

Principles, circumstances and constraints: the Nationalbank as lender of last resort from 1816 to 1931

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In this study, we provide a discussion of the role the Austrian central bank played as a lender of last resort (LLR) during selected episodes of financial distress from the Nationalbank's foundation in 1816 until the Creditanstalt crisis of 1931. Based on our evidence, we argue that free lending as advocated by British economist Walter Bagehot was historically the exception rather than the rule in Austria, and that no clear evolution toward more "free lending" is observable over time. The panic of 1912, a particularly fascinating example of a "forgotten" crisis that has never been investigated in detail, serves as our benchmark because the Nationalbank's crisis management during this specific episode comes very close to an effective case of free lending. Instances of credit rationing during other financial crises seem to have emerged as a consequence of public doubts about the value-storing capacity of banknotes and due to a lack of discountable or pledgeable assets resulting from the Nationalbank's regulations and/or risk management framework. Our study echoes earlier literature in the field, underlining the importance of the microeconomics of last resort lending, including the incentive structure of lending programs and the ex ante supervision of counterparties.

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Why have central banks' responses to financial crises differed so much over time? One explanation might simply be endogenous learning: policymakers draw lessons from mistakes committed in the past and adapt crisis management accordingly. Undoubtedly, economic (history) research on the Great Depression of the 1930s has informed monetary policy reactions to the recent financial turmoil of 2008 (Almunia et al., 2010; Eichengreen, 2015). However, a focus on lessons from history neglects the fact that the rationale and impact of central banks' responses to crises have always been deeply contested, both by contemporaries and

academics, ever since Henry Thornton's 1802 treatise on *The Paper Credit of Great Britain* (Thornton, 1802). In its simplest specification, this theoretical and empirical discussion turns around the conditions and circumstances under which central banks should provide an extra liquidity injection into the financial system for the benefit of all banks under circumstances of a collective financial market liquidity crisis.²

Walter Bagehot is famously taken to have answered this question in the following way: Central banks should lend freely, at high interest rates, and only in return for good collateral.³ The myriad rationalizations of Bagehot's principles

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² Rather than representing emergency liquidity assistance (ELA) to individual banks, the historical concept of last resort lending was thought of as a form of support extended to the financial system as a whole. See Goodhart (1999).

³ These principles are generally derived from various passages in Bagehot's major work. See Bagehot (1873).

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gave rise to many myths and misunderstandings about the lender of last resort (LLR) by diverting attention from the historical context in which these functions first emerged.⁴ In this study, we aim at retracing these roots in a particular national setting, thereby adding Austria to the existing international literature on LLRs, which is almost exclusively dominated by studies on the U.S.A. and the U.K.⁵ We analyze the Nationalbank's behavior in the context of six crises – 1820, 1848–49, 1873, 1912, 1923–24, and 1931. Our selection encompasses both well-known and less well-known episodes of financial distress, but does not represent a comprehensive list; rather, it reflects our attempt to capture the manifold faces and aspects of LLR activities throughout history. While the crisis of 1820 constitutes the first financial panic following the foundation of the *privilegierte oesterreichische National-Bank* in 1816, the crash of 1931 in turn stands out as a natural endpoint: it represents the last crisis before financial repression in the aftermath of World War II (WW II) led to the complete disappearance of banking crises in all industrial countries until the 1970s.

Based on our evidence, we argue that in Austria, free lending was historically the exception rather than the rule. The reason was not that the Nationalbank did not care for financial stability; rather, its policy was constrained by a range of factors, including regulation, limits to information and confidence in the Nationalbank itself. The remainder of this study is structured as follows: We first briefly review the LLR litera-

ture to advance our take on Bagehot's principles. Section 2 provides a brief sketch of the monetary policy framework of the Nationalbank during the period under study. Section 3 then describes the “forgotten” panic of 1912, which we argue to be a benchmark case of Bagehot-style free lending. Section 4 looks at why free lending, which worked so successfully in 1912, was not adopted during most other financial crises. Section 5 concludes.

1 The central bank as lender of last resort

Financial crises have generated an extensive literature in both economics and economic history (Allen et al., 2009). While the proximate and ultimate causes of the fragility leading to a financial crisis may differ and continue to be debated, all financial crises share some commonalities that are most relevant for the question of last resort lending (Gorton, 2012). These shall be briefly outlined here.

1.1 The logic of financial crises

Market economies depend on the use as transaction media of short-term debt obligations issued by financial intermediaries. These obligations can take many forms. Normally, we think of deposits here but historically, banks have also issued private notes or, more recently, shares in money market funds or repos. These instruments have in common that their exchange requires little or no information on the issuer or the underlying collateral; in normal times, they are information insensitive.⁶ Banking crises are characterized

⁴ See Goodhart (1999) and Bignon et al. (2012) for a more in-depth discussion of these fault lines.

⁵ Some international perspectives are provided in Kindleberger and Aliber (2011). For in-depth studies of individual countries, see e.g. Buyst and Maes (2008) on 19th-century Belgium, and Bignon et al. (2012) on France.

⁶ Information-insensitive assets are safe assets in the sense that they are accepted as collateral without fear of adverse selection and can store value over time. See Gorton and Ordoñez (2014) and Gorton (2016).

by a flight out of these debt obligations and into cash. They are systemic events in the sense that they involve many or most financial intermediaries (Gorton, 2012).

Runs constitute a rational response to shocks that cause creditors to doubt the ability of financial institutions to honor their debt contracts. These shocks may be very small in nature and might even be expected to happen only in the future. Yet, it suffices that they are strong enough to induce creditors to question the quality of their claims, thereby turning previously information-insensitive into information-sensitive assets. When uncertainty about asset values increases, the debt capacity of collateral – the amount of secured borrowing that can be sustained by an asset – can fall dramatically (Acharya et al., 2012). Creditors will be inclined to ration their funds by converting their debt into safer and more liquid assets or by increasing the haircuts on short-term collateralized debt. If shocks effectively trigger the production of information about the quality of underlying assets, debt backed by collateral that is revealed to be bad may be called in outright (Gorton and Ordoñez, 2014). Whether newly available information about collateral quality sparks a systemic run rather than being merely translated into increasing margins eventually depends on a variety of additional factors, such as the scale of the information production, the length of the preceding credit boom and the economic as well legal microstructure of short-term secured funding markets (Martin et al., 2014).

Systemic financial crises can take different forms. The most emblematic example is a depositor run, when savers physically queue in front of their banks

to withdraw cash. However, panics may also affect wholesale funding, as during the recent financial crisis of 2008 (Gorton and Metrick, 2012). Ultimately, panics might even target the liabilities issued by the central bank itself, normally the most liquid and safe asset available, when people start to doubt the future value of banknotes and strive to exchange banknotes into real or foreign assets. Despite the different appearance of panics, the consequences are similar. In a systemic run, the affected intermediaries are by definition unable to fully meet the large-scale scramble for cash they are facing. In this sense, all intermediaries become insolvent, as they cannot honor their obligations without trying to sell assets (Gorton, 2012). If many credit institutions sell their assets simultaneously, however, fire sales will result, as asset values are depressed by “cash-in-the-market pricing.”⁷ The resulting price declines can have severe macroeconomic consequences and may affect parts of the banking sector, other third parties and, more globally, the real economy, all of which had not been related to the initial run (Antinolfi et al., 2015; Brunnermeier et al., 2009).

