THE CAUSES OF THE AUSTRIAN CRISIS OF 1931

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Abstract

The existing literature holds that the 1931 crisis in Austria can be traced back to banks' foreign currency exposure and their expensive mission to sustain their domestic and regional industrial connections after WWI. The former created exchange rate risks, the latter liquidity and maturity risks for Austrian banks. Relying on a rich macroeconomic dataset and a large bank-by-bank database for the whole Austrian financial system – both manually built from contemporary statistical sources – I propose that financial institutions' foreign currency mismatch was not severe and was hence not a cause to or a trigger of the 1931 crisis, and, at least before 1929, industrial networks were liquidity-suppliers to Austrian banks, rather than liquidity absorbers. The Austrian financial system collapsed in 1931 because this source of liquidity gradually dried up from 1929 as the economic downturn undermined the country's industrial base. The fact that banks were not forced to write off non-performing assets points to collusion between authorities and financial institutions.

Introduction

The debacle of Austria's largest bank, the Credit-Anstalt was a global turning point in the Great Depression. In the months following the announcement of the bank's losses in May 1931, besides Austria, several other countries in Central Europe and beyond experienced financial distress. These events, in turn, proved to be a watershed in terms of exchange rate policy: a series of devaluations followed in some countries, while others introduced capital controls (Obstfeld 1997). The gold exchange standard began to disintegrate, the international flow of goods and capital was hindered by emerging trade blocs, and what was previously a global recession deepened into a prolonged depression (Eichengreen 1992).

The historiography holds that the vulnerability of the Credit-Anstalt was the result of three factors. First, the bank's ambition to hold on to its "Konzern", i.e. its close industrial connections, and hence maintain its universal bank character (Teichova and Cottrell 1983, Schubert 1991, Stiefel 2008, Weber 1991a, Mosser and Teichova 1991) was detrimental to its liquidity because the Konzern tied up the bank's capital.[1] Second, the bank was dedicated to sustaining its Konzern not only within Austria's new borders but throughout the successor states of the Austro-Hungarian Monarchy (Stiefel 1983, Weber 2008, Hertz 1933, Schubert 1991, Eigner 1997a, Weber 1991b). The pursuit of regional ambitions reinforced the bank's low liquidity and weak profitability. Third, to mitigate its limited liquidity and support its regional expansion, the bank excessively exposed itself to short-term foreign capital which contributed to exchange rate risk and maturity risk (Eichengreen 1992, Kindleberger 1986, Cottrell 1983, Teichova 1994, Fior 2006). When in 1931 the Credit-Anstalt announced its financial difficulties, foreign creditors (Eichengreen 1992) or domestic deposit holders (Schubert 1991) started a run on the bank.

The purpose of this paper is to revisit the arguments of the historiography regarding the causes of the Austrian crisis in 1931. The existing literature does not utilize the available data that allow us to properly evaluate these arguments, it does not include the whole financial system into its analysis, and it does not directly address the role of policy-makers in the debacle. To facilitate a re-assessment of the drivers of the crisis, I constructed a rich dataset of macroeconomic indicators for the Austrian economy and collected the balance sheets and profit and loss statements of the entire financial sector bank-by-bank from 1925 until 1933. The dataset is the product of primary research based on archival sources and contemporary statistical publications. It allows me to carry out the most comprehensive investigation to date into the banking crisis that rocked the country in 1931. This paper is thus the seminal quantitative analysis that reconstructs the size, structure, risk level, and foreign exposure of the financial system. In addition, a deep analytical narrative depicts the motivations of policy-makers and

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[1] The literature refers to the industrial interests of Austrian banks as their „Konzern". The Konzern included corporations into which financial institutions were invested either as shareholders or lenders or both.

their relations to financial institutions, synthetizing the information from archival evidence, primary data, and the existing literature.

My database and analyses confirm the findings of previous research only in part. Contrary to the traditional view, the Austrian financial system was not heavily exposed to foreign creditors and banks' lending outside of Austria was small. The share of foreign currency creditors peaked at 16% of the banking sector's total assets in 1927, but declined to 11% in 1928 and 9% in 1929 and 1930.[2] This illustrates that foreign creditors were very far from being the most important financiers of Austrian financial institutions and their flight started much earlier than 1931. Furthermore, the foreign currency mismatch of Austrian banks was not of a magnitude that the central bank's enormous reserves would not have been able to cover. Finally, only a portion of banks' foreign currency lending left Austria's borders while the rest was spent domestically. The evidence thus disproves not only the instrumental role of currency risk in bringing about the crisis but also the claims regarding the post-imperial regional ambitions of the Viennese banks.

On the other hand, I concur with the literature that the universal banking structure is the key to understanding the vulnerability of the Austrian financial system. However, it is an oversimplification to consider the impact of the Konzern on the liquidity of banks as purely negative. The Konzern was actually the most important domestic creditor for large banks until 1929, accounting for 33-49% of their total financing. After 1929 intra-Konzern financing dried out; industrial connections ceased to be liquidity suppliers to large banks and instead became liquidity absorbers. The Konzern thus tied up large banks' capital only from 1929, not from the years of hyperinflation as the literature argues. Prior to 1929, the Konzern was, in fact, large banks' primary funding source.

The financial system enjoyed high levels of liquidity during the 1920s, even in 1929 and 1930. Total lending increased from 2.7 billion to 4.6 billion Austrian Schillings (AS) between 1925 and 1930 and foreign creditors only accounted for a small part of the financing available to financial institutions. This confirms that banks were able to attract substantial volumes of capital before 1931 and that this was raised domestically. Until 1929, the Konzern was undoubtedly the largest financier of the Viennese banks. The banks, in turn, acted as centers of redistribution for the industrial corporations they owned and/or financed. They collected the surplus cash from the best performing Konzern members and lent it to those enterprises within the Konzern that required additional credit. This was a source of very reliable and cheap liquidity for the large banks at the core of the Austrian financial system.

While intra-Konzern redistribution is a natural component of the universal banking system, it is only sustainable as long as the majority of its members perform sufficiently well to finance the losses of weaker members and/or if weak members are re-structured or liquidated. Restructuring and liquidation are not indicated either as write-offs on bank balance sheets or in unemployment and bankruptcy statistics for the period. Large banks continued to finance the losses of their weak industrial

[2] All of the figures regarding the financial system and individual financial institutions were collected from and calculated based on the *Compass Finanzielles Jahrbuch*, 1926-1935.

connections without writing off these non-performing loans as long as this was made possible by the performance of the rest of the Konzern.

On the aggregate, industrial output grew vigorously from 1924 until well into 1929, but specific banks began to experience distress as early as 1926. The failure of the Unionbank and the Verkehrsbank in 1926 and the Boden-Credit-Anstalt in 1929 resulted from the fact that the sound members of their Konzern could not produce sufficient liquidity to finance their industrial base while all other liquidity sources for the weaker banks dried up. Failed banks were merged into other institutions, which at the time had better access to liquidity either because their Konzern was more liquid or because they could draw on other sources of financing. Eventually, all three banks, along with their liquidity-deficient Konzerns, were absorbed into the Credit-Anstalt. By 1930, the Credit-Anstalt became a "super-bank" that, in theory, had the capacity to finance the enormous Konzern made up of its own industrial connections and the ones it had inherited from others.

However, dangerous currents emerging from the real economy soon undermined this sound-looking structure. From mid-1929, the Austrian economy was in recession, and in 1930 real GDP declined by 2.8%.[3] There was little prospect for the majority of the Credit-Anstalt's industrial connections to perform sufficiently well to finance the liquidity gaps in its Konzern. With 27% of the financial system's total assets under one roof, and with this amounting to 150% of the total annual revenues of the state budget and 16% of GDP, the Credit-Anstalt was simply too big to find other financiers sufficiently large to assure its liquidity.[4] The bank collapsed because it could not find new liquidity to continue financing its own oversized and cash-deprived Konzern. In turn, it pulled down the Austrian economy simply because it had grown too big.

How could it happen that the authorities raised no red flag despite years of loss-financing without write-offs, the continuous misrepresentation of balance sheets, and the establishment of a "super-Konzern" that, in the context of the early 1930s, was "too big not to fail"? I argue that regulators were just as interested in maintaining large banks' Konzerns as were the financial institutions. Austrian policy-makers were constrained not only by international markets that demanded parity to gold and free capital flows but also by international institutions such as the League of Nations. Due to these restrictions, neither fiscal nor the monetary policy had considerable means to stimulate the economy after World War I (WWI). However, political pressures, whether in the form of high unemployment, the fear from radical extremism or the subsequent political turmoil, required some level of economic stimulus. Policy-makers and banks, therefore, had shared interest in keeping the virtually bankrupt members of the Konzern afloat and avoiding re-organizations and liquidations that would have resulted in credit squeeze, bankruptcies, higher unemployment and slower economic recovery. Authorities considered the large banks as guarantors of economic stability and, hence, provided support and implicit and explicit guarantees for their operations.

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[3] Own calculations based on WIFO (1965).

[4] Own calculations based on ibid, *Compass Finanzielles Jahrbuch*, different years, and *Statistisches Handbuch*, different years.

The paper is structured as follows. Section I offers an overview of the macroeconomic and political economy context. Section II introduces the database constructed for this study, reviews the existing literature and tests the literature's arguments against the data. Section III demonstrates the role of industrial Konzerns as important financiers of the Austrian financial system and investigates how the demise of the industrial base caused the collapse of the Austrian financial system. The paper ends with some concluding remarks.

I - AUSTRIA IN THE YEARS BEFORE THE CRISIS

The causes of the 1931 crisis in Austria cannot be explained without understanding the legacy of the Austro-Hungarian Monarchy and the impact of the war. I argue that the political and economic challenges of the post-war system were overcome through a close cooperation between the political and the financial elite. The main motivation of both groups was to maintain the large industrial base of the old Empire.

I.1. - THE POLITICAL ECONOMY BACKGROUND

Austria was on the losing side after WWI. Based on the Peace Treaty of Saint Germain in 1919, it had to accept responsibility for the war, lost over 60% of its territory and incurred reparations liabilities. The destruction of the war and the loss of territory also encompassed a loss of private property, old economic connections and markets. There were masses of people without jobs and the country was in a political and economic turmoil (März 1984, 1990).

Since in the aftermath of the war Austria had no access to foreign financial markets and domestic capital generation was non-existent, the social burden of the lost war was financed through the printing press of the central bank. The hyperinflation that followed was ended through a League of Nations reconstruction program in 1923 which involved a large foreign loan to stabilize the currency (Marcus forthcoming). Through establishing an independent central bank, balancing the government's budget, putting limits on state borrowing, and linking the currency to gold, the League program enabled Austria to regain its international financial links.

The stabilization scheme however, also involved close international surveillance over government finances. Until mid-1926, Austria was required to submit a monthly report to the Financial Committee of the League and demonstrate a balanced budget and sound economic fundamentals. Even in the following years, representatives of the League of Nations and the Bank of England closely monitored the country's economic progress. Both the government and the central bank were restricted by the country's adherence to the gold standard and free capital flows as well as by the limits set by international organizations (Berger 2003, Obstfeld 1997). The government was thus required to run its finances conservatively and not rely on funding from the central bank, and the Austrian National Bank (ANB) was expected to have the stability of the currency as its top priority. Under these circumstances, Austrian authorities had limited room to cater to domestic needs arising from high unemployment levels, poverty or a sluggish economic recovery.

Nevertheless, domestic political pressures were substantial in an environment of general disillusion with the political, industrial and financial elite and culminated in frequent trade union demonstrations and public displays of social unrest (März 1984, 1990). Handling the social burden of war pensioners, war widows and, generally, the unemployed was hence key to reducing political instability. Since Austria's new territory was predominantly industrial, it could not rely on the agricultural sector to "hide" the unemployed and keep them fed, like did neighboring Hungary, a country with a similar post-WWI fate (Berend in Kaser and Radice 1985). As a result, 38% of the active population was unemployed in 1925.[5] Unemployment and the ensuing poverty created political instability and the country's political class feared the threat of a communist takeover similar to the one that happened in Hungary in 1919. Restarting industry, avoiding an increase in the unemployment level and spending on social benefits were thus the primary political objectives throughout the 1920s, all aiming at maintaining political stability. However, since authorities' deficit-spending was restricted by the League and international financial markets, they needed another channel through which economic growth and hence social stability could be sustained. This became the universal banking system.

I.2. - The common interest of authorities and the financial system

Austria inherited large industrial structures and a peculiar form of industrial financing from the times of the Austro-Hungarian Monarchy. Prior to WWI, industrial capacities serviced the demand of the whole Empire and that of vibrant international trade. The country's industrial development was financed through universal banks which were active financial supporters of start-ups and growth capital through shareholding as well as lending (Good 1984). Once companies' business model and profit-generating ability were solid, banks incorporated them, listed their shares through a public offering, sold all or some of their own stake in these companies and kept the lending leg of the relationship (Rudolph 1976). The close connection between universal banks and industry were further enhanced through board representations (Eigner 1997b). Universal banks thus had their own "Konzern": an industrial network that they founded, financed and were personally linked to.

