond repos cannot be rolled over, the bank should also pre-position with the central bank eligible assets covering the difference between the market haircut on the government bond repo (h) and the central bank's own haircut on government bond repo (H , assuming H is greater than h). This guarantees that if the government bond portfolio ends up needing to be refinanced with the central bank, the flailing bank can meet the higher haircut requirement.

The indispensability of resolution (and conservatorship) regimes

It is easy to fall into thinking that 100%-covered liquidity insurance renders insolvency irrelevant. In fact, such a regime would leave uninsured short-term liabilities safe only when a bank was sound (in the sense of fundamental solvency described in the main text). Resolution regimes remain essential for when that condition does not hold. Similarly, some kind of conservatorship regime remains essential for when a bank is not fundamentally insolvent but, perhaps because of a reputational crisis, is doomed to be so if it remains under the control of its management and board.