These negative externalities provide the rationale for a LLR that can provide the financial system with unlimited cash in exchange for the liabilities targeted by the run. In doing so, the LLR can address creditors’ doubts, stop the incipient run and avert fire sales that would have potentially severe macroeconomic consequences (Oehmke, 2014). In fact, the mere setup of LLR might prevent the panic altogether. To be able to fulfill its task, the LLR must be an institution that is in a position to issue an unlimited (or at least a very large)

⁷ “Cash-in-the-market pricing” occurs when the total liquidity available in the market at a specific moment in time is (much) smaller than the total value of assets offered for sale. See Allen and Gale (2007).

amount of cash, in other words, an institution that cannot become illiquid itself. Historically, in the absence of central banks, associations of large banks have served as LLRs (see e.g. Gorton, 2012). Another candidate is the government, which has the advantage of being able to tax. As monopoly issuers of currency, however, central banks are in the most natural position to act as LLRs.

1.2 Bagehot's principles

What exactly is the LLR's task? On the surface, each financial crisis looks new and different. It involves new financial products and possibly new agents.⁸ At the same time, the basic mechanism underlying crises is always the same – the flight out of debt into cash – and hence allows for the development of some general guidelines. The most famous guidelines come from Bagehot's book *Lombard Street* (Bagehot, 1873) and were condensed by later authors into three principles, namely that central banks should lend freely (i.e. without limits), at high interest rates and only in return for good collateral.⁹

Debates on the significance and meaning of these three “rules” continue today. Yet they can serve as a useful framework for organizing the following discussion of the Nationalbank's policy during financial crises, particularly so as Bagehot's work is grounded in the practice of 19th-century central banking. Bagehot's “free lending” principle is best read as a plea against credit rationing by the central bank. To halt bank runs, the LLR needs to propagate “the impression that though money may

be dear, still money is to be had” (Bagehot, 1873). Bignon et al. (2012) propose a simple test for the absence of credit rationing. Under the null hypothesis of free lending, the central bank's “interest rate (for any given quality) ought to always be above, or equal to, the market rate (for the same quality)” (Bignon et al., 2012). The market rate can only be higher than the policy rate in the presence of credit rationing; under free lending, an initially higher market rate would decrease immediately due to funding liquidity arbitrage.

Naturally, this test immediately raises the question of how high the quality level of the paper is to which the policy rate applies. If this quality level is set very high, credit rationing might effectively result from counterparties' shortage of eligible collateral. The crucial question is then which assets the central bank perceives as “good collateral.” Bagehot (1873) himself defined “good collateral” as financial paper which “in ordinary times is reckoned a good security” and is “commonly pledged and easily convertible.” In ordinary times, however, central banks may have many reasons to limit the type or quality of assets admissible for their credit operations. Broader lists of eligible securities (in the case of lombard loans) or less stringent criteria in discounting will be associated with heightened credit risk or at the very least will increase operational expenses. As a result of these restrictive practices ex ante, counterparties may become short of eligible assets when a crisis occurs, thus preventing the central bank from providing the required liquidity ex post (Bindseil,

⁸ As historical experience shows (most recently the panic of 2008), crises are bound to happen in those areas of the financial system that are not regulated or guaranteed, which is probably also the main reason why deposit insurance, an alternative means to keeping up confidence in bank liabilities, is not sufficient. In Austria, deposit insurance was only introduced in 1979, and is thus of no relevance for the period under study.

⁹ As already pointed out above, these principles never appear as such but are generally derived from various passages in Bagehot (1873).

2014). No matter how this tradeoff is solved in the concrete case, free lending requires that the LLR at least does not tighten eligibility criteria (for discounts) and/or reduce the pool of eligible securities (for lombard loans) in response to financial distress. Inertia should prevail in accepting bills and assets that are considered “good collateral” in normal times (Bindseil, 2014).

While the logic of “free lending” and “good collateral” is relatively straightforward, the concept of “high rates” has been found to be more difficult to rationalize. One standard interpretation relates to moral hazard. High rates provide an incentive for banks to engage in proper liquidity risk management in normal times. However, this rationalization has been challenged along several lines. On the one hand, high interest rates might just encourage failed institutions to gamble for survival. On the other hand, recent theoretical work shows that moral hazard might be less of an issue as long as informational asymmetries on counterparty risk and/or collateral quality between borrowers and the central bank are not large (Martin, 2006; Castiglionesse and Wagner, 2012; Naqvi, 2015). In fact, central banks have never stayed at arm’s length from their borrowers, not in the past and much less today. The intensification of counterparty management and banking supervision is indeed strongly correlated with central banks’ assumption of LLR responsibilities. For example, Flandreau and Ugolini (2014) point to the crucial importance of continuous ex ante monitoring of counterparties for the success of last resort lending in England after the 1866 Overend crisis.

Contributing to this debate, Martin (2009) and Bignon et al. (2012) have proposed two alternative rationales for “high rates.” According to Martin

(2009), Bagehot mainly cared about the efficient use of limited central bank reserves in the context of a commodity money regime. Although the Bank of England’s requirement to abide by predefined cover requirements was usually suspended in case of a financial panic, the credibility of the Bank of England critically hinged on prudent management of available reserves. Too large an expansion of the money supply over and above the statutory limit, risked triggering a currency crisis. High rates thus served to efficiently allocate limited reserves among the counterparties that needed them most. The argument advanced by Bignon et al. (2012) is more akin to the current justification of negative interest rates on central bank deposits. It rests on the observation that during banking panics, financial intermediaries search for a safe haven (central bank deposits), which curtails the supply of funds on the money market. In the extreme case, the central bank would internalize the entire money market, lending to banks in need of funds while taking in deposits from banks with surplus funds. In addition to straining the limited reserves of the central bank as discussed above, such an approach would mean that intermediaries also forgo the use of their private knowledge on counterparties as well as collateral and stop collecting information, which might hamper the functioning of the market in the long run. With interest rates on central bank deposits always at zero in the 19th century, the main lever to encourage banks to transact with each other is an increase in the discount rate, which, in Bagehot’s words, will “operate as a heavy fine on unreasonable timidity, and will prevent the greatest number of applications by persons who do not require it” (Bagehot, 1873, p. 197).

2 The operational framework of the Nationalbank

To analyze how a central bank provides liquidity during a crisis, it is useful to understand the design of its normal-time operational framework first. Here, the central bank's standing facilities play an important role. Standing facilities are those operations whose general lending conditions (most importantly the eligibility of assets and the applicable interest rate) are defined by the central bank, while actual operations are initiated by the central bank's counterparties, not the central bank itself. By design, standing facilities can accommodate sudden increases in liquidity demand without requiring the central bank to take any explicit measure. The only prerequisites are that the central bank does not restrict access to the standing facility during a crisis and that the facility does not suffer from a stigma, meaning that counterparties feel it is safe to access the facility if they need it (Bindseil, 2014).