In the post-war years of diminished domestic demand and international trade connections saddled by political animosity, Austria's large industrial capacities, originally fit for the whole Empire, became redundant (Mosser and Teichova in James, Lindgren, and Teichova 1991). However, besides the industrial lobby, there were two other stakeholders who were strictly against the liquidation of these old structures: the political class and financial institutions. The political class had a vested interest against liquidations since these would have led to an increase in the unemployment level and may have started a chain of bankruptcies in the economy. All these would have entailed rising political instability and the threat of a regime change. Reducing the size of industry was similarly anathema to the universal banks. Being owners as well as lenders of these companies, they would have lost their invested capital and incurred substantial losses through the bankruptcies and liquidations. Further, the reduction of industry and the ensuing unemployment and economic downturn would have meant years of low profits and a weak business environment for financial institutions. Finally, a smaller industry would

[5] Own calculations based on WIFO (1965)

have also entailed smaller universal banks, i.e. the loss of banks' economic and political clout that came with size. Therefore, universal banks, just like the political class, had a deep-rooted interest in maintaining old and excessive industrial structures.

The congruence of their interests was also reinforced by the fact that fiscal and monetary policy-makers and the owners and managers of financial institutions were closely connected at a personal level. Ausch's work provides a detailed narrative (Ausch 1968). In their study, (Weber 1991b) and (Eigner 1997b) also highlight authorities' presence in banks' management and board rooms as well as their involvement in the crises of various financial institutions during the period. An outburst from the Chancellor in connection with the Boden-Credit-Anstalt affair is also a telling example of the close relationship between banks and the government. In October 1929, when he learned of the bankruptcy of the Boden-Credit-Anstalt, Chancellor Schober called on the management of the Credit-Anstalt and told them that

> [...] he had accepted the post of Chancellor at the special request of the representatives of Finance, Commerce and Industry. He considered it therefore the duty of these representatives to spare him the trouble of any disturbance of a financial and economic character. If he could not reckon on their help in the Boden-Credit-Anstalt crisis, he would resign immediately.[6]

The person whom Chancellor Schober contacted with the above complaint was Ludwig Neurath, a member of not only the Credit-Anstalt's top management but also that of the ANB's board of directors.[7]

But perhaps the most prominent link between authorities and financial institutions was Richard Reisch. Reisch, was a former Minister of Finance, a former vice-president of the Boden-Credit-Anstalt, the president of the ANB from 1922, and the head of the Postsparkasse during its restructuring.[8] Reisch did not hide that he believed in the central bank's mission to act as a lender of last resort for the banking system which at the time, under the fixed exchange rate system of the gold exchange standard, was an unorthodox and bold attitude. In 1926, he expressed his "ars poetica" in a letter to the Bank of England: "I believe that the Bank of Issue, as chief guardian of currency and credit, is also called upon in cases of economic importance to overcome credit difficulties and to render help as far as its resources permit."[9] This position was anathema to the contemporary policies accepted and widely promoted by the Bank of England. Otto Niemeyer, a highly ranked Bank of England official, reacted to Reisch's position as follows: "I am quite clear that the sooner Reisch disappears the better."[10] This, however, did not happen and Reisch remained in his position to see through the fall of the Boden-Credit-Anstalt in 1929 as well as that of the Credit-Anstalt in 1931.

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[6] BoE Archive, File OV28/2, Statement from Schober, dated Oct 22, 1929
[7] *Compass Finanzielles Jahrbuch*, 1929 and BoE Archive, File OV28/32, Letter from Kay, dated Feb 22, 1927
[8] http://www.marshallplan.at/images/papers_berkeley/EIGNER.pdf Although there is no evidence to confirm this, it is very likely that being a former management member of the Boden-Credit-Anstalt, Reisch was eligible for future payments from the bank's pension fund, as was common practice at the time.
[9] BoE Archive, File OV28/32, Letter from Reisch, dated Dec 21, 1926
[10] BoE Archive, File OV28/32, Comments by Niemeyer to Reisch letter of 12/21/1926, dated Jan 3, 1927

Details around Reisch's involvement in the former affair clearly confirm that he was impartial towards his previous employer. Archival records reveal that Reisch chose not to listen to warnings presented to him by the management of the ANB regarding the weak position of the Boden-Credit-Anstalt and did not put an end to the ANB's rediscounting of Boden-Credit-Anstalt bills until the very end.[11] This occurred despite the fact that Reisch had been closely scrutinizing the Boden-Credit-Anstalt's financials from 1927 and was hence fully aware of the banks' financial difficulties which became clearly pronounced from 1928 (Weber 1991b). By retaining the ANB rediscount support towards the Boden-Credit-Anstalt even against questionable collateral, Reisch acted against the statutes of the ANB.[12]

Since fiscal and monetary officials were personally and/or financially linked to financial institutions, they could not and did not act as independent regulators and supervisors. Financial institutions were barely monitored and the Ministry of Finance was a key guarantor of this laxity. Austria had a Banking Commission, established in 1921 with the goal to monitor banks and make reports to the Federal Parliament (Enderle-Burcel 1994). However, the Commission was weak: it did not have enforcement rights and it was inhibited in its observations. Not surprisingly, banks did try to curtail the activities of the Commission but what is more surprising is that so did the Ministry of Finance. The Ministry did not provide the necessary information to the Commission and neglected its recommendations. The Ministry was closely connected with the banking sector and was afraid of losing this close link through the intervention of the Commission. The charter of the Commission expired on December 31, 1926 and it was not prolonged. Two years later a new body was set up, the Österreichische Revisions- und Treuhandgesellschaft whose purpose was to provide chartered accounting and audit services to the whole private sector.[13] However, audits were not compulsory: they were only carried out if requested.[14] Therefore, the financial system remained unsupervised during the period.

The country's political, economic and financial elite were thus in agreement that old industrial structures should be maintained. Universal banks were willing to finance the fixed costs of under-utilized industrial capacities and incur the low profits or losses arising from inefficiently performing industry. They could do this because they were never forced by regulators to actually write off and acknowledge any of these losses and raise fresh capital to fill in their financing gap. They could continue pretending towards the outside world that they were well-functioning banks, paying the same dividend yield each year. Authorities were willing to grant this favor to financial institutions because this helped them stay in power. By sustaining the country's underutilized industrial capacities, banks contributed to economic growth and ensured that the level of unemployment did not increase. Through this, authorities could avoid political instability and a change of regime.

I.3. - GOALS ACHIEVED - AT LEAST UNTIL LATE 1929

Large industrial capacities were hence maintained after WWI (Mosser and Teichova in James, Lindgren, and Teichova 1991) and, at least until 1929, the political elite and financial institutions

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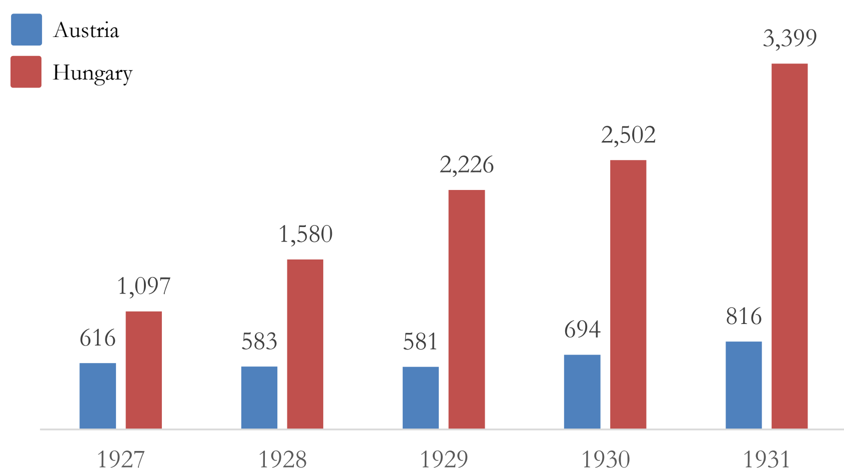
11 BoE Archive, File OV28/34, Letter from Brauneis to Siepmann, dated Oct 12, 1929
12 BoEngland Archive, File OV28/34, Letter from Brauneis, dated Oct 12, 1929
13 BoE Archive, File OV28/32, Letter from Kay to Siepmann, dated Nov 2, 1928
14 BoE Archive, File OV28/1, Draft legislation on Chartered Accountants and Raison d'etre, dated Mar 19, 1927

seemed to be benefitting from this. Bankruptcies and liquidations remained at an exceptionally low level. Figure 1 shows the number of bankruptcies and liquidations in Austria and Hungary. Even though Austria had a larger economy than Hungary did, it had fewer bankruptcies and liquidations, and their number did not increase during the period. Consequently, the level of unemployment did not rise during the second half of the 1920s: as Table 1 shows, the proportion of jobless within the active population was stagnating at around 39%. The social burden on the government budget, therefore, did not increase, the budget was balanced until 1930 and political stability was maintained.[15]

FIGURE 1 BANKRUPTCIES AND LIQUIDATIONS IN AUSTRIA AND HUNGARY, NUMBER PER YEAR



Source: ANB Mitteilungen, Statisztikai Havi közlemények

TABLE 1 UNEMPLOYMENT

	Population *number*	**Active** *number*	**Employed** *number*	**Unemployed** *number*	**Unemployment level** *%*
1925	6,582,000	3,263,000	2,010,000	1,253,000	38%
1926	6,603,000	3,235,000	1,976,000	1,259,000	39%
1927	6,623,000	3,260,000	1,993,000	1,267,000	39%
1928	6,643,000	3,294,000	2,017,000	1,277,000	39%
1929	6,664,000	3,282,000	1,998,000	1,284,000	39%
1930	6,684,000	3,221,000	1,937,000	1,284,000	40%

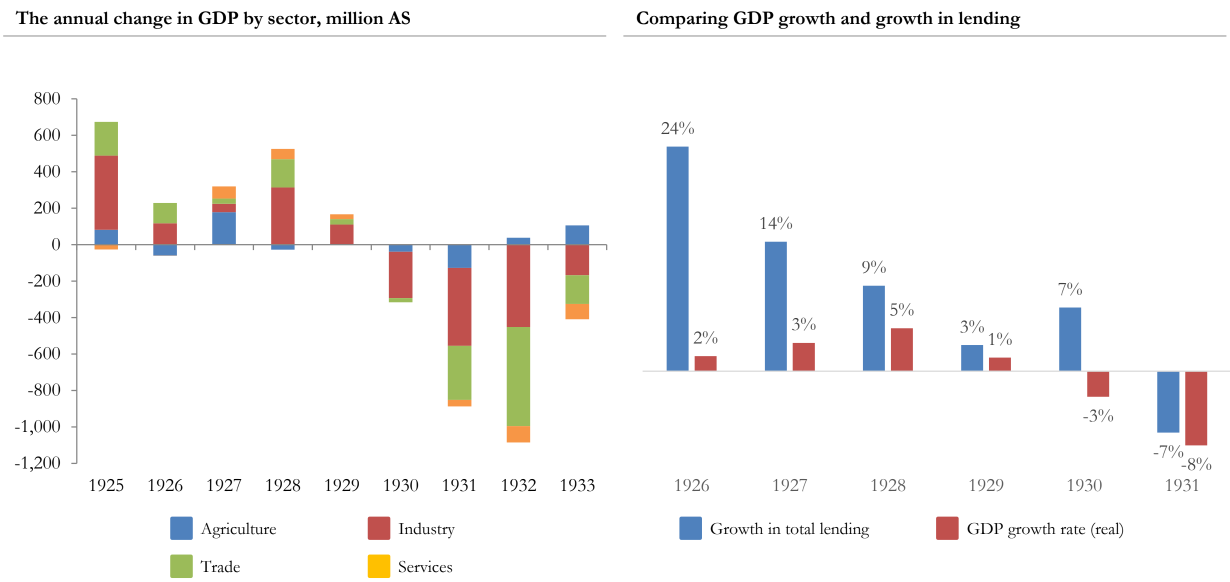
Source: Österreichs Volkseinkommen 1913 bis 1963, WIFO, 1965

Financial institutions benefitted from the general economic recovery until late 1929. The left side of Figure 2 shows the annual change in real GDP by sector. Growth was continuous until 1930, although it showed substantial volatility with 1926 and 1929 being years of subdued progress. Industry positively contributed to the performance of the economy from 1925 to 1929. The right side of Figure 2 shows that the growth of the financial system's lending exceeded that of GDP in each year during the period

[15] *Statistisches Handbuch*, various years

of recovery. Until late 1929, banks were thus supporting an industry which was well-performing and they were able to substantially increase their lending.

