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THE ROLE OF CAPITAL ADEQUACY RELATIONS IN A PERIOD OF CRISIS - SWEDISH BANKING 1915-1935

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Abstract

This paper analyses the introduction and use of capital adequacy requirements in Swedish commercial banking during the period 1915-1935. From an international perspective, we can see regulation was introduced comparatively early in Sweden with the Bank law of 1911 which aimed to ensure economic stability in the banks. The regulation meant that banks could not accept deposits in excess of five times the sum of their share capital and funds. This paper analyses the effects of this regulatory change for a range of different banks. How were capital adequacy rules designed, and how did banks of different sizes react to their introduction? Were there any alterations to the capital adequacy requirements, and if so, how did the banks react to these? The analysis is based on Swedish commercial banks' annual and monthly reports, which was gathered by the Bank Inspection Board and published by the Swedish Central Statistical Office. The database includes all Swedish commercial banks, but a selection of banks has been done to analyse different problems during the interwar period.

The role of capital adequacy regulations in a period of crises – Swedish banking 1915-1935

Mats Larsson

Introduction

The question of capital adequacy requirements has occupied a central position in debates about the right way to achieve international standards and for managing risk in commercial banking. To develop a revised framework, a more risk-sensitive system for asset evaluation has been put forward during the last decades – a system that in many ways resembles the Swedish system from the 1970s. During the first two decades of the 20th century the first guidelines for capital adequacy requirements were formulated in Swedish banking legislation. In this paper, I analyse the effects of this legislation for individual banks, whilst discussing the function of capital adequacy requirements more generally.

Few markets, if any, have been subjected to the same degree of regulation as the financial market. Financial regulations have often developed as an extension of established norms and market practices. Legislation and tradition have therefore developed interactively, but sometimes path dependency is apparent. Nevertheless, even in markets with long-term institutional stability, situations can occur when the financial system is modified, to a greater or lesser degree, and new guiding principles are introduced. These regime changes may embrace both institutional and organisational change.[1] They may respond to macro-economic developments, such as fluctuating real estate prices

[1] Llewellyn (2001).

and government finance, or they may be related to other social changes, such as unemployment, or low rates of economic growth.[2]

To make regime changes acceptable to financial actors, regulations need to be adjusted to the general situation of the market. If the rules are seen to be obsolete, the risk of opportunistic behaviour increases, and actors will find a way to circumvent the regulation. Alternatively, the financial intermediaries may co-operate in order to force the government to alter the regulations. Earlier research has shown how interest-groups mounted resistance when regime changes threatened the banks.[3]

This paper focuses on an important regime change in the history of Swedish banking: the introduction of the new banking legislation in 1911. The introduction of this piece of legislation was followed by a formative period, when banks modified and adjusted their activities in order to adapt to the new law. Among other things, the new banking legislation meant that commercial banks could own, and trade in, shares in their own names. This was an important step, especially for the larger commercial banks, since it opened the possibility for them to assume the role of universal banks. However, as the freedom of commercial banks increased, more detailed regulations appeared, which aimed to safeguard their financial stability.

One important new regulation concerned capital adequacy requirements. This meant that banks could not accept deposits in excess of five times the sum of their share capital and funds. This paper analyses the effects of this regulatory change for different types of banks. How were capital adequacy rules designed, and how did banks of different sizes react to their introduction? Were there any alterations to the capital adequacy requirements, and if so, how did the banks react to these?

The rise of inflation during the Great War made it difficult for banks to maintain their capital adequacy requirement. To address this the Swedish Government acted unexpectedly. In 1917, the

[2] Forsyth & Notermans (1997).
[3] Llewellyn (2001); Forsyth & Notermans (1997); and Larsson (1998).

Government temporarily withdrew this regulation for larger banks – those with a sum of share capital and funds in excess of 5 million Swedish crowns (SEK) – while the requirements were maintained for smaller banks. In the early 1920s, and to a lesser extent in the early 1930s, Swedish banks were hit by banking crises, resulting in substantial losses which led to several banks being restructured. Could these crises have been anticipated by the Bank Inspection Board if capital adequacy requirements had been studied more carefully? Can we find any systematic pattern that shows how the unlimited liability banks (ULBs) and limited liability banks (LLBs) coped with the capital adequacy regulation.

Speculation and crisis in the Swedish economy

In the 19th century Swedish commercial banking had been organized in two different ways. There were joint-stock banks, with limited liabilities, and banks with unlimited liabilities. The first commercial bank in Sweden was founded in 1830 and was soon followed by others. It was, however, only the growth of industrial production in Sweden during the latter part of the 19th century that ushered in private banking on a larger scale. Banks founded prior to the 1860s were so called private (*enskilda*) banks, based on shares. The owners were liable – one for all, all for one – for meeting the obligations of the bank. Issuing banknotes was a prime function of these banks, and initially there was little interest in deposit banking. But *Stockholm's Enskilda Bank*, founded in 1856, did develop an interest in deposit banking, which led other banks to increase their deposits in turn.

When new bank legislation was introduced 1864, however, Swedish banking started to develop rapidly. This new law made it possible to establish joint-stock banks with limited liability and, over the course of the 1860s and 1870s, several new banks were set up. These banks could not issue their own banknotes: their operations were based on the share capital, funds and deposits