In Austria, liquidity-providing operations were long dominated by discounts and advances, as was the case for most other central banks in the 19th and first half of the 20th century.¹⁰ Both types of operations were organized as standing facilities in principle, where rules and conditions were fixed in advance and made publicly known. The Nationalbank operated both facilities from its foundation in 1816 and kept the following basic features unchanged throughout the period under study:

In an *advance*, the Nationalbank granted a loan against some pledged

collateral, typically securities, at a set interest rate, the so-called lombard rate. The conditions were straightforward. Loans had a maximum maturity of three months. The maximum amount of the loan was calculated as the market price of the pledged securities minus a haircut. If the price of the collateralized securities dropped below a specified threshold during the term, the debtors had to provide additional collateral or repay the loan. The list of eligible securities and haircuts was published.¹¹ At the outset, it included only government bonds, but it was extended over time to encompass a wide range of subsovereign, railroad and covered bonds as well as shares of selected railroads and shipping companies.¹² Haircuts were set at relatively high levels compared to today, mostly at 25% or 30% of the market value.

In *discount operations*, on the other hand, the Nationalbank bought a bill of exchange with a short initial or remaining maturity at a discount to its nominal value (the discount rate).¹³ In the period under study, access to discounting was not limited to financial intermediaries: the Nationalbank would accept bills for discounting from "any man, regardless of social standing, if he is known to the Nationalbank as law-abiding."¹⁴ Access was, however, restricted geographically, as the Nationalbank had to cash the bill at maturity and could therefore only accept bills payable at locations at which it had an office. Until 1841, when the first Nationalbank branch office was opened in Prague, only bills payable in Vienna were eligible for

¹⁰ On Austria, see Jobst and Kernbauer (2016). For an international comparison, see Jobst and Ugolini (2016).

¹¹ This disclosure policy is in contrast to the Bank of England's, where such information was not made public (Flandreau and Ugolini, 2014).

¹² For lists of eligible central bank collateral, see *Compass* (1868–1919).

¹³ In principle, the Nationalbank also discounted treasury bills and short-dated securities like coupons, but their importance was negligible in practice.

¹⁴ Article 65 of the *Reglement* (a supplement to the Nationalbank's statutes), see Pressburger (1959a).

discounting. In the following decades, the geographical scope of eligibility was widened significantly, as the Nationalbank opened additional branch offices throughout the entire Habsburg monarchy. Unlike payment modalities for advances, where the Nationalbank could resort to selling the collateral posted in the case of nonpayment, the reimbursement of a bill depended on the ability of the acceptor or the drawer to pay at maturity. Assessing the quality of the signatures featured on a bill was thus essential. To be eligible for discount, a bill as a rule had to be signed by three, but in any case by at least two, “persons known to be solvent.” The quality of a bill was established in two stages. First, the Nationalbank drew up lists of persons and companies who were deemed eligible in principle and defined a maximum amount up to which the counterparty could access the Nationalbank directly (by submitting a bill for discount) or indirectly (by figuring as an acceptor on a bill submitted by a third counterparty).¹⁵ The required information was collected by the Nationalbank’s local branch offices. Each branch hosted a standing discount committee composed of bank officials as well as local businessmen and dignitaries. Based on public and private information, these committees regularly revised the individual credit limits (Kövé, 2015). Second, the discount committee examined and checked each bill presented for discounting against the formal submission criteria.

While the Nationalbank made these conditions public and while in principle anybody who fulfilled the criteria could apply for a discount or an advance, the Nationalbank’s statutes and regulations left some scope for discretion. In particular, they allowed the Nationalbank

to refuse an operation, e.g. the granting of an advance or the discounting of paper, without giving reasons. Thus, whether the Nationalbank effectively pursued a policy of free lending or not cannot be judged on the rules set down in the operational framework alone. Rather, the question is an empirical one that we will discuss in the sections that follow.

3 A textbook case of free lending: The “forgotten” panic of 1912

In the following section, we use the panic of 1912 as our benchmark case. Apart from our finding that the Nationalbank’s crisis management during this specific episode comes very close to an effective case of free lending, the panic of 1912 constitutes a particularly enticing case as a “forgotten” crisis that is mentioned in historiography but that has never been investigated in detail (Michel, 1976; Pressburger, 1973).

The banking panic that gripped Austria in November 1912 has to be seen in the context of the political tensions following the defeat of the Ottoman Empire in the First Balkan War (October 1912 to May 1913). The probability of a military involvement of Austria-Hungary peaked in the last two months of 1912 when Serbia’s ambitions to annex Albanian territory met with heavy opposition from the Habsburg empire and culminated in mutual threats of war. The tensions only eased when the Treaty of London was concluded in early 1913. The imminent danger of an armed conflict in fall 1912 served as an exogenous shock to Austro-Hungarian depositors with financial intermediaries in the border regions with Serbia (Carniola, Croatia-Slavonia, Dalmatia, the Austrian Littoral and Southern Hungary) and Serbia’s

¹⁵ In addition, the Nationalbank operated with aggregate limits at the branch level.

major ally, Russia (Galicia, Bukovina). The preference for liquidity increased, fears were rife that the government might confiscate savings deposits in the case of war, and uncertainty arose about (local) asset values in the event of a hostile assault or an occupation. Bank creditors started to panic and withdrew a significant fraction of their sight liabilities from credit institutions and converted them into cash (chart 1). From early October, when the first runs started, to the end of December 1912, banknotes in circulation increased from 2.4 billion crowns to 2.8 billion crowns, or by some 15%.¹⁶ At the same time, interbank credit was drying up, as large correspondent banks in the core cities, which themselves faced tight conditions in money markets,

turned increasingly cautious.¹⁷ The business model of savings banks was particularly prone to maturity mismatches, as such banks financed long-term mortgages with sight deposits. Hence, the banks targeted by runs found it difficult to obtain funding and risked illiquidity-induced defaults.

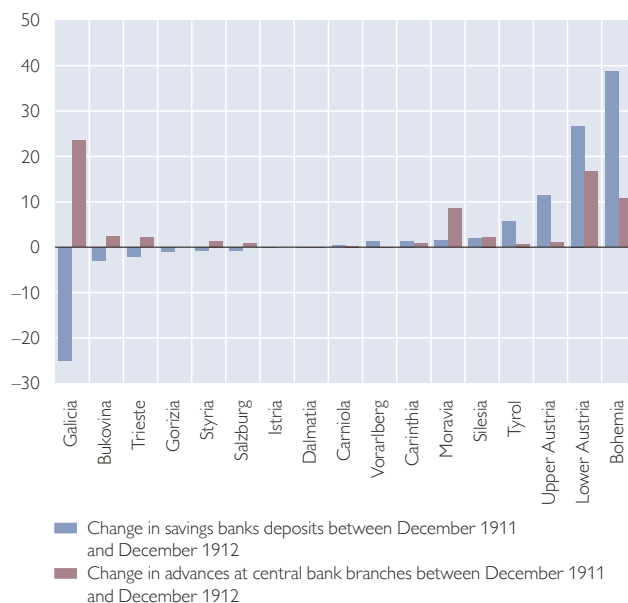
The Austro-Hungarian Bank (*Oesterreichisch-ungarische Bank*) reacted by letting its standing facilities operate freely and distributing liquidity generously. There are no signs that the bank restricted access to its discount window. Over the entire year 1912, the bank rejected only some 63,000 bills for formal or other reasons out of a total of 4.6 million bills or, put differently, accepted 98.6% of all bills submitted for discounting. This percentage was