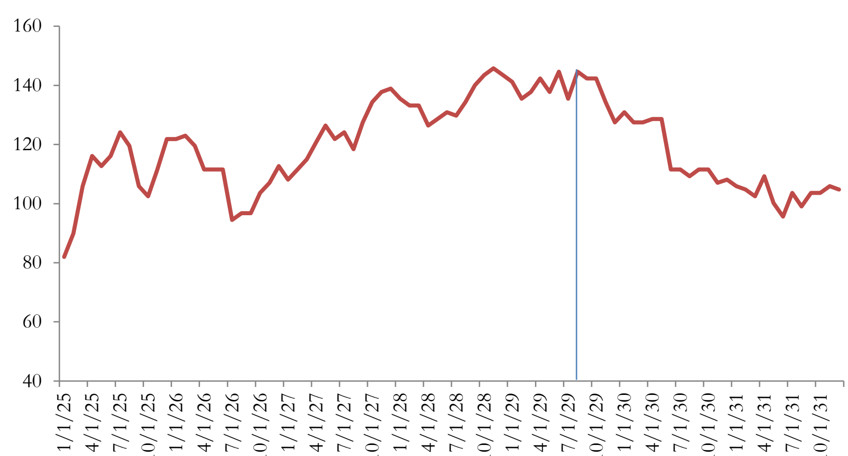
FIGURE 2 GROSS DOMESTIC PRODUCT (GDP)



Source: Österreichs Volkseinkommen 1913 bis 1963, WIFO, 1965

Source: Compass Finanzielles Jahrbuch, various years; Österreichs Volkseinkommen 1913 bis 1963, WIFO, 1965

FIGURE 3 OFFICIAL INDUSTRIAL INDEX, 1923/1931=100



Source: Monatsberichte, WIFO, 1927-1931

However, the economy fell into recession from the third quarter of 1929 (Albers and Uebele 2015). The official industrial index indicated on Figure 3 shows that the decline of Austrian industry started in July 1929. Figure 3 illustrates that from this date industry negatively contributed to the performance of the economy. The financial system's exposure to industry was thus starting to become a burden.

II. - THE AUSTRIAN FINANCIAL SYSTEM IN THE YEARS BEFORE 1931

The Austrian financial crisis of 1931 has so far been investigated through the assessment of a few large banks, esp. the Credit-Anstalt whose failure started the episode. Not only does the existing literature not include the whole financial system into its analyses, it also does not sufficiently use the available data for the evaluation of its arguments. To facilitate a re-assessment of the drivers of the crisis, I constructed a rich dataset of the Austrian financial system that allows us to properly evaluate the issue. I rely on this database to provide an overview of the entire Austrian financial system, review the arguments of the literature on the causes of the crisis and test these arguments against the data.

II.1. - DATA

Table 2 provides an overview of the database. I collected the balance sheets and profit and loss statements of the entire financial sector bank-by-bank from 1925 until 1933.[16] The dataset is the product of primary research based on a contemporary statistical publication, the *Compass Finanzielles Jahrbuch*. The *Compass* offers a description of the activities of financial institutions (similarly to an annual report) as well as their financial statements. The *Compass* published in a given year reported on financial institutions' activities and financials of two years earlier. Appendix I shows that in the *Compass* published in 1926, there were 398 individual financial institutions and of these, 284 reported their financial statements while 114 only provided limited information on their operation. As the table makes clear, financial institutions' reporting behavior improved towards the end of the period under observation. Table 2 indicates the number of balance sheets and profit and loss statements my database includes in each year.

TABLE 2 THE NUMBER OF FINANCIAL STATEMENTS IN THE DATABASE

		1925	1926	1927	1928	1929	1930	1931	1932	1933
Balance sheets		**276**	**269**	**274**	**311**	**318**	**314**	**315**	**312**	**309**
	Large Bank	8	8	6	6	6	5	5	5	5
	Other Bank	44	40	37	36	32	30	30	29	25
	Mortgage Bank	8	8	8	8	8	8	9	10	10
	Savings Bank	216	213	223	261	272	271	271	268	269
Profit and loss		**267**	**261**	**268**	**303**	**315**	**310**	**311**	**306**	**293**
	Large Bank	8	8	6	6	5	5	4	4	4
	Other Bank	39	37	35	33	31	29	29	27	18
	Mortgage Bank	8	8	7	8	8	8	9	10	9
	Savings Bank	212	208	220	256	271	268	269	265	262

Appendix II provides an assessment of the representativeness of this database. It demonstrates that my database is the first to capture what is more likely the entirety of the Austrian financial system and hence it also includes financial institutions which have been completely unaccounted for in previous studies.

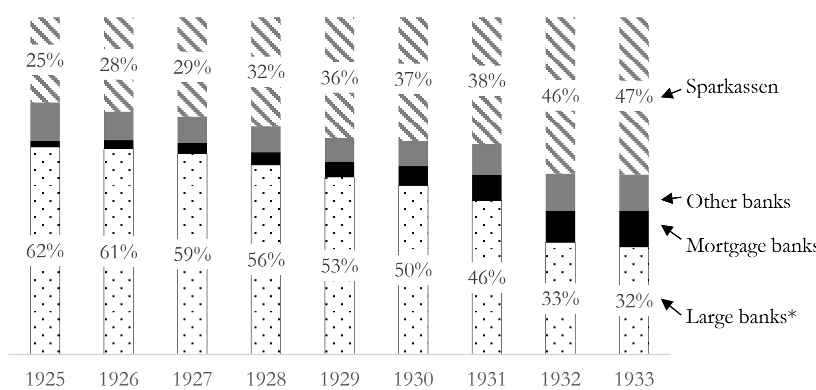
[16] Including underwriting banks (Pfandbriefinstitute), banks limited by shares (Aktien-Kredit Banken), savings banks and significant credit associations (Sparkassen und bedeutendere Kreditvereinigungen).

Unquestionably, these financial statements were often guilty of misrepresentation, but if we read them with attention to such risk, they can be effectively relied on to reconstruct a more comprehensive view of the financial system. Schubert (1991) has pointed out that the most misleading attribute of these financial statements is that they represent non-performing loans as solid, profit-producing assets. An outcome of this is that interest revenues continued to be booked on these defaulted loans, even though they were not received. Nevertheless, if the financial statements are analyzed by taking into consideration these caveats, they can provide very useful information. This study draws conclusions only based on data that can be reasonably relied on and specifically points out when data should be handled with care.

II.2. - The structure of the financial system

There were four main types of Austrian financial institutions during the interwar period and Figure 4 illustrates their share in the total assets of the whole sector. Until 1931, the Large Banks dominated. These were Viennese institutions whose number declined from eight in 1925 to five in 1930. They were the Credit-Anstalt, the Boden-Credit-Anstalt, the Wiener Bank-Verein, the Niederösterreichische Escompte-Gesellschaft, the Unionbank, the Verkehrsbank, the Landerbank, and the Mercurbank. They are the banks the existing historiography has focused upon. Savings banks (Sparkassen) were the second most important branch of the financial system until 1931 and the largest thereafter, controlling 37% of all assets in 1930. Mortgage Banks (Landeskreditinstitute) were owned and managed by provincial authorities and their significance gradually increased from 1930 but they remained minor compared to Sparkassen and Large Banks. Other Banks were the fourth category and their total assets were of a similar magnitude to those of Mortgage Banks. Among Other Banks, the largest institution was the Österreichische Credit-Institute für öffentliche Unternehmungen und Arbeiten, a state-owned bank that alone accounted for 40% of total assets within this branch in 1930.

FIGURE 4 THE SHARE OF THE VARIOUS PLAYERS IN THE TOTAL ASSETS OF THE FINANCIAL SYSTEM



** CA, BCA, WBV, NEG, Landerbank, Mercurbank, Unionbank, Verkehrsbank*
Source: Compass Finanzielles Jahrbuch, various years

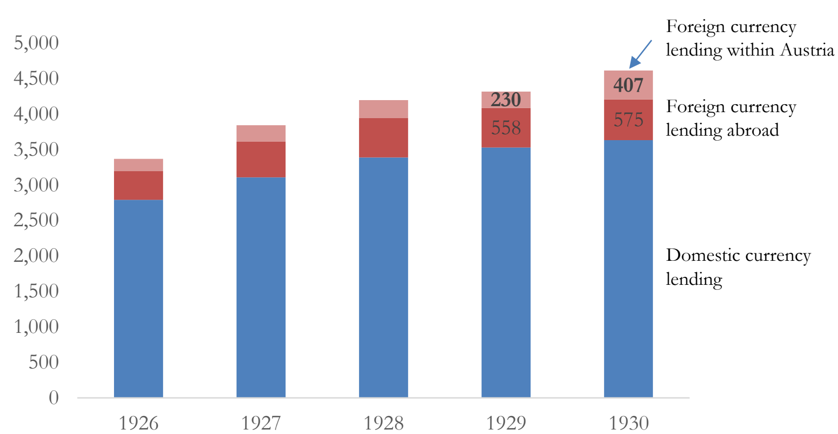
II.3. - Literature review

The historiography of the Austrian banking crisis of 1931 proposes three main explanations for the vulnerability of the banking system. First, the literature blames the fragility of Austrian financial institutions on universal banking (Teichova and Cottrell 1983, Schubert 1991, Stiefel 2008, Weber 1991a, Mosser and Teichova 1991). The close links between banks and industry had originated in the pre-1914 period and were further cemented during the years of hyperinflation, when banks converted much of their industrial loans into equity. Authors argue that the 'fitful performance' of industry in the period that followed, reduced banks' profitability, and the loans provided to the Konzern tied up financial institutions' capital that otherwise could have sought profitable enterprises. Close connections to industry thus reduced financial institutions' profitability and weakened their liquidity.

The literature's second argument blames the financial system's low levels of profitability on banks' aspirations to maintain their sphere of influence in the former empire (Stiefel 1983, Weber 2008, Hertz 1933, Schubert 1991, Eigner 1997a, Weber 1991b). Maintaining this regional presence, it has been argued, required substantial investment, but promised low returns because abroad banks could only compete in the 'lemon' segment, which increased their non-performing loan portfolio. In addition, regional adventures also required foreign currency financing which increased banks' exposure to foreign creditors. The pursuit of regional ambitions hence reduced financial institutions' profitability, weakened their liquidity and contributed to currency risk.

Finally, the literature also posits that financial institutions were excessively exposed to short-term foreign creditors (Eichengreen 1992, Kindleberger 1986, Cottrell 1983, Teichova 1994, Fior 2006). Banks borrowed short-term and in foreign currency and extended these resources to Austrian industry as long-term loans denominated in Austrian schillings. As a result, financial institutions were facing currency and maturity risks. Authors argue that as foreign creditors began to flee in 1931, currency and maturity mismatches produced gaping holes in banks' balance sheets.

FIGURE 5 TOTAL LENDING, MILLION AS



Source: Compass Finanzielles Jahrbuch, 1931, p146-147; Compass Finanzielles Jahrbuch, various years; Weber, 1991, p341

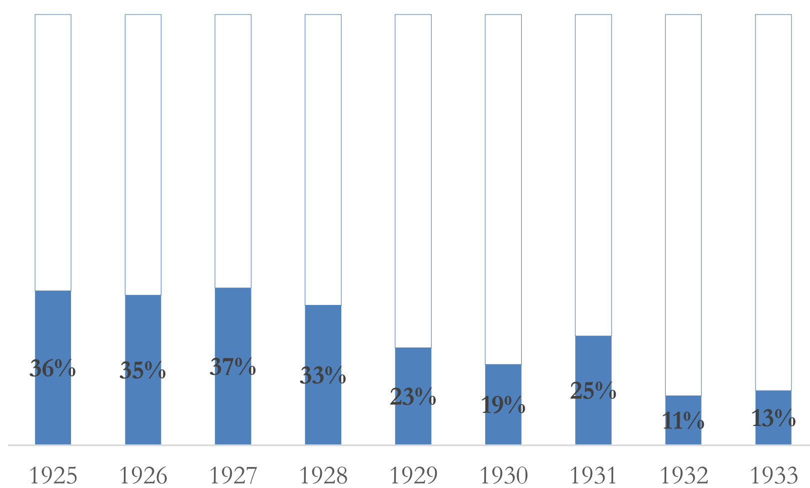
II.4 - Testing the literature's arguments against the database

The historiography's arguments have hitherto not been quantitatively tested. The database built for this study provides an opportunity for that.

Figure 5 shows that financial institutions were steadily increasing their lending during the period: total lending climbed from AS 3.37 million in 1926 to AS 4.61 million in 1930 which was an overall increase of 37%. This already suggests that the financial system was highly liquid and was able to raise substantial financing resources until 1930.

Figure 6 provides another approach to the analysis of financial institutions' liquidity. The diagram shows the proportion of assets that institutions kept in cash or cash-type items. The more cash a bank has, the more flexibly it can react to deposit withdrawals in times of crisis. From 1925 until 1928 over 33-37% of the financial system's assets was in cash. This was an exceptionally high proportion considering that the corresponding figure for Hungary was 15-17%, 12-13% for England and Wales, and 16% for Czechoslovakia, and the latter two countries did not experience a crisis in 1931.[17]

FIGURE 6 THE PROPORTION OF DEPOSITS COVERED BY DEBT ITEMS



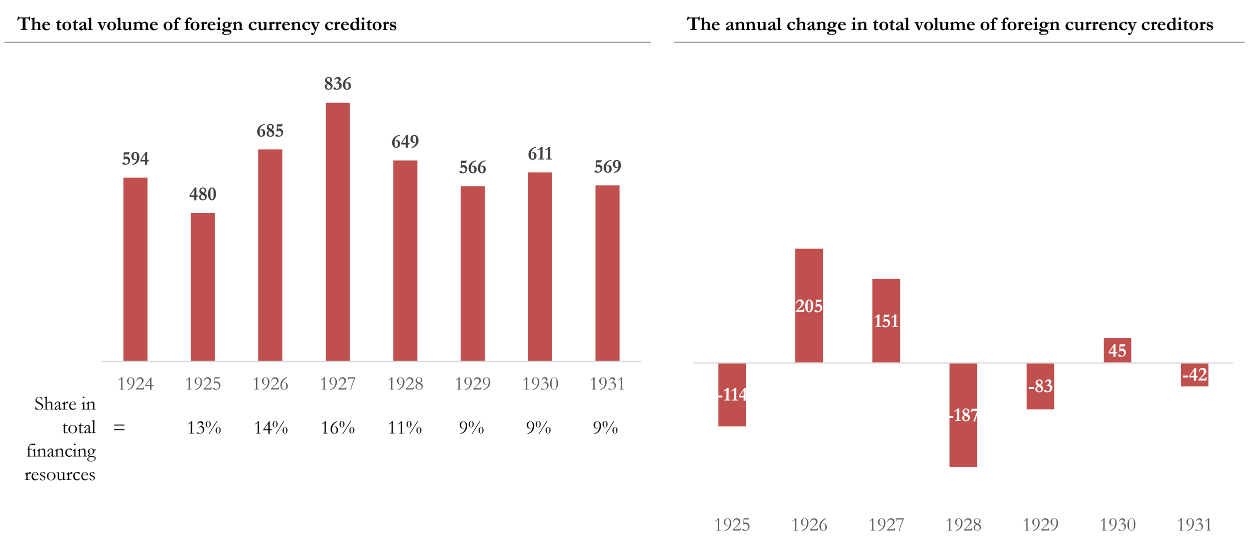
Source: Compass Finanzielles Jahrbuch, various years

The data therefore, confirm that rather than being illiquid and unable to lend due to capital being tied up in their Konzern, financial institutions were actually highly liquid and substantially increased their lending during the period. This raises the question: where did the financial sector raise the capital for lending? Based on the historiography, foreign creditors were institutions' primary source and as a result, the financial system became heavily exposed to foreign currency credit. Nevertheless, this is not confirmed by the database. The left side of Figure 7 shows the total volume of foreign creditors from

[17] For Hungary: own calculations based on *Nagy Magyar Compass*, various years; for England and Wales and Czechoslovakia: League of Nations, Commercial Banks, 1925-33.

1924 through 1931 and below the diagram, it also indicates the share of foreign creditors within the sector's total financing resources. The right side of Figure 7 depicts the annual change in foreign creditors.[18] At the height of the financial system's exposure in 1927, financing provided by foreign creditors amounted to AS 836 million and its share in Austrian banks' total financing was only 16%. From 1928, the volume of foreign creditors declined sharply. The biggest drop of AS 187 million occurred in 1928 and there was a fall of AS 83 million in 1929. From 1929, foreign creditors accounted for only 9% of total assets held by banks.

FIGURE 7 FOREIGN CURRENCY CREDITORS, MILLION AS



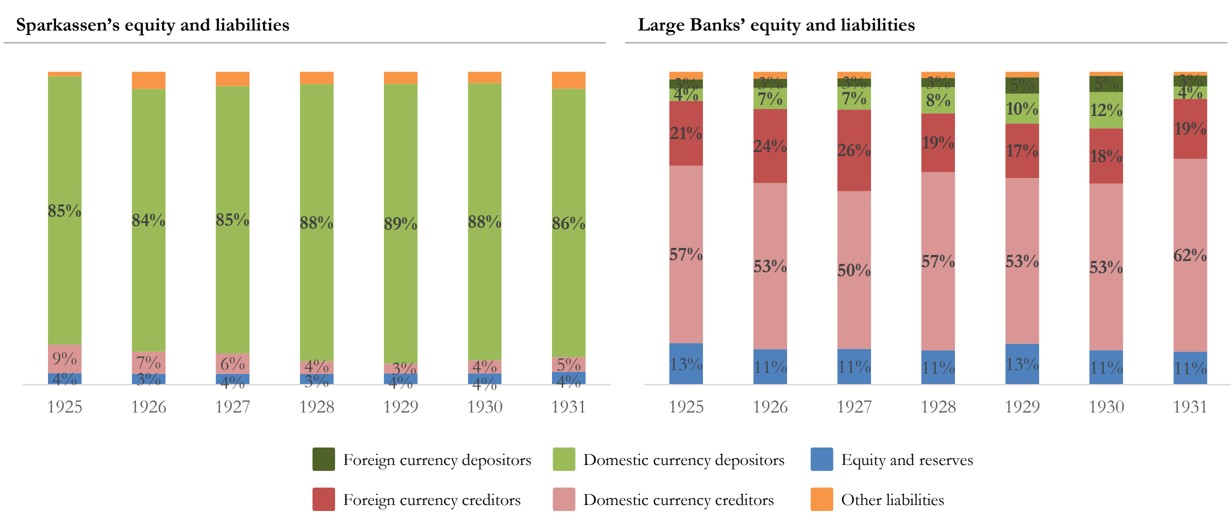
Source: Compass Finanzielles Jahrbuch, 1931, p146-147

Figure 7 reveals not only the limited significance of foreign creditors among Austrian financial institutions' capital sources but also that foreign creditors began to flee long before the 1931 crisis. The fact that the biggest flight took place in 1928 suggests that creditors may have been responding to an exogenous shock, possibly to the increase of the Federal Reserve rate (Accominotti and Eichengreen 2013). The further decline in foreign lending in 1929 is likely related to the collapse of Austria's second largest bank, the Boden-Credit-Anstalt. Interestingly, the year before the crisis, when the world was already in depression, saw an increase in foreign financing. The drop produced by the crisis in 1931 was relatively small, half of that in 1929. This suggests that "uncommitted" foreign creditors already left the country in 1928 and 1929 and the Stillhalte/Standstill agreements, signed on June 16, 1931, (Weber 1991b), which aimed at stopping the creditor flight, were made in time to keep foreign creditors in the country and were adhered to. The data thus reveal that foreign creditors actually left the Austrian financial system three years before the crisis, and the majority of those that stayed on did not flee in 1931.

[18] The *Compass Finanzielles Jahrbuch* identifies these creditors as financial institutions' "auslandische Kreditoren". This stands for foreign creditors but says nothing about the currency in which they were lending to banks. The analyses of this paper rest on the assumption that if a creditor was foreign in location, it was also foreign in terms of the currency it was lending in.

Yet, if not foreign creditors, as the literature claims, then who were the main financiers of financial institutions? Figure 8 depicts the equity and liability side of Sparkassen's and Large Banks' aggregate balance sheet. The diagrams illustrate that Large Banks and Sparkassen, the two dominant players of the financial system, significantly differed in the sources from which they raised their financing. Sparkassen relied predominantly on domestic depositors (green bars). These were Austrian private persons or corporations who kept their money on a Sparkasse account. Large Banks, on the other hand, raised only a minor part, 4-12% of their financing from depositors (green bars) and instead, they relied on foreign and domestic creditors.[19] Foreign creditors' significance was declining from 1928 and while in 1927 they accounted for 26% of Large Banks' resources, this figure declined to 18% by 1930 (red bars). Big Viennese banks' most significant financier were domestic creditors who provided 50-62% of these institutions' total capital (pink bars).

FIGURE 8 THE STRUCTURE OF THE EQUITY AND LIABILITY SIDE OF AGGREGATE BALANCE SHEETS



Source: Compass Finanzielles Jahrbuch, various years

TABLE 3 FOREIGN CURRENCY MISMATCH, MILLION AS

	1926	1927	1928	1929	1930
Foreign currency creditors, short-term	685	836	649	566	611
Foreign currency borrowers, short-term	578	734	808	788	983
Foreign currency mismatch	107	102	-159	-221	-372
Foreign currency mismatch/reserves	15.8%	13.8%	-19.9%	-29.9%	-40.0%

Sources: Compass Finanzielles Jahrbuch, 1931, p146-147; ANB Archive Mitteilungen; Compass Finanzielles Jahrbuch, various years

Even though the Austrian financial system's exposure to foreign financing was not as substantial as the literature assumed, it is still possible that institutions incurred exchange rate risk by lending more

[19] Foreign creditors are lenders of the banking system who provide financing denominated in foreign currency. Domestic creditors are lenders who provide financing in Austrian schillings and they are assumed to be domestically located players since it is highly unlikely that a foreign player would lend in Austrian schillings.

in foreign currency than the volume of foreign currency resources made available to them. Table 3 examines this risk. The first row reports the volume of foreign creditors, the second row shows the volume of foreign currency denominated lending, and the third row calculates the foreign currency mismatch. Clearly, foreign currency risks started to emerge from 1928, the year when foreign creditors started fleeing the Austrian financial system. In 1926 and 1927, Austrian institutions had more foreign currency liquidity than what they eventually extended as loans. From 1928, however, banks were granting more foreign currency loans than the volume of financing offered by foreign creditors. In 1930, the mismatch amounted to AS 372 million.

Should this be considered a high figure? The fourth row of Table 3 calculates how much of the central bank's foreign reserves would have been needed to finance the banking system's foreign currency mismatch. In 1930 the gap in foreign lending and borrowing amounted to 40% of the Austrian National Bank's (ANB) reserves. While this may be considered a substantial figure in a fixed exchange rate regime, it was not a threat in Austria because the ANB had a coverage ratio[20] of 85.3% at the end of 1930.[21] Even if the ANB had had to fill in the gap created by the foreign currency mismatch of the banking system, its gold cover would have still been 51%, well above the legal minimum of 33 1/3% (Eichengreen 1992). This suggests that neither the stability of the financial system nor the stability of the currency was threatened by the currency mismatch on financial institutions' balance sheets.

The historiography also posits that the reason why Austrian banks had a foreign currency mismatch was because they were expanding their lending to the former regions of the Monarchy. Figure 5, however, does not confirm this. The diagram shows banks' total lending by currency type (domestic and foreign) and foreign currency lending is further divided into assets placed domestically and abroad. The diagram indicates that foreign currency lending only made up a small portion of total lending and from within total foreign currency lending in 1930, only app. 60% was placed abroad. That is, only AS 575 million of the AS 983 million of foreign currency lending and the AS 4.6 million of total lending left Austria's borders. These figures do not confirm that the financial system excessively devoted itself to rebuilding its former imperial sphere of influence. On the other hand, it seems that the sector dedicated the majority of its resources to lending within Austria.

Finally, the literature also argues that banks were at risk due to the unfavorable difference in the duration of their financing resources and their assets, i.e. they borrowed short-term but were lending long-term. Table 4 provides information on the sector's maturity risk and calculates the maturity ratio for each lending type, differentiated by term.[22] The results indicate that long-term lending was balanced: banks had just as much long-term financing resources as they were placing as long-term loans. The positive maturity ratio for short-term borrowing confirms that institutions had much more short-term financing resources than the volume of their short-term assets. They used this extra funding for lending whose term is undefined on their balance sheets. These loans could be both short-term

[20] The coverage ratio or the gold cover is the ratio of the central bank's gold and foreign currency reserves and the total banknotes in circulation.
[21] Own calculations based on ANB Mitteilungen, various years.
[22] The maturity ratio is defined as the ratio of the difference in borrowing and lending of a given term and total assets.

and long-term. Therefore, unfortunately, there is insufficient information to assess the maturity risk of the financial sector's aggregate balance sheet. All we know is that it amounted to maximum 26% of their assets right before the crisis.