Chart 1

The forgotten panic of 1912

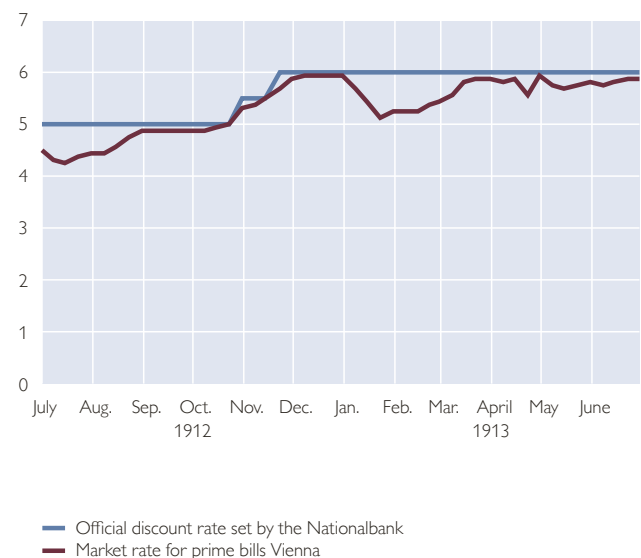
Change in savings bank deposits and central bank advances

Million crowns



No credit rationing

%



Source: OeNB (1913a), k. k. Statistische Zentralkommission (1915), Neue Freie Presse (1864–1939).

¹⁶ December typically also marked a seasonal peak in currency circulation. Still, the increase relative to the previous year topped out at 305 million crowns on December 23 and amounted to 275 million crowns on December 31, 1912.

¹⁷ E.g. Prague banks withdrew credit lines from Galicia. See OeNB (1912b, November 19).

somewhat lower than in 1911, when 99.1% of bills were accepted, but above the average rate of 97.6% that was observed in the first five years of the 1900s. Moreover, the hypothesis of free lending is also supported by the Nationalbank's handling of individual discount limits during the crisis. When these limits became binding for a number of credit institutions in late 1912, the bank relaxed the limits without much debate or delay. Typically, it was the local branch office that provisionally raised the limit, while the directorate in Vienna sanctioned the decisions only *ex post*.¹⁸ In addition to, and independently of, individual increases, a circular allowed all counterparties to exceed their discount limits subject to the posting of eligible securities as additional collateral.¹⁹

The ultimate quantitative evidence in favor of free lending is provided by the behavior of open market discount rates: they increased toward the bank rate but never exceeded it. Unlimited access to central bank refinancing at the official rate prevented the market rate from rising above the official rate.²⁰ As the Austro-Hungarian Bank accommodated the high demand for liquidity, its overall lending portfolio ballooned, mirroring the geographical pattern of bank distress (both chart 1). The wide definition of eligible collateral for lombard operations already before the crisis was helpful, as it lowered the probability that counterparties would run out of eligible assets. While in Vienna and Budapest, posted collateral consisted mainly of government bonds (1911: 87%, 1912: 76% of total collateral),

financial intermediaries in the affected regions borrowed extensively on the security of covered bank bonds (1911: 27%, 1912: 41%).

Besides free lending, the policy of the Austro-Hungarian Bank contained a second important aspect, namely its effort to revive the interbank market. During the autumn of 1912, the Nationalbank raised its policy rates twice, citing as reasons not only capital outflows in the face of interest hikes by the Bank of England, the Banque de France and the German Reichsbank but also the need to increase the opportunity costs of idle cash and to create incentives for intermediaries to relend in the markets, as the Nationalbank's secretary general underlined: "The tensions remain and almost no transactions are completed on the open market. The implementation of exceptional measures is justified to combat these conditions, which have been ongoing for some time now and which need to be considered critical" (OeNB, 1912c).

A final, but crucial aspect of bank policy was the management of moral hazard. In principle, the origin of the crisis – a clearly external event unrelated to pre-crisis policies of financial intermediaries – limited moral hazard to begin with. However, different banks' financial situation very likely differed in terms of their volume of liquid reserves: Banks with higher reserves were more resilient to withstanding a run *ex ante*. Indiscriminate free lending during the run could thus mean endorsing risky liquidity management strategies *ex post* and could encourage imprudent behavior in the

¹⁸ For increases in individual limits, see OeNB (1912b, 1913b).

¹⁹ See OeNB (1912a). Of course, banks could have used these securities for advances instead, but haircuts would have been higher. Employing securities as collateral for discounts could thus be advantageous.

²⁰ The "market rate" referred to is the average open market short-term discount rate for prime bills. It was calculated and reported daily in the official stock market report of the Vienna stock exchange.

future. The tool to address moral hazard was the monitoring scheme the Nationalbank had available through its credit lists and discount committees. While the bank lent generously during the crisis, it made clear that help was temporary. Increases in discount limits were typically granted for three months only. Whereas the Nationalbank stood ready to prolong the extraordinary credit lines if need be, which it did when some of them came up for renewal in January 1913, counterparties were nevertheless under pressure to scale down central bank borrowing as quickly as possible. Evidence from the meetings of directors in Vienna suggests that the Nationalbank fine-tuned its pressure depending on whether it perceived a counterparty's position as fundamentally sound or not, relying on information obtained from discounting as well as the regular reassessments of credit limits. An extreme, yet telling case is that of *Ústřední banka českých spořitelén* in Prague, which had been founded as the central institution for Czech savings banks in 1903. The bank had apparently overstretched its risk management capacities following a large business expansion into Galicia and Bukovina. In September 1912, i.e. before the start of the run, the Austro-Hungarian Bank already turned down a request by *Ústřední banka* for an increase in its credit limit. Rather than raising the limit when the crisis hit in October, in November the directors even argued that *Ústřední banka's* credit limits should be lowered. But they acknowledged that in the face of the ongoing run, such an approach would "lead to a catastrophe," putting *Ústřední banka's* customers at risk.²¹ Instead, the Austro-Hungarian Bank continued to

lend based on the quality of the paper submitted, focusing mainly on the quality of the other signatures on the bills, as the signing parties would have had to step in if ever *Ústřední banka* failed to pay. At the same time, future access to central bank refinancing was made conditional on changes in *Ústřední banka's* business model. The directors' strategy seems to have worked, as it was able to lower the *Ústřední banka's* credit limit by December. In February 1913, the minutes report that the management of *Ústřední banka* had been changed and that a program to restructure the bank was already on its way.²²

To conclude, the way the Austro-Hungarian Bank managed the panic of 1912 appears to be a clean example of Bagehotian lending of last resort. By lending freely, the Nationalbank prevented a regional banking crisis from escalating into a general market liquidity crisis. The adherence to the "free lending" principle finds itself unambiguously reflected in the fact that market rates never rose above the official rate. Last but not least, the Nationalbank's intimate knowledge of its counterparties allowed it to forestall any risk of moral hazard by forcing its borrowers to adjust their business models if they wanted to preserve their access to central bank refinancing in the future.

4 Free lending – the exception rather than the rule

We now turn to an analysis of the Nationalbank's behavior during other financial panics. All of these crises involved some sort of flight to safety that had the potential to create a price spiral and depress the market price of a broad range of assets. In this sense, they would have all justified the intervention of a

²¹ OeNB (1912b, November 19 and December 3).