TABLE 4 COVERAGE RATIO FOR LENDING BY TERM

	1925	1926	1927	1928	1929	1930	1931	1932	1933
Short-term	11%	17%	18%	21%	24%	27%	29%	29%	34%
Undefined term	-12%	-16%	-18%	-20%	-24%	-26%	-26%	-26%	-30%
Long-term	2%	0%	1%	-1%	1%	-1%	-3%	-3%	-4%

Source: Compass Finanzielles Jahrbuch, various years

III. – The system of intra-Konzern redistribution

If the Austrian financial system was in a liquid position until 1930, if it was able to substantially increase its lending, if it did not suffer from obvious currency or maturity risk, and if its regional expansion was not excessive then what caused the banking crisis in 1931? The historiography is correct in pointing out that universal banking was the crux of the problem. Its impact, however, was more complicated than what has been posited by the literature. Rather than being a source of illiquidity, until 1929 the Konzern was actually financial institutions' main financier. It was the subsequent demise of the industrial base that brought about the collapse of the Austrian financial system in 1931.

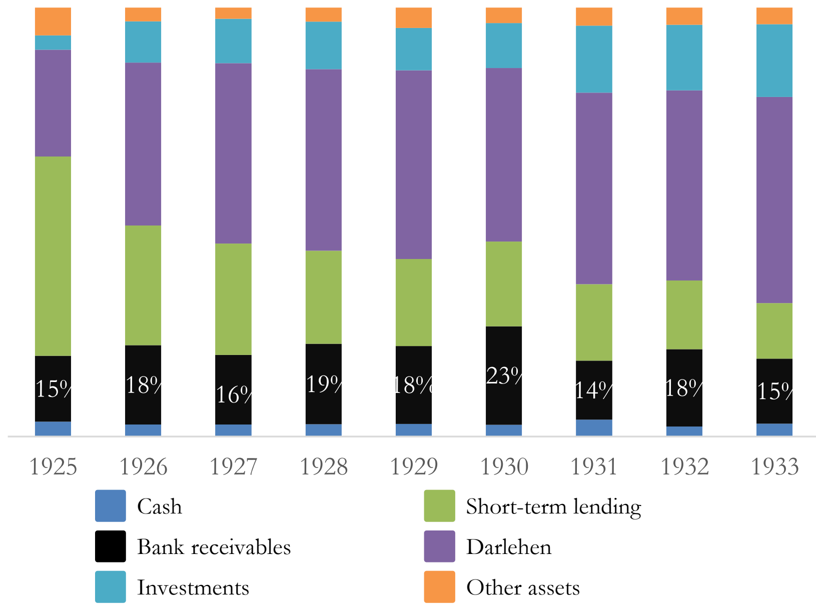
III.1. - Who were the domestic creditors?

So far one question has been left unanswered: who were Large Banks' domestic creditors? They could potentially be the state (or other public authorities), the ANB, other financial institutions, or the corporate sector. The state and the ANB could not become direct lenders to financial institutions because this was illegal.[23] Therefore, neither of them can explain the volume of domestic creditors among Large Banks' liabilities. This leaves only two other options: other financial institutions and the corporate sector.

Since Large Banks accounted for over 50%, and in the early years under observation, for over 60% of the total assets of the financial system, only Sparkassen were large enough among the other players of the sector to act as domestic financiers to Large Banks. Figure 9 examines the asset side of Sparkassen's balance sheet from 1925 until 1933 to identify asset classes which were potentially placed at Large Banks. Among the usual items a peculiar one turns up: bank receivables (Bankguthaben) which made up 14-23% of Sparkassen's assets (black bars). Bank receivables were Sparkassen deposits at or lending to Large Banks which the latter could rely on as a source of liquidity. This confirms that Sparkassen actually acted as domestic financiers for Large Banks.

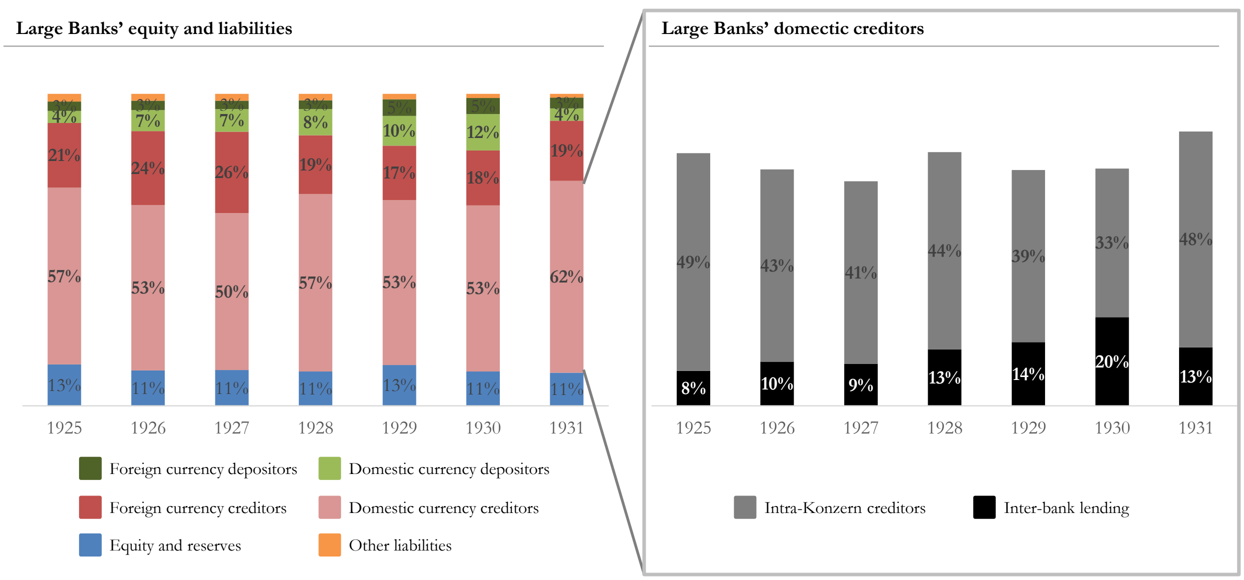
[23] BoE Archive, File OV28/32, Comments by Niemeyer to Reisch letter of 12/21/1926, dated Jan 3, 1927

FIGURE 9 THE STRUCTURE OF THE ASSET SIDE OF SPARKASSEN'S BALANCE SHEET



Source: Compass Finanzielles Jahrbuch, various years

FIGURE 10 THE STRUCTURE OF THE EQUITY AND LIABILITY SIDE OF LARGE BANKS' AGGREGATE BALANCE SHEET



Source: Compass Finanzielles Jahrbuch, various years

However, Sparkassen's bank receivables can only explain a portion of Large Banks' domestic creditors. The left side of Figure 10 illustrates the equity and liability side of Large Banks' aggregate balance sheet highlighting domestic creditors (pink bars). The right side of Figure 10 decomposes domestic creditors and shows that inter-bank lending (from Sparkassen) accounted for only 8-20% of Large Banks' financing resources (black bars). Hence the remaining part of domestic creditors, accounting for 33-49% of Large Banks' financing, came from the corporate sector (grey bars). Given the universal banking structure of the Austrian economy, this could not be any other source than Large Banks' own industrial base. That is, Large Banks' most important financier was not only of a domestic origin but it was also these financial institutions' very own Konzern.

Accordingly, Large Banks acted as centers of redistribution within their Konzern. They collected the cash generated by the liquid parts of the Konzern and they distributed this money as loans amongst the low performers or those that needed credit to grow. As a result, profitable Konzern members became Large Banks' domestic creditors.

This phenomenon also explains an apparent oddity about Large Banks. They appear thinly capitalized throughout the period under observation with their equities and reserves at only 11-13% of their total assets (blue bars on Figure 10) which raises doubts about their ability to absorb the unreported losses that the literature claims they had to endure in the 1920s. However, if one views intra-Konzern creditors as quasi-equity providers, Large Banks were in fact very well capitalized and had enough funds to sustain several years of losses. To translate this mystery of solvency into an even bigger mystery of liquidity: if, as universally believed, these banks failed to collect interest on much of the loans they extended, how were they able to pay interest on the loans that provided close to 80% of these banks' funding? In light of the finding that much of their funding came from their Konzern, the most likely interpretation is that even if Large Banks had to book interest expenses on this intra-Konzern funding, they did not actually have to make the payments on those payables. That is, in reality, intra-Konzern financing acted as a source of free funding for Large Banks.

III.2. - Cracks in the Konzerns in the 1920s

The intra-Konzern redistribution, however, was a precarious game that was secure only as long as the well performing members of the Konzern produced enough surplus cash to finance the ailing members. Theoretically, Large Banks, using the resources of the good performers of the Konzern, could have re-organized the operations of the weak performers among their industrial connections or could have eventually liquidated them. This however, did not happen. Both reorganizations and liquidations would have resulted in write-offs on institutions' balance sheets, higher unemployment levels and an increasing number of bankruptcies. There is no indication of either of these taking place. There were no or negligible write-offs in financial institutions' annual reports [24] and previous paragraphs have established that bankruptcies remained at an exceptionally low level and the level of unemployment did not increase. This confirms that Large Banks adopted a "wait-and-see" approach: hoping for good times, they did not write off the non-performing loans of the weak members of the Konzern and rather used the good money from the high performers to finance the losses of the weak ones. This game was sustainable only as long as the Konzern was a net cash provider. Once the Konzern became a net cash absorber, a scramble for new liquidity started and only those Large Banks could remain standing which had access to sufficiently large volumes of liquidity from other sources to shore up the weak performers. The three Large Bank failures of the second half of the 1920s

[24] Based on financial statements reported in the *Compass Finanzielles Jahrbuch*, 1926-1935

illustrate that there were significant differences across Large Banks in terms of the performance of their Konzern and their access to liquid capital.

TABLE 5 THE STRUCTURE OF THE THREE LARGE BANK MERGERS DURING THE 1920S

	Credit-Anstalt (CA) - Boden-Credit-Anstalt (BCA	**Boden-Credit-Anstalt (BCA) - Unionbank**	**Boden-Credit-Anstalt (BCA) - Verkehrsbank**
Receiving bank	CA	BCA	BCA
Merged bank	BCA	Unionbank	Verkehrsbank
Successor entity	CA	BCA	BCA
Year	1929	1926	1926
Information on the structure of the merger	- CA issued 275,000 new shares in the total value of AS 96m on January 1, 1930 (capital increase) - This translated to a per share value of app. AS 349 - The market price of CA shares at the end of 1929 was AS 50.75, the market price of BCA shares on the last day of 1929 was AS 99.75 - The new CA shares were swapped for BCA shares at a ratio of 1:4 - In addition, the CA issued shares at the value of AS 125m on January 1, 1930 for which shareholders had no subscription right	Equity: - Capital increase of AS 15m by issuing new shares - BCA purchases Unionbank through a share swap in the ratio of one BCA share for 18 Unionbank shares Assets: - The BCA's assets increased from AS 506m in 1926 to AS 846m in 1927 - The Unionbank's assets in 1926 were AS 178m	Equity: - Capital increase of AS 15m by issuing new shares - BCA purchases Verkehrsbank through a share swap in the ratio of one BCA share for 33 Verkehrsbank shares Assets: - The BCA's assets increased from AS 506m in 1926 to AS 846m in 1927 - The Verkehrsbank's assets in 1926 were AS 139m
Interpretation of the share swap	Based on market prices: - one AS 50 CA share bought four AS 100 BCA shares - equity holders of the BCA incurred 87.5% loss (1 BCA share was paid AS 12.5 instead of AS 100) Based on book value (BV): - BV of equity at BCA in 1928: AS 130/share - BV of equity at CA in 1928: AS 56/share - a holder of one BCA share valued at AS 130 received AS 14 for his share, i.e. incurred a 90% loss	Based on market prices: - one AS 125.8 BCA share bought 18 AS 6.6 Unionbank shares - One Unionbank share was paid AS 6.99 instead of AS 6.6 Based on book value (BV): - BV of equity at BCA in 1926: AS 84.67/share - BV of equity at Union in 1926: AS 45/share - a holder of one Unionbank share valued at AS 45 received AS 4.7 for his share, i.e. incurred a 90% loss	Based on market prices: - one AS 125.8 BCA share bought 33 AS 3.75 Verkehrsbank shares - One Verkehrsbank share was paid AS 2.67 instead of AS 3.75 Based on book value (BV): - BV of equity at BCA in 1926: AS 84.67/share - BV of equity at Verkehrsbank in 1926: AS 32.07/share - a holder of one Verkehrsbank share valued at AS 32.07 received AS 2.57 for his share, i.e. incurred a 90% loss
Acknowledged losses	- AS 55m was the BCA's equity in 1928 - Of this 90%, i.e. AS 49.5m was recognized as a loss - This was only 5.8% of the BCA's total assets in 1928	- AS 28m was the Unionbank's equity in 1926 - Of this 90%, i.e. AS 25.2m was recognized as a loss - This was only 14.1% of the Unionbank's total assets in 1926	- AS 8.75m was the Verkehrsbank's equity in 1926 - Of this 90%, i.e. AS 7.875m was recognized as a loss - This was only 5.7% of the Verkehrsbank's total assets in 1926
Conclusion	Bail-in of shareholders: - 90% loss ratio Bail-in of depositors and creditors: - Guaranteed by the authorities	Bail-in of shareholders: - 90% loss ratio Bail-in of depositors and creditors: - None: depositors and creditors did not incur any losses	Bail-in of shareholders: - 90% loss ratio Bail-in of depositors and creditors: - None: depositors and creditors did not incur any losses

Source: Compass Finanzielles Jahrbuch, 1926-1936

The number of Large Banks declined from eight in 1925 to five in 1930. In 1926, the Unionbank and the Verkehrsbank and in 1929, the Boden-Credit-Anstalt failed. The first two were merged into the third, while three years later the Boden-Credit-Anstalt was absorbed by the largest Large Bank, the Credit-Anstalt. Although the three merged banks' official profit and loss statements are useless for analyzing these failures, the structuring of the aforementioned mergers reveals important information. Table 5 presents the details. The transactions were structured through a share swap. The valuation of the swaps reveals that in each of the three cases the shareholders of the acquired entity incurred an app. 90% discount in the value of their equity investment. The very fact that the equity holders of the "acquired" entity were willing to enter into a transaction at such terms, and thereby accept such an enormous loss on their share capital confirms that the three merged banks were in severe financial distress.

However, this distress was not fully acknowledged by the structure of these transactions. The liabilities of failed banks (i.e. the depositors and creditors) were transferred from the merged entity into the successor entity at book value, confirming that the value of these financing resources did not depreciate. Therefore, the structure of these transactions recognized failing institutions' non-performing assets and past losses only to the extent of shareholders' reduced capital but not beyond that. The column "Acknowledged losses" of Table 5 calculates the amount of losses that were actually admitted at the mergers. In the case of the Unionbank this amounted to 14.1% of assets while for the Verkehrsbank and the Boden-Credit-Anstalt the figure was even lower, only 5.7% and 5.8%, respectively. It is very unlikely that shareholders were willing to give up almost their whole ownership stake for such low cumulative losses. It is much more likely that the failed institutions' past losses were not fully written off but kept on the successor entity's books.

The 90% figure used in all three mergers reinforces this view. While it is theoretically possible that in each of the three transactions the magical 90% of equity discount exactly accounted for each individual bank's past losses, it is much more likely that the 90% figure was an industry "best practice". The recurring 90% figure in these mergers was a solution which served the interest of all parties involved. Rather than having to acknowledge the actual losses of their Konzern, the failed banks' owners could strike a deal with another bank which was also interested in maintaining the failing Konzern. The loss of 90% of their capital was the price that the failing bank's shareholders paid for keeping their Konzern in operation, keeping the board seats they had in their Konzern companies, and for the opportunity to remain minority owners of the successor entity. Considering that they could have been left with nothing, this seems like a good deal. On the other hand, the managers of the absorbing financial institution also gained from the arrangement. They could very cheaply expand their Konzern and become managers over an even larger industrial empire. Additionally, they were able to avoid the write-offs and liquidations within industry which could have started a chain reaction of bankruptcies that could have easily melted away their own Konzern. The mergers were thus complicit agreements between bank managers who were all interested in hiding the losses of the failing Konzern.

The political class had vested interest in the same. They supported the mergers because through this they could avoid liquidations as well as the write-off of depositors' capital placed in the failing bank. Both of these would have led to an increase in unemployment levels, lower consumer spending and hence to subdued economic growth. There is evidence that in the case of at least two of these three mergers, authorities were actively involved and supported the arrangement. Perhaps in the case of the Verkehrsbank transaction it could be argued that authorities' lack of information was the reason why they overlooked imprudent practices. However, this argument breaks down for the Unionbank and the Boden-Credit-Anstalt amalgamations. Archival records reveal that early on the Wiener Bank-Verein and the Niederösterreichische Escompte-Gesellschaft were the main contenders for the Unionbank's shares.[25] However, the Boden-Credit-Anstalt emerged as the final winner, allegedly due to political involvement, in particular, because of Reisch's close connections to the bank and his involvement in the Unionbank decision.[26] Further, in the case of the Boden-Credit-Anstalt and Credit-Anstalt merger, authorities were not only closely involved and hence knew fully well of the structure of the transaction but also forced the deal through against the will of the Credit-Anstalt's management (Schubert 1991). Policy-makers were thus clearly the brains behind the transaction which accepted that the Boden-Credit-Anstalt's past losses were not recognized and at the same time ensured that its Konzern remained intact. Clearly, politicians had an important stake in Large Banks' continued operation which ensured that the economy was ticking along and thereby the political status quo was not threatened.

Since past losses were not acknowledged at these transactions, the cash-deprived and probably non-viable Konzern companies were kept alive within the absorbing bank. These failing companies continued to use up fresh funds from the acquirer – a classic case of throwing good money after bad. There may be two reasons why the absorbing institution could finance the failing Konzern of the merged bank. Either its own Konzern was a sufficiently large surplus cash producer that was able to generate enough liquidity for the absorbed, failing Konzern, or the acquiring institution had superior access to other, new sources of funding. It is therefore, not surprising that it was the Credit-Anstalt, the bank with the largest balance sheet, largest Konzern, and the most extensive international network that ended up as the "acquirer of last resort". However, this chain of mergers did nothing else than hid past losses and deepened the problems of the Austrian banking system.

III.3. - The state's actions to defer the breakdown

The failure of the Boden-Credit-Anstalt made clear that financing options were running out for Large Banks: foreign creditors were gone and the economy was falling into a recession which was precluding a substantial recovery of intra-Konzern lending or an increase in the deposit base. At this point, authorities stepped in and became increasingly active in their support for the financial system. On the one hand, they were aware that another Large Bank failure had to be avoided. After its merger with the Boden-Credit-Anstalt, the Credit-Anstalt's total assets accounted for 27% of those of the whole financial sector, i.e. the bank was comparable in size to all Sparkassen taken together.[27] If the Credit-Anstalt had also had to go under, there would simply have been no other financial institution which would have been able to absorb its losses. Additionally, since authorities actually forced the merger on the management of the Credit-Anstalt, they had to find ways to ensure that the bank was compensated for the burden it had taken on. On the other hand, authorities also realized that the recession and the deterioration of industrial performance simply did not allow the financial system to continue lending

[25] BoE Archive, File OV28/32, Letter from Kay, dated Sep 20, 1926

[26] BoE Archive, File OV28/32, Letter from Kay, dated Mar 2, 1927

[27] Own calculations based on the *Compass Finanzielles Jahrbuch*, various years.

at the same pace as before. The government, therefore, started to directly intervene into the financial system to boost banks' lending activity. Through these solutions policy-makers were able to defer the eventual breakdown of the financial system for a year.

After its merger with the Boden-Credit-Anstalt, the Credit-Anstalt received the largest support from the government. Besides providing tax and duties exemptions, it was rumored that the government made a pledge to guarantee all of the deposits and ANB advances of the merged entity.[28] The value of this assumed government liability is unclear because neither merging bank reported the liquidity support it received from the ANB. At a minimum, the value was around AS 290 million but it could have been as high as AS 1,000 million. This translated to 15-52% of total government revenues or 2.4-8.3% of the nominal GDP for 1929. This was an outstandingly high off-balance sheet liability for the state in the middle of a recession.[29]

On top of the government's guarantee the Credit-Anstalt was also treated to the ANB's scheme, the so-called cross-deposits. Through this channel the ANB was able to indirectly lend to the Credit-Anstalt.[30] After the merger, the ANB made an agreement with a number of foreign banks based on which it deposited certain US dollar or British pound amounts at these banks who then in turn deposited the same amounts at the Credit-Anstalt for a profit margin of 1%. The estimated total value of cross-deposits was USD 7 million, app. 5% of the Credit-Anstalt's total assets in 1930 (after its merger with the Boden-Credit-Anstalt).[31]

From 1930, authorities also provided general support to the financial system and, through that, indirectly to the economy, to ensure that lending continued to increase even when Large Banks and their Konzerns were already failing. Since the state could not lend directly to financial institutions, it had to find an indirect channel. This became state guarantees provided to publicly-owned Mortgage Banks and Other Banks. The guarantees can be tracked down on these financial institutions' balance sheets. The left side of Figure 11 shows the annual change in the various items on the equity and liability side of Mortgage Banks' and Other Banks' aggregate balance sheet. There was a large increase in the financing resources of these institutions, AS 116 million and AS 272 million in 1930 and 1931, respectively. The source of this increase was one item, the so-called Darlehen, or special loans (purple bar). The right side of Figure 11 shows the annual change of the asset side of Mortgage Banks' and Other Banks' aggregate balance sheet, the asset side. The diagram shows that in 1930 and 1931 the Darlehen category of the asset increased almost by the same extent as did the Darlehen of the liability side in these same two years.

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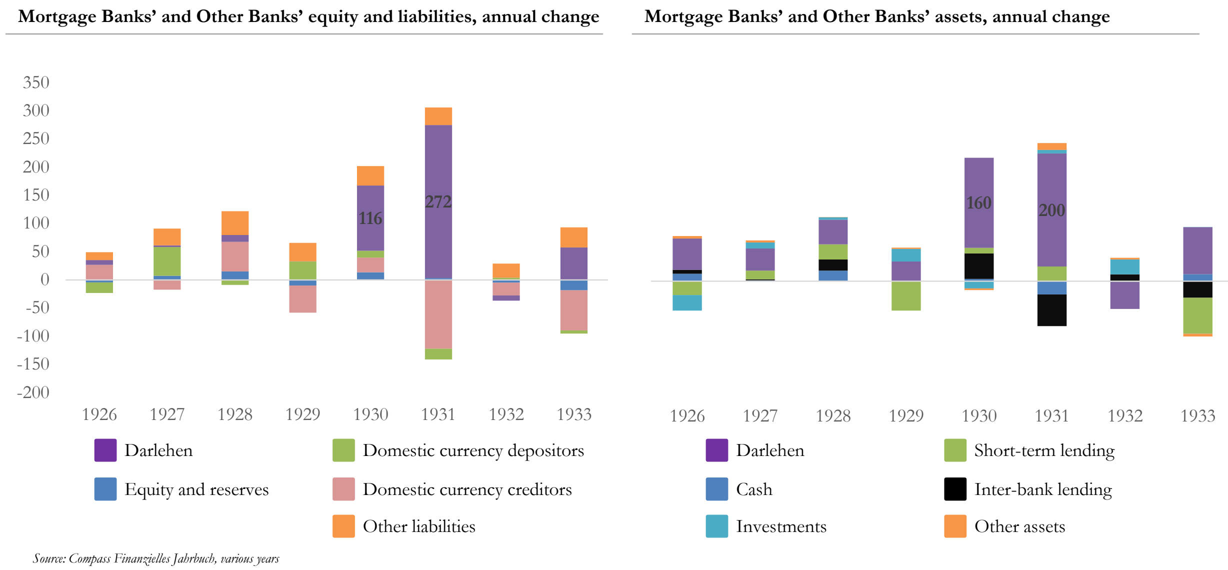
[28] BoE Archive, File OV28/2, Memorandum on the BCA

[29] Own calculations based on *Compass Finanzelles Jahrbuch* and *Statistisches Jahrbuch*, various years

[30] BoE Archive, File OV28/75, the whole file is concerned with the cross-deposits scheme

[31] BoE Archive, File OV28/75, Telegram from Hunter, New York Trust Co., Jun 5, 193; Weber 1991b puts this figure at USD 14-15 million but I have found no evidence for that.

Figure 11 The change in the equity and liabilities of Mortgage Banks' and Other Banks' aggregate balance sheet



There were three institutions which accounted for the majority of the increase in the Darlehen category on both sides of the balance sheet. The first and largest recipient was the Österreichische Credit-institute für öffentliche Unternehmungen und Arbeiten, a state-owned bank which received AS 75 million in 1930 and AS 150 million in 1931 under this liability category.[32] The other beneficiaries were two Mortgage Banks, the Tirolische Landes-Hypothekenanstalt[33] which received AS 7.1 million in 1931 and the Kommunalkreditanstalt des Landes Oberösterreich[34] which obtained AS 13 million in 1930 and AS 26.7 million in 1931. A closer look at the financial statements of the three largest Darlehen recipients reveals that the very amount they received in a given year as a Darlehen liability was spent in full (granted as loans) in the same year and under the same special loan category. The fact that these items were under the same balance sheet category and of the same magnitude on the liability and assets sides of these institutions confirms that these monies were labelled: they were received for a given purpose and they had to be spent on that very purpose.

The three Darlehen recipients were all state-owned or provincial municipality-owned and run institutions and their liabilities were fully guaranteed by their owner. The institutions raised and spent these special loans according to a 1929 federal legislation.[35] The specific balance sheet category under which they obtained and had to spend the money was housing loans or housing support. This reveals that these banks obtained indirect state support, i.e. state guarantees for increasing their liabilities and the monies they raised under these guarantees had to be spent for the stimulation of the economy.