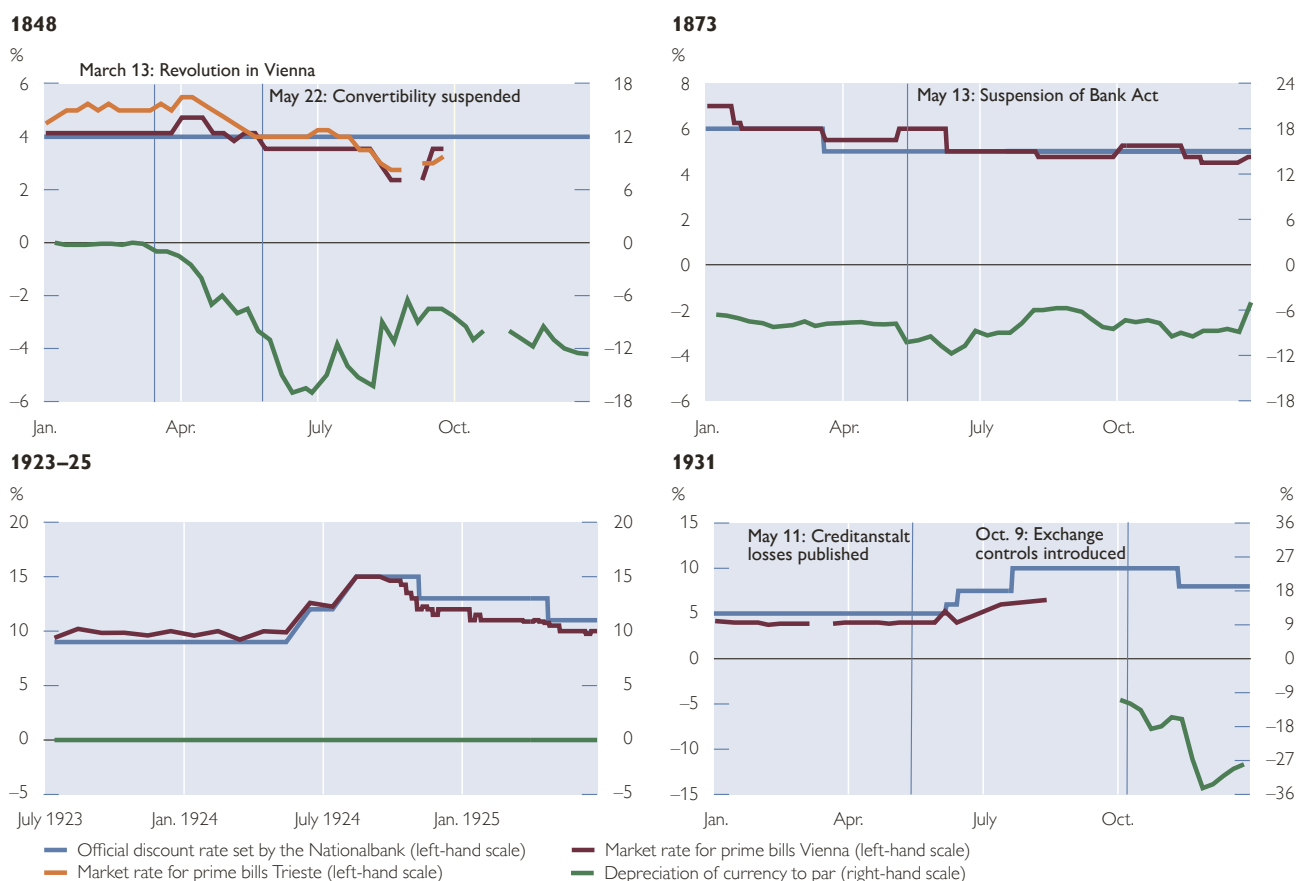
²² OeNB (1913b, February 4), *Compass (1868–1919, volume 1914)*.

LLR. For some of these crises, quantitative evidence on restrictions and rationing in central bank lending is available in the form of the spread between market and official rates as reported for 1912 in chart 1 above. Chart 2, which displays market and official rates for the crises of 1848, 1873, 1924–25 and 1931, shows that in contrast to 1912, credit rationing is obvious in three of these four episodes – sometimes even

before the outbreak of the crises.²³ This observation raises the question why the Nationalbank did not abide by the free lending principle, even though rationing conveys a very negative signal, undermines confidence in the markets and exerts a potentially severe impact on financial stability as well as the loan supply to the real economy.²⁴ In the following section, we argue that external constraints, but also self-imposed inter-

Chart 2

Bank and market rates during four financial crises



Source: Official rates: Lucam (1876), OeNB (1923–1938); market rates: *Journal des Oesterreichischen Lloyd* (1836–1849), *Der Tresor* (1872–1918), OeNB (1923–1938), *Österreichisches Institut für Konjunkturforschung* (1927–1938); depreciation from par: authors' calculations based on silver prices and exchange rates in *Wiener Börse* (1786–1858), *Wiener Börse* (1861–1875) and OeNB (1923–1938).

Note: Market rates refer to three-month open market discount rates for prime bills. For 1848, direct evidence is only available for Trieste; rates for Vienna refer to implicit interest rates derived from the price of bills with different maturities payable in Vienna as traded in Trieste.

²³ Unfortunately, an analogous comparison for 1820 is not possible because market rates are not available for this early period.

²⁴ Friedman and Schwartz (1963) already criticized the Federal Reserve for only faintheartedly supporting banks that suffered panic runs during the Great Depression. For more recent research on the financial stability implications of rationing policies, see Richardson and Troost (2009).

nal constraints partly prevented the Nationalbank from lending freely, and we look at some institutional innovations used to circumvent these obstacles.

4.1 The confidence constraint: convertibility, statutory limits on note issuance and the value-storing capacity of central bank money

As pointed out above, a LLR must be capable of issuing unlimited amounts of cash to prevent bank runs or to calm incipient runs. Although central banks cannot become illiquid, the privilege to issue more legal tender does not always constitute a sufficient basis for acting as an effective LLR. Indeed, banknotes – the cash liabilities issued by the central bank – must themselves be accepted as a liquid and safe means of payment. If, on top of a run on banks engendering outflows of liquid reserves from the banking system, a run on the central bank occurs because the public loses its confidence in the value of banknotes and the central bank is compelled to convert large quantities of cash into specie (or foreign exchange), the central bank's ability to calm a panic by issuing currency is severely curtailed. Historically, the only way out of a dual run was the suspension of note convertibility into specie or the introduction of foreign exchange controls. While halting the banking panic, these measures necessarily triggered sharp depreciations of the currency.

The crisis of 1848 constitutes a prime example of the confidence constraint. The financial repercussions of the revolutionary uprisings which hit the Austrian Empire in 1848 were twofold (Pressburger, 1959a). On the one hand, banks and merchants situ-

ated in areas affected by escalating tensions between the imperial army and revolutionary groups began to experience increasing funding difficulties. On the other, the revolts fueled a political confidence crisis that induced a run on the central bank's exchange offices, as people suspected that Chancellor Metternich's struggling authoritarian regime would ultimately take recourse to debt monetization to pay for rising military expenditures. Fearful that paper money would lose its purchasing power, the public drained specie reserves from the Nationalbank's vaults.

Following the logic in Martin (2009), raising official rates might have slowed this process, but the Nationalbank's Governing Board unanimously rejected an increase in the discount rate as largely ineffective during a time characterized by civil warfare (Pressburger, 1959a). Moreover, the Nationalbank could not count on the government, which itself was considerably weakened by the ongoing revolts, to acquiesce to the imposition of deflationary pressures on the economy, nor was the government in a position to help out the Nationalbank with its own silver reserves. In these critical circumstances, the Nationalbank apparently rationed credit to gain time while desperately trying to find an alternative to end the depletion of its reserves. By May 1848, the Nationalbank had run out of options. Following some marginal restrictions on the convertibility of its notes, it asked the government for permission to suspend convertibility on May 20, 1848. Only the forced exchange of paper money, which was declared two days later, freed the Nationalbank from the necessity to impose rationing and led to downward pressure on market rates as the Nationalbank re-expanded

lending.²⁵ At the same time, the value of the florin (fl.) dropped dramatically (chart 2).

1848 was not the only instance when the confidence constraint became binding. There is evidence that the Nationalbank found it challenging to lend freely during financial crises even when convertibility was suspended, which was the case during the entire second half of the 19th century until the introduction of a “shadow” gold standard in the late 1890s. To increase and maintain the public’s confidence in the value-storing capacity of banknotes, from the 1850s onward, the government imposed statutory rules governing the cover of banknotes by precious metals. The flipside of these rules was that they limited the Nationalbank’s capacity to expand lending in the case of a financial crisis.

The new regime was first tested during the *Gründerkrach* stock market crash in 1873. At this time, the Nationalbank was operating a system modeled on the British Peel’s Act; it limited the amount of banknotes to fl. 200 million without silver coverage, while every florin issued beyond the fl. 200 million ceiling had to be covered by reserves in specie.²⁶ The *Gründerkrach* followed a pronounced financial boom between 1867 and 1873 that saw a sharp increase in joint stock banks in operation. Most new banks engaged in investment banking. To raise the attractiveness of their initial public offerings (IPOs), the banks generously lent against shares in the form of repos. These schemes allowed investors in the stock exchange to accumulate high leverage, as they needed very little own capital to buy

into an IPO. As soon as doubts about the profitability of the newly founded companies surfaced in April 1873, stock prices reverted, forcing banks to place margin calls with their deeply illiquid and partly insolvent borrowers. Borrowers defaulted on their repo loans from banks while depositors suddenly began to withdraw their funds from banks in May 1873.²⁷

In an almost immediate reaction to the stock market crash on May 9, 1873, the Austrian and Hungarian governments jointly agreed to suspend the Nationalbank’s reserve requirement on May 13 in order to decouple the central bank’s credit supply from any formal reserve rule. Yet, despite the legal possibility to lend freely, the Nationalbank’s policy response to the crisis stayed very tentative. The cover ratio was effectively overshoot in only 18 out of the 74 weeks of suspension, which was upheld until October 1874. Furthermore, the amount by which the statutory limit of note issuance was exceeded remained negligible throughout. The all-time high of excess supply amounted to fl. 28.5 million and was reached on November 11, 1873 (Lucam, 1876), which has to be compared to an aggregate equity base of the banking system of fl. 575 million. Apparently, the Nationalbank refused to lend on eligible collateral, as the rates paid on prime bills in Vienna repeatedly exceeded official rates by up to 100 basis points even after the suspension of cover requirements (chart 2).

The most striking feature of the period following May 13, 1873, is the seemingly contradictory presence of a strong skepticism of the Nationalbank

²⁵ After having gradually fallen over the first months of 1848, the circulation of banknotes rapidly increased following the suspension of convertibility. See Jobst and Kernbauer (2016).

²⁶ All relevant legal texts are reproduced in Pressburger (1959a, 1959b).

²⁷ For a more detailed discussion of these dynamics, see Rieder (2016).

and the state vis-à-vis free lending, in spite of the suspension of the 1863 Bank Act by the government itself. Recurring references and discussions in the minutes of the Nationalbank's Governing Board meetings suggest that its policy decisions were haunted by the fear that the cover ratio could soon be fully reinstated. The Governing Board argued that any too sudden reinstatement could catch the Nationalbank on the wrong foot, if it were to overextend credit during the episode of suspension and could lead to the loss of the Nationalbank's note-issuing privilege. At the same time, it is hard to believe that this threat needed to be taken seriously, given that the government had itself taken the initiative to suspend the Bank Act. Rather, the Nationalbank's cautiousness seems to have reflected a general consensus on the importance of rules to guard the stability of the currency. The credibility of the Nationalbank's commitment to the stability of the florin had suffered significantly in 1866 when the government had issued significant amounts of government paper money to finance the war against Prussia.²⁸ As the convertibility of the florin into silver had been suspended since then, adherence to the statutory cover requirements remained the only formal safeguard in place for the value of the Austrian currency. Lifting the cover requirements thus represented a potentially far-reaching intervention that put the public's confidence in the florin to a test. This also seems to have been the position of the government, which, when it informed the Nationalbank about the temporary suspension on May 13, 1873, advised it not to abuse its newly gained freedom.²⁹ When

writing an account of Nationalbank policy during the period from 1861 to 1875, its secretary general prided himself on the fact that the Nationalbank had behaved as if convertibility had been in place (Lucam, 1876). Unsurprisingly, the maybe overly strict interpretation of this approach led to mass failures of around 40% of all Austrian joint stock banks. However, in stark contrast to the wild gyrations of the exchange rate on the various occasions of economic and political turmoil since 1848, the florin's silver value remained remarkably stable from 1872 onward throughout the entire crisis period.

When the Nationalbank's statutes were renewed in 1888, the numerical ceiling on the central bank's note issuance was maintained, but was also amended to allow for temporary transgressions of the fl. 200 million limit as long as the bank kept a proportional cover ratio of at least 40% and paid a compensatory tax on the excess issue to the state (Jobst and Kernbauer, 2016). This alteration introduced a rule-based flexibility into the Nationalbank's policy framework that was known to the public ex ante and that fundamentally alleviated the tradeoffs the Nationalbank had faced in 1873. This setting certainly facilitated the swift and encompassing policy response to the crisis of 1912 described above, as the Nationalbank made very extensive use of the flexibility granted by the introduction of the compensatory tax. At end-1912, the sum of taxable banknotes in circulation was by far the highest since the institution of the rule in 1888 (Pressburger, 1973). Undoubtedly, the room for maneuver conceded by the statutes of 1888 represents a key

²⁸ See Jobst and Stix as well as Prammer et al. (2016).

²⁹ Memorandum to the Governing Board signed by Finance Minister de Pretis on May 13, 1873, as cited in Pressburger (1959b).

reason for the Nationalbank not to engage in credit rationing during the turmoil of 1912.