[32] *Compass Finanzielles Jahrbuch*, 1933, p297-303
[33] Ibid. p321-24
[34] Ibid. p330-31
[35] Ibid. p301

Monies spent on this purpose accounted for 54% of the increase in the total lending of the whole financial system in 1930 – even though the total assets of these institutions made up only 13% of those of the whole financial system.[36]

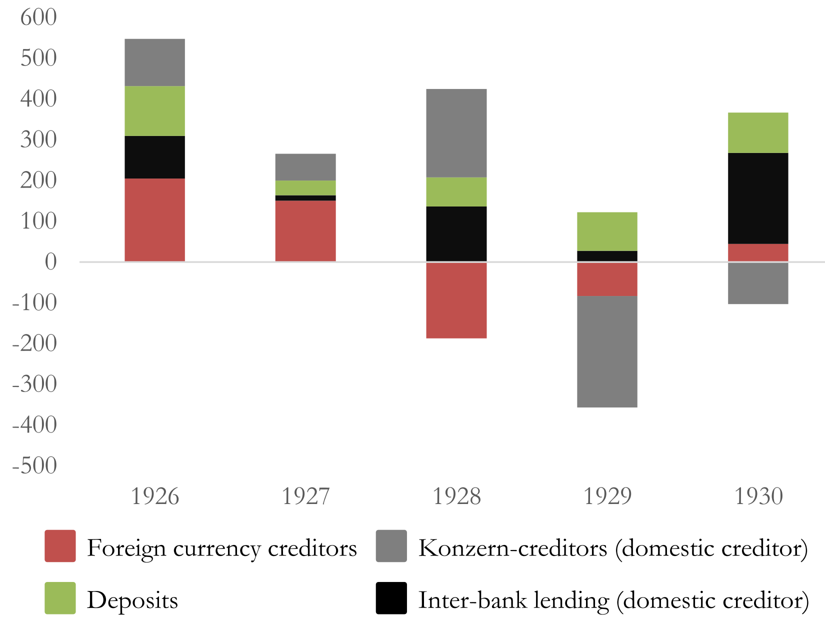
III.4. - The final crack in the biggest Konzern

Authorities' support and guarantees could only defer but not help avoid the collapse of the financial system. After app. five years of GDP growth, from July 1929 the Austrian economy fell into a recession and the availability of intra-Konzern financing declined. Figure 12 shows the annual change in Large Banks' external financial resources between 1926 and 1930. The data reveal that before 1929 the aggregate Konzern positively contributed to Large Banks' capital (grey bars). During these years, institutions could depend on their strong industrial enterprises which produced extra liquidity and were able to lend these profits to Large Banks. Even though the Verkehrsbank and the Unionbank failed, the remaining institutions had a sufficiently well-performing Konzern that could absorb and finance the other two banks' weak Konzerns. In 1929 and 1930, however, the resources available from banks' industrial connections substantially declined and became net negative. This suggests that at the failure of the Boden-Credit-Anstalt, there was no prospect for further intra-Konzern financing because the Konzerns of the remaining five Large Banks were also already liquidity absorbers. In 1929, the Konzern pulled back AS 273 million, in 1930 AS 103 million financing from Large Banks. Since institutions were unwilling to write off the non-performing loans and incur the losses arising from their industrial connections, they had to look for new sources of liquidity to finance the increasingly distressed Konzern.

The low performance of their Konzerns made Large Banks effectively insolvent by 1929. It was not a question of whether but when these financial institutions would experience a crisis and this depended on their options to find new liquidity. However, new financing sources became increasingly limited. Figure 12 shows that foreign creditors (red bars) had been leaving since 1928. Their rise in 1930, possibly attributable to the ANB's cross-deposits scheme, was insufficient to compensate for the loss of intra-Konzern financing. The economy was sinking into a recession, precluding the recovery of intra-Konzern lending. Only Sparkassen remained as potential financiers who had a sufficiently sizeable aggregate balance sheet to support Large Banks. They substantially increased their lending to Large Banks in 1930 (black bars). However, their overall liquidity depended on depositors and the deepening recession from 1930 did not provide great prospects for an increase in the deposit base. Large Banks, therefore, were running out of options to mask their insolvency behind new liquidity.

[36] The Österreichische Credit-institute für öffentliche Unternehmungen und Arbeiten had a 12% ownership stake in the Credit-Anstalt, the leading Large Bank (Weber 1991b) and the Credit-Anstalt was also involved in the housing loan project through its mother institution. (*Compass Finanzielles Jahrbuch*, 1933, p301)

FIGURE 12 THE CHANGE IN LARGE BANKS' LIABILITIES, MILLION AS



Source: Compass Finanzielles Jahrbuch, various years

As all potential sources of liquidity ran out, the only remaining source was the state. When in early 1931 it became clear to the management of the Credit-Anstalt that the pyramid scheme that the Austrian banking sector had become could no longer be maintained, they turned to the authorities for support. They did this not because they lost the trust of their foreign or domestic creditors and depositors and the capital flight triggered this response. They were forced to do it because there was no new liquidity behind which they could have hidden the years of insolvency. The Austrian banking system's carefully maintained façade of stability broke down and the run on the bank started.

CONCLUDING REMARKS

The path which led Austria to the crisis of 1931 was not for its economic actors to choose; they simply had no alternatives. Desperate authorities were trying to find means to stimulate the economy in an increasingly hostile political environment. The fixed exchange rate system and capital mobility promoted by international organizations, and the latter's close surveillance of government finances demanded restrictions on public spending and borrowing. The social and political situation, however, required authorities to spend in order to maintain economic stability. Relying on the banking system to sustain the country's ailing industry was the only feasible alternative for clandestine economic stimulus. Viennese banks, on the other hand, had to find a viable business model after having been squeezed out of much of Central Europe and deprived of former market networks. They could not allow their Konzern to go under and their industrial base to shrink because that would have threatened the remaining purpose of their existence. Banks and authorities were hence united in their goal to sustain the old industrial structure at all cost. The unfortunate outcome was that this eventually pulled down the banking system.

Appendix I

The number of financial institutions in the database:

	Compass 1926			Compass 1927			Compass 1928		
	Total	**Report-ing**	**Non-report-ing**	**Total**	**Report-ing**	**Non-report-ing**	**Total**	**Report-ing**	**Non-report-ing**
Number of fin. inst.	398	284	114	382	264	118	364	274	90
Large Bank	8	8	0	8	8	0	8	8	0
Other Bank	87	49	38	75	34	41	62	44	18
Mortgage Bank	9	9	0	9	8	1	8	8	0
Savings Bank	294	218	76	290	214	76	286	214	72

	Compass 1929			Compass 1930			Compass 1931		
	Total	**Report-ing**	**Non-report-ing**	**Total**	**Report-ing**	**Non-report-ing**	**Total**	**Report-ing**	**Non-report-ing**
Number of fin. inst.	352	272	80	342	311	31	340	318	22
Large Bank	8	6	2	6	6	0	6	5	1
Other Bank	48	37	11	40	36	4	39	34	5
Mortgage Bank	9	8	1	10	8	2	9	8	1
Savings Bank	287	221	66	286	261	25	286	271	15

	Compass 1932			Compass 1933			Compass 1934		
	Total	**Report-ing**	**Non-report-ing**	**Total**	**Report-ing**	**Non-report-ing**	**Total**	**Report-ing**	**Non-report-ing**
Number of fin. inst.	334	315	19	329	313	16	321	312	9
Large Bank	5	5	0	5	5	0	5	5	0
Other Bank	36	31	5	34	31	3	31	29	2
Mortgage Bank	10	8	2	10	9	1	10	10	0
Savings Bank	283	271	12	280	268	12	275	268	7

	Compass 1935		
	Total	**Report-ing**	**Non-report-ing**
Number of fin. inst.	318	307	11
Large Bank	5	5	0
Other Bank	31	26	5
Mortgage Bank	10	10	0
Savings Bank	272	266	6

APPENDIX II

The assessment of the representativeness of the database:

Category	Source	1929	% covered by database as of 1929
Total assets for the whole financial sector	This database	6,183,842,263	
Total assets for Sparkassen	This database	2,213,307,452	
Total assets for joint-stock banks	This database	3,970,534,811	
Total assets for joint-stock banks	Weber, 1991b	3,800,000,000	104%
Total assets for the whole financial sector	Statistical Handbuch	4,872,533,227	127%
Total assets for Sparkassen	Statistical Handbuch	1,524,392,227	145%
Total assets for joint-stock banks	Statistical Handbuch	3,348,141,000	119%
Deposits for the whole financial sector	This database	2,606,177,392	
Deposits for the whole financial sector	Weber, 1991b	1,435,000,000	182%
Deposits for the whole financial sector	Statistical Handbuch	1,945,339,817	134%
Creditors for the whole financial sector	This database	2,692,543,667	
Creditors for the whole financial sector	Weber, 1991b		
Creditors for the whole financial sector	Statistical Handbuch	2,210,324,240	122%
Short-term borrowers (Debitoren) of the whole financial sector	This database	2,858,425,511	
Short-term borrowers (Debitoren) of the whole financial sector	Weber, 1991b	2,731,000,000	105%
Short-term borrowers (Debitoren) of the whole financial sector	Statistical Handbuch	2,275,111,530	126%

BIBLIOGRAPHY

Accominotti, Olivier, and Barry Eichengreen. 2013. *The Mother of All Sudden Stops: Capital Flows and Reversals in Europe, 1919-32*, *NBER Working Paper No. 19580*: Cambridge, Mass. National Bureau of Economic Research.

Aguado, Iago Gil. 2001. "The Creditansalt Crisis of 1931 and the Failure of the Austro-German Customs Union Project." *The Historical Journal* 44 (1):199-221. doi: 0.1017/S0018246X01001728.

Albers, Thilo, and Martin Uebele. 2015. "The Global Impact of the Great Depression." Economic History, London School of Economics and Political Science (218/2015).

Ausch, Karl. 1968. *Als die Banken fielen - Zur Soziologie der politischen Korruption*. Wien, Austria: Europa Verlag.

Butschek, Felix. 1985. *Die österreichische Wirtschaft im 20. Jahrhundert*. Stuttgart: Gustav Fischer.

Butschek, Felix. 1994. "Long-term Patterns of Economic Growth." In *Economic transformations in Eastern Europe : legacies from the past and policies for the future*, edited by David F. Good. London-New York: Routledge.

Butschek, Felix. 2011. *Österreichische Wirtschaftsgeschichte - : von der Antike bis zur Gegenwart*. Edited by Wirtschaftsforschung Österreichisches Institut für. Wien: Böhlau Wien.

Calomiris, Charles W. 2014. *Fragile by design : the political origins of banking crises and scarce credit*. Edited by Stephen H. Haber: Princeton: Princeton University Press.

Cottrell, P. L. 1983. "Aspects of Western equity investment in the banking systems of East Central Europe." In *International business and Central Europe, 1918-1939*, edited by Alice Teichova and P. L. Cottrell. Leicester, Leicestershire: New York: Leicester University Press - New York : St. Martin's Press.

Cottrell, Philip L. 1994. ""Mushrooms and dinasaurs": Sieghart and the Boden-Credit-Anstalt during the 1920s." In *Universal Banking in the Twentieth Century, Finance, Industry and the State in North and Central Europe*, edited by Alice Teichova, T. R. Gourvish, Ágnes Pogány and P. L. Cottrell. Aldershot, England-Brookfield, Vt: Edward Elgar.

Cottrell, P. L., ed. 1997. *Rebuilding the financial systems in Central and Eastern Europe, 1918-1994*. Aldershot: Scolar.

Curcuru, Stephanie, Charles Thomas, and Francis Warnock. 2008. *Current Account Sustainability and Relative Reliability*. Cambridge, Mass: National Bureau of Economic Research.

Diamond, Douglas, and Philip Dybvig. 1983. "Bank Runs, Deposit Insurance, and Liquidity." *The Journal of Political Economy* 91 (3):401.

Diamond, Douglas W., and Raghuram G. Rajan. 2005. "Liquidity Shortages and Banking Crises." *The Journal of Finance* 60 (2):615-647. doi: 10.1111/j.1540-6261.2005.00741.x.

Diaz-Alejandro, Carlos. 1985. "Good-bye financial repression, hello financial crash." *Journal of Development Economics* 19 (1-2):1-24.

Eichengreen, Barry J. 1992. *Golden fetters : the gold standard and the Great Depression, 1919-1939*. New York-Oxford: Oxford University Press.

Eigner, Peter. 1994. "Interlocking directorships between commercial banks and industry in interwar Vienna." In *Universal Banking in the Twentieth Century, Finance, Industry and the State in North and Central Europe*, edited by Alice Teichova, T. R. Gourvish, Ágnes Pogány and P. L. Cottrell.