The handling of the crises in 1848, 1873 and 1912 highlights the importance of the modalities and details woven into the framework of monetary policy. Only a very specific combination of tools and constraints enabled the central bank to walk the delicate tightrope between free lending on the one hand and maintaining public confidence in the value-storing capacity of its most important liabilities, Austrian banknotes. Nevertheless, it is worth noting that the above cases could convey the false impression of a linear evolution of the Nationalbank's LLR role, an assumption that looking at later crises cannot substantiate. Following hyperinflation and the stabilization of the Austrian currency in 1922, the new statutes of the re-established *Oesterreichische Nationalbank (OeNB)* in 1923 lifted the absolute limit on the issuance of banknotes, reduced the proportional cover ratio further and even allowed for transgressions of the proportional cover ratio as long as the central bank paid a compensatory tax in return (Kernbauer, 1991). Convertibility of banknotes was still suspended, and, as previously, the OeNB was charged with the task of preempting a depreciation of the currency until the resumption of specie payments. Yet, despite the fact that the operational environment of 1912 had been transformed to include even more flexibility on paper, free lending was again absent during the so-called "franc crisis" of 1924 (chart 2). The OeNB advanced liquidity to the market, but it could not fully satisfy demand without risking a violation of the gold standard orthodoxy imposed by the League of Nations, under whose tutelage both the government and the OeNB had operated since the early

1920s. While the OeNB tried to postpone interest rate increases, it was not in a position to expand its lending too much without attracting heavy criticism from the League's finance committee and the Bank of England (Kernbauer, 1991). From a purely technical perspective, the OeNB could have implemented a "free lending" policy while maintaining the low level of interest rates and thus could have pushed down market rates. However, full allotment at low interest rate levels would have induced a significant increase in the circulation of banknotes at a time when renewed inflation and exchange rate volatility constituted the most pressing concerns of Austria's international creditors.

In another deviation from the linear trend, the twin crisis that erupted in the aftermath of the near-failure of *Creditanstalt* in May 1931 again triggered public doubts about the OeNB's ability to defend the Austrian schilling's fixed exchange rate (Schubert, 1991; Stiefel, 1989). Unfortunately, a lack of comparable market rates makes it impossible to evaluate whether and to what extent mistrust in the value of the Austrian currency curtailed the OeNB's free lending capacity following the *Creditanstalt* crisis in 1931. Yet, the measures taken suggest that the OeNB faced a drastically deteriorating situation. The OeNB engaged in unsuccessful attempts to reduce central bank borrowing by hiking interest rates, and, equally in vain, tried to replenish its reserves via loans from the Bank of International Settlements (BIS). Only the combination of a complete government guarantee for national and international creditors' funds at *Creditanstalt*, on top of an additional state guarantee on the bills (to be) discounted by the OeNB in conjunction with the introduction of capital controls, proved

enough to halt the run on the *Creditanstalt*. The price to be paid was the loss of a significant part of foreign exchange reserves and the reintroduction of exchange controls in October 1931. Together, the crises of 1924 and 1931 thus suggest that additional dimensions beyond the scope of the present study, such as the prevailing political forces and ideas, as well as the (international) creditor structure, equally shape the LLR's room for maneuver.

4.2 Lack of eligible assets and possible remedies

Successful free lending requires that the counterparties in need of liquidity have sufficient assets at hand that can be sold to the central bank or pledged in collateralized borrowing. In principle, assets should suffice as long as the central bank stands ready to value them at their pre-panic prices. In the 19th century setting, bills of exchange did not pose any complications, as they were always valued at 100 minus a deduction for the discount rate. In the case of securities used in lombard lending, central banks could simply use the pre-panic prices to avoid procyclical tightening of credit.

In practice, however, the situation in Austria was more complex for several reasons. First, the Nationalbank was bound by its statutes and regulations. In its collateralized lending operations, the bank's regulations combined mark-to-market pricing (like in the Eurosystem today) with significant haircuts. The Nationalbank's first crisis management experience in 1820 is particularly informative: The 1820 crisis erupted in the context of the long-run recovery of Austrian bond prices in the aftermath

of the Napoleonic wars. In September 1820, a (temporary) sharp decline in the price of government debt put a number of highly leveraged Viennese bankers into difficulties.³⁰ Part of the leverage had been financed through lombard lending by the Nationalbank, which now faced a double challenge. On the one hand, the decline in market prices obliged it to make margin calls, which the counterparties could not fulfill. According to its regulations, non-payment allowed the Nationalbank to liquidate the collateral, which, however, would have precipitated a further decline in the market price, ultimately resulting in a loss to the Nationalbank when selling (OeNB, 1820, July 14). As a result, the Nationalbank had to tweak its own rules and suspended margin calls.³¹ While this measure allowed it to keep the level of pre-crisis lending, it did not answer the need of some troubled houses for additional funding. Now the high haircuts, a useful risk management tool *ex ante*, proved problematic, as borrowing from the Nationalbank at 75% of market value meant that counterparties could not use the remaining 25% as collateral for borrowing e.g. from other banks. Ultimately, the constraint was circumvented by the intermediation of a committee of other Viennese bankers as well as a government guarantee (OeNB, 1820, September 28). The episode nevertheless underlines the constraints imposed by haircuts and mark-to-market pricing for collateralized lending in a situation of falling market prices.

The Nationalbank was also subject to stringent regulations on discount lending, as mentioned in section 2 above. For a long time, counterparties in dis-

³⁰ In 1820, the circle of Austrian bankers consisted exclusively of private banking houses. The first joint stock banks emerged only in the 1850s. OeNB (1820, October 5).

³¹ OeNB (1820, September 21 and October 5).

count operations had to reside in Vienna or a city equipped with a Nationalbank branch office. In addition, all bills discounted had to be payable in such cities. These constraints together excluded a significant number of agents and bills of exchange from central bank refinancing.³² With the extension of the Nationalbank's branch network after the 1850s, these territorial restrictions gradually lost importance. However, they appear to have had implications during the turmoil of 1848. Lacking branches in the provinces, the Nationalbank was initially unable to influence local credit conditions in 1848. The constant positive spread of the market rate on prime bills in Trieste over the corresponding costs in Vienna (chart 2) suggests that liquidity in the provinces was available only in return for the payment of a hefty premium that could in fact exceed 150 basis points, even in a financial center like Trieste.

Even if the Nationalbank had suspended its rules and had accepted bills payable outside a branch city in 1848, the extension of eligibility would have met with a second set of constraints, namely the interrelated issues of information and risk management. Lending to new agents required knowledge of their quality, i.e. of whether bills would have constituted "good collateral" before the onset of the crisis. As evidenced by the sophisticated infrastructure for counterparty screening described in section 2, such information was costly and time-consuming to obtain. Furthermore, the need to manage risk appropriately also limited the extension of additional facilities to existing counterparties that could have stood in as intermediaries between ineligible counterparties and the central bank. As de-

scribed in section 2, the Nationalbank worked with individual credit lines, which it increased at its discretion only in cases of acute need.

To circumvent these different restrictions, the Nationalbank ultimately used several ad hoc tools and options, most of which only partly addressed credit rationing and, moreover, entailed a transgression of its statutes or sometimes best practice risk management.

Most interesting in this respect is that the Nationalbank repeatedly resorted to a more systematic alternative response by setting up support committees (*Aushilfs-Comités*). These committees were usually formed by representatives of several leading banks in Vienna, but also of firms outside the banking system. They joined forces to buy bills not admissible at the central bank's discount window and agreed to lend against collateral outside the central bank's eligibility circle. The Nationalbank in turn contributed to financing the operations of these support committees either directly by discounting otherwise ineligible bills once the committee members had jointly guaranteed them, or indirectly by agreeing to generously discount bills presented by the allied credit institutions. The degree of institutionalization of these committees varied from time to time, as did the duration of their existence and hence the extent of the Nationalbank's involvement. In 1820, for example, the committee constituted only an ad hoc association of 12 private banking houses that mutually guaranteed their liabilities to gain access to the discount window for the purpose of supporting their ailing peers (OeNB, 1820, September 21). The Vienna *Aushilfs-Comité* of 1873, in contrast, represented

³² See Jobst and Kernbauer (2016). For a similar argument made in the context of the Banque de France, see Bignon and Jobst (2016).

a longer-lasting and more sophisticated organization. It published a full-scale business program and sourced a permanent equity fund drawn up by Austro-Hungarian firms and private businesspeople. The Nationalbank even pledged fl.1 million, representing one-eighth of total equity, to cover potential losses resulting from lending activities (Compass, 1868–1919).

By construction, the *Aushilfs-Comités* served several purposes. First, they minimized the central bank's counterparty risk because the participants had given a mutual guarantee; at the same time, they put the central bank into a position to channel credit to borrowers with potentially above-average risk using collateral beyond its statutory requirements. Moreover, by leaving the business of rating submitted bills and collateral to the guaranteeing members, the Nationalbank appeared to have found a clever way to access private information and to shift some of the additional risk management costs back to the market.³³ Finally, the committees might also have helped coordinate important market players in preventing fire sales and might thereby have addressed one of the most consequential collective action problems associated with banking panics.

5 Conclusions

The failure of *Creditanstalt* in 1931 became notorious beyond Austrian borders. Other episodes of banking distress in Austria, with the possible exception of the crisis of 1873, are less well known or are internationally

unknown. By providing a first systematic treatment of banking panics that hit Austria during the 19th and the first half of the 20th century as well as of the respective policies the Austrian central bank adopted, this contribution has added several observations to the international literature on financial crises and has enlarged the pool of experience to draw from.

The analysis focused on episodes where LLR policies addressed the market, more precisely, the entirety of the central bank's eligible discount and lombard counterparties. Occasionally, however, the Nationalbank designed, or participated in, schemes addressing individual troubled institutions that did not qualify for the Nationalbank's standard crisis operations because they did not have a sufficient amount of eligible assets. Typically, such special treatment was rationalized by the extraordinary importance of the respective institution. Today, such institutions would be called systemically important financial institutions (SIFIs). Austrian history features several such cases, most notably *Bodencreditanstalt* in 1873 and again in 1929 as well as *Biedermannbank*, *Centralbank der Deutschen Sparkassen* and *Postsparkasse* (Postal Savings Bank) in the mid-1920s.³⁴ Finally, support for *Creditanstalt* in 1931 also belongs in this category. However, the economic (and of course also political) logic of lifeboats and bailouts is distinct from the LLR operations described here and requires very detailed evidence on each particular case as well as separate treatment.

³³ The definition of "cost-covering fees for the valuation and risk management of less liquid assets that are submitted to the central bank as collateral" is at the center of recent discussions on how to reduce overreliance on central bank lending. See Bindseil (2014).

³⁴ On *Bodencreditanstalt*, see the ongoing dissertational work of Kilian Rieder. On the interwar bailouts, see Ausch (1968), Stiefel (1989) and Kernbauer (1991).

Four observations about the LLR operations considered here are in order:

First, while crisis episodes exhibit recurring patterns of policy responses, no clear evolution can be discerned.³⁵ Although the Nationalbank was set up as a private joint stock company in 1816, several indicators signal that it operated in a broader interest from the outset. This pursuit of a more general interest is evident e.g. in 1820, when the directors evoked the responsibility of their “national institution” to halt the crisis, or in 1854, when help for a provincial savings bank was justified by potential contagion effects on other savings banks.³⁶ A likely explanation for the early inclusion of financial stability in the Nationalbank’s objective function may be that it never operated as a narrowly profit-oriented and competitive corporation but was instead run in the joint interest of a coalition of the most important Vienna banking houses and the government from the beginning.

Second, our analysis has shown that cases of free lending were rare. Contrary to Bagehot’s prescriptions, the central bank typically rationed credit, notably in 1848 and 1873, and probably also in 1820 and 1924. As argued above, the reason was not that the Nationalbank did not recognize its responsibility for the stability of the financial system. Rather, its policies reached the limits imposed by first, its statutes, which forbade some types of operations or set a maximum for the amount of resources available for lending; second, a lack of information, which would have made lending excessively risky; or third and most dramatically, a lack of public con-

fidence in the liabilities issued by the Nationalbank itself. However, rather than announcing defeat, the Nationalbank produced a number of institutional innovations designed to circumvent some of these limitations: so-called *Aushilfs-Comités*, associations of private agents partly funded by the central bank, played the most prominent role from 1820 onward. They appear to have addressed several concerns, allowing the central bank to draw on private funds and to collect information on counterparty and collateral quality; they also helped to align incentives and coordinate market agents in order to prevent fire sales. As pervasive as they were, they have hardly been analyzed in the literature. Their rationale, functioning as well as the extent of their success (or failure) would be a worthy subject for further research, in particular as evidence on similar instruments in other countries is relatively scarce.³⁷

Third, our reading of Austrian banking crises underlines the importance of the microeconomics of last-resort lending, hereby echoing the arguments made by Flandreau and Ugolini (2014) for the case of the Bank of England. The Nationalbank scrutinized both the nature of submitted bills and collateral as well as all available information on individual borrowers. The accumulation of information worked not only to limit the central bank’s risk exposure but also to reduce moral hazard and to provide incentives to limit dependency on central bank lending. Equally of interest is the definition of securities eligible for lombard lending before and during a crisis. Here again, our know-

³⁵ Unlike argued e.g. in Capie et al. (1994).

³⁶ OeNB (1820, September 21), OeNB (1854). *On the instances of support to savings banks in Bratislava and Košice*, see Jobst (2014).

³⁷ Some 19th-century central banks used similar arrangements when creating a provincial branch network. See Ugolini (2012) for the case of Belgium.

ledge of historic central bank practices is limited, the only regularly cited evidence being Bank of England's Governor John Horsley Palmer's testimony that, in 1825, the Bank of England had lent "against all sorts of securities without much inquiry as to their nature."³⁸ The evidence on Austrian banking crises suggests a different picture; in Austria the definition of eligible collateral was extensively debated by the Governing Board of the Nationalbank. Akin to the question of individual lending ceilings, the delimitation of eligible collateral is a crucial microeconomic aspect of central bank lending that has significant consequences for the effectiveness of crisis policy and the extent of moral hazard it produces *ex post*.

Lastly, one question could not be treated here, namely what feedback central bank policies have on the occurrence of banking distress. Unlike the U.S.A. with its frequent banking panics or France and the U.K., which saw failures or at least the rescues of potentially systemically important institutions, Austria did not witness any

financial crisis during the 40 years following the 1873 crash, as the panic of 1912 prominently featured in this article is in fact an example of a crisis successfully averted. Given central banks' desire to avoid financial crises, it is these periods of calm that may contain the most interesting lessons for today.

The controversies that accompanied central bank actions worldwide during recent financial crises *inter alia* led to a significant curtailing of the Federal Reserve's possibilities to support individual institutions in the 2010 Dodd-Frank Act, showing that the debate on the need for and the optimal design of LLRs is well and alive. At the core of the current debate are questions of systemic stability, the too-big-to-fail concept, the cost of bank rescues and the options for bail-ins as well as the likely negative consequences of banks expecting a government bail-out in the future. Authorities in the 19th as well as early 20th century already faced many of these issues. Their creative solutions offer potentially important insights for today's policymakers.

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³⁸ Reported as quoted in Wood (1939).

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