Aldershot, England, Brookfield, Vt: Edward Elgar.
Eigner, Peter. 1997a. "Bank-Industry networks: the Austrian experience, 1895-1940." In *Rebuilding the Financial System in Central and Eastern Europe, 1918-1994*, edited by P. L. Cottrell. Aldershot: Scolar.
Eigner, Peter. 1997b. "Die Konzentration der Entscheidungsmacht. Die personelle Verflechtungen zwischen den Wiener Grossbanken und Industriaaktiengesellschaften, 1895-1940." Universitat Wien.
Eigner, Peter. 2008. "In the Center of Europe: Vienna as a Financial Hub, 1873-1913." In *Finance and Modernization: a transnational and transcontinental perspective for the nineteenth and twentieth centuries*, edited by Gerald D. Feldman, Peter Hertner, Banking European Association for and History Financial. Aldershot-Burlington, VT: Ashgate.
Ellis, Howard S. 1939. "Exchange Control In Austria and Hungary." *The Quarterly Journal of Economics* 54 (1):1-185. doi: 10.2307/1882818.
Feinstein, C. H., ed. 1995. *Banking, currency, and finance in Europe between the Wars*. Oxford: Clarendon Press.
Feinstein, C. H. 1997. *The European economy between the wars*. Edited by Peter Temin and Gianni Toniolo. London-New York: Oxford University Press.
Feldman, Gerald, D. 1992. "Banks and banking in Germany after the First World War: strategies and defence." In *Finance and Financiers in European History, 1880-1960*, edited by Youssef Cassis. Cambridge-New York: Cambridge University Press Paris: Editions de la Maison des sciences de l'homme.
Fior, Michel. 2006. "The financial instability of transition economies during the 1920s: the European reconstruction and Credit-Anstalt insolvency." XIV International Economic History Congress, Helsinki.
Good, David F. 1984. *The economic rise of the Habsburg Empire, 1750-1914*. Berkeley - London: University of California Press.
Good, David F. 1994. "The Economic Transformation of Central and Eastern Europe in Historical Perspective: Main themes and issues." In *Economic transformations in Eastern Europe : legacies from the past and policies for the future*, edited by David F. Good. London New York: Routledge.
Good, David F. 1994. *Economic transformations in Eastern Europe : legacies from the past and policies for the future*. Edited by David F. Good. London - New York: Routledge.
Hertz, Friedrich. 1933. "The Economic Chaos in Central Europe." *The Contemporary Review* 143:326.
James, Harold. 1991. "Introduction." In *The role of banks in the interwar economy*, edited by Harold James, Håkan Lindgren and Alice Teichova. Cambridge: Cambridge University Press & Éditions de la Maison des Sciences de l'Homme.
James, Harold. 1992. "Banks and bankers in the German interwar depression." In, 263-282. Cambridge - New York: Cambridge University Press - Paris : Editions de la Maison des sciences de l'homme
James, Harold. 2002. *The end of globalization : lessons from the Great Depression*. 1st pbk. ed. ed. Cambridge, Mass. - London: Harvard University Press.
James, Harold, Håkan Lindgren, and Alice Teichova. 1991. *The role of banks in the interwar economy*. Edited by Harold James, Håkan Lindgren and Alice Teichova. Cambridge: Cambridge University Press & Éditions de la Maison des Sciences de l'Homme.
Jonker, Joost, and Jan Luiten Van Zanden. 1995. "Method in the Madness? Banking Crises between the Wars, an International Comparison." In *Banking, Currency, and Finance in Europe between the Wars* edited by C. H. Feinstein. Oxford: Oxford University Press.
Kaser, Michael, and Rudolf Nötel. 1987. "Kelet-Európa gazdaságai a két világválságban (Eastern

European Economies in Two World Crises)." In *Válság, recesszió, társadalom : Az 1930-as és az 1970-1980-as évek összehasonlítása : Válogatott tanulmányok*, edited by Iván T. Berend and Knut Borchard. Budapest: Közgazdasági És Jogi Kiadó.
Kaser, Michael, and Lisanne Radice. 1985. *The Economic history of Eastern Europe 1919-1975. Vol.1, - Economic structure and performance between the two wars*. Edited by Michael Kaser and Lisanne Radice. Oxford: Clarendon.
Kaser, Michael, and Lisanne Radice. 1986. *The economic history of Eastern Europe, 1919-1975. Vol.2, Interwar policy The War and reconstruction*. Edited by Michael Kaser and Lisanne Radice. Oxford: Clarendon Press.
Kindleberger, Charles Poor. 1986. *The world in depression, 1929-1939*. Rev. and enl. ed. ed. Berkeley: University of California Press.
Komlos, John. 1990. *Economic development in the Habsburg monarchy and in the successor states : essays*. Edited by John Komlos. Boulder: New York: East European Monographs - New York : Distributed by Columbia University Press.
Krugman, Paul. 1979. "A Model of Balance-of-Payments Crises." *Journal of Money, Credit and Banking* 11 (3):311-325.
Krugman, Paul. 1999. "Balance Sheets, the Transfer Problem, and Financial Crises." *International Tax and Public Finance* 6 (4):459-472. doi: 10.1023/A:1008741113074.
League of Nations. Secretariat. Financial, Section, and Service Economic Intelligence. *Commercial banks*. Vol. 1935.II.A2. Geneva: League of Nations.
Marcus, Nathan. forthcoming. *Credibility, Confidence and Capital: Austrian reconstruction*: Harvard University Press.
März, Eduard. 1984. *Austrian banking and financial policy*. London: London : Weidenfeld and Nicolson.
März, Eduard. 1990. "Die große Depression in Österreich 1930-1933." *Wirtschaft und Gesellschaft-WuG* 16 (3):409-438.
Mosser, Alois. 1994. "Financing industrial companies in interwar Austria: working capital and liquidity." In *Universal Banking in the Twentieth Century, Finance, Industry and the State in North and Central Europe*, edited by Alice Teichova, T. R. Gourvish, Ágnes Pogány and P. L. Cottrell. Aldershot, England-Brookfield, Vt: Edward Elgar.
Mosser, Alois, and Alice Teichova. 1991. "Investment behavior of industrial joint-stock companies and industrial shareholdering by the Osterreichische Credit-Anstalt: Inducement or obstacle to renewal and change in interwar Austria." In *The Role of Banks in the Interwar Economy*, edited by Harold James, Håkan Lindgren and Alice Teichova. Cambridge: Cambridge University Press & Éditions de la Maison des Sciences de l'Homme.
Nötel, Rudolf. 1974. "International Capital Movements and Finance in Eastern Europe 1919-1949." *Vierteljahrschrift für Sozial- und Wirtschaftsgeschichte* 61:65-112.
Obstfeld, Maurice. 1997. *The Great Depression as a watershed : international capital mobility over the long run*. Edited by Alan M. Taylor and Research Centre for Economic Policy. London: Centre for Economic Policy Research.
Reinhart, Carmen M., and Carlos Vegh. 1999. Do exchange rate-based stabilizations carry the seeds of their own destruction? edited by Munich Personal RePEc Archive.
Rothschild, Kurt W. 1947. *Austria's economic development between the two wars*. London: London : Muller.
Rudolph, Richard Lawrence. 1976. *Banking and industrialization in Austria-Hungary : the role of banks in the industrialization of the Czech Crownlands, 1873-1914*. Cambridge: Cambridge University Press.
Schubert, Aurel. 1991. *The Credit-Anstalt crisis of 1931*. Cambridge England-New York: Cambridge University Press.
Schubert, Aurel. 2008. "Torn between Monetary and Financial Stability: an Analysis of Selected

Episodes of Austrian Central Banking History." In *Finance and Modernization: a transnational and transcontinental perspective for the nineteenth and twentieth centuries*, edited by Gerald D. Feldman and Peter Hertner. Aldershot - Burlington, VT: Ashgate.

Stiefel, Dieter. 1983. "The Reconstruction of the Credit-Anstalt." In *International Business in Central Europe, 1918-1939* edited by A. Teichova and P. L. Cottrell. Leicester: Leicester University Press.

Stiefel, Dieter. 1987. "A Nagy Válság egy kis országban. Az 1930-as évek gazdasági világválsága Ausztriában - mai tanulságokkal." In *Válság - recesszió - társadalom*, edited by Iván T. Berend and Knut Borchard. Budapest: Közgazdasági És Jogi Kiadó.

Stiefel, Dieter. 1994. ""For better, for worse…": the Credit-Anstalt and its customers in 1931." In *Universal Banking in the Twentieth Century, Finance, Industry and the State in North and Central Europe*, edited by Alice Teichova, T. R. Gourvish, Ágnes Pogány and P. L. Cottrell. Aldershot, England-Brookfield, Vt: Edward Elgar.

Stiefel, Dieter. 2008. "The Bankers' View: Austria's Economic and Political Development and the Role of Banks." In *Finance and Modernization: a transnational and transcontinental perspective for the nineteenth and twentieth centuries*, edited by Gerald D. Feldman, Peter Hertner, Banking European Association for and History Financial. Aldershot-Burlington, VT: Ashgate.

Teichova, Alice. 1994. "Continuity and Discontinuity." In *Economic transformations in Eastern Europe : legacies from the past and policies for the future*, edited by David F. Good. London-New York: Routledge.

Teichova, Alice, and P. L. Cottrell. 1983. "Industrial structures in West and East Central Europe during the interwar period." In *International business and Central Europe, 1918-1939*, edited by Alice Teichova and P. L. Cottrell. Leicester, Leicestershire] : New York: Leicester, Leicestershire : Leicester University Press - New York : St. Martin's Press.

Teichova, Alice, T. R. Gourvish, Ágnes Pogány, and P. L. Cottrell, eds. 1994. *Universal banking in twentieth century Europe : finance, industry and state in north and central Europe*. Aldershot, England - Brookfield, Vt: Edward Elgar.

Teichova, Alice, and Herbert Matis, eds. 1996. *Österreich und die Tschechoslowakei 1918-1938 : die wirtschaftliche Neuordnung in Zentraleuropa in der Zwischenkriegszeit*. Wien: Böhlau.

Weber, Fritz. 1991a. "Universal Banking in Interwar Central Europe." In *The role of banks in the interwar economy*, edited by Harold James, Håkan Lindgren and Alice Teichova. Cambridge: Cambridge University Press & Éditions de la Maison des Sciences de l'Homme.

Weber, Fritz. 1991b. "Vor dem grossen Krach. Die Krise des österreichischen Bankwesens in den zwanziger Jahren." Universitat Salzburg.

Weber, Fritz. 1995. "From Imperial to Regional Banking: the Austrian Banking System, 1918-1938." In *Banking, currency, and finance in Europe between the Wars*, edited by C. H. Feinstein. Oxford: Clarendon Press.

Weber, Fritz. 2008. "The Creditanstalt form the 1870s to the 1930s." In *Finance and Modernization: a transnational and transcontinental perspective for the nineteenth and twentieth centuries*, edited by Gerald D. Feldman, Peter Hertner, Banking European Association for and History Financial. Aldershot-Burlington, VT: Ashgate.

Weber, Fritz, and Eduard Marz. 1983. "The Antecedents of the Austrian Financial Crash of 1931." Vol. 103 (Issue 5):497-519

Wessels, Jens-Wilhelm. 2003. "Economic Performance and Micro-Economic Development in Austria, 1929-1938." In *The Dollfuss/Schuschnigg Era in Austria: a reassessment*, edited by Günter Bischof, Anton Pelinka and Alexander Lassner. New Brunswick, N.J.: New Brunswick, N.J.: Transaction Publishers.

WIFO. 1965. Österreichs Volkseinkommen 1913 bis 1963. edited by Österreichisches Institut für Witschaftsforschung (WIFO).

ARCHIVAL SOURCES

Bank of England Archive (BoE Archive)
Files OV28/1, 2, 3, 4, 5 - Austria: Country file
Files OV28/32, 33, 34, 35 – Austria: Österreichische Nationalbank
File OV28/44 – Austria: Advance by the Bank of England to the Austrian Government
File OV28/69 – Austria: Credit-Anstalt Reconstruction
File OV28/75 – Austria: Credit-Anstalt – Cross Deposits
File C48/413 – Austria – Credit-Anstalt

Archive of the Austrian National Bank (ANB Archive)
Mitteilungen des Direktoriums der Österreichischen Nationalbank, 1922-1931 (ANB Mitteilungen)
Generalrats Protokolle, 1925-1931

OTHER DATA SOURCES

Compass Finanzielles Jahrbuch, 1926-36
Statistische Nachrichten, 1925-32
Statistisches Handbuch, 1923-35
Monatsberichte – Österreichisches Institut für Wirtschaftsforschung (WIFO)
Statistical Year-book of the League of Nations, 1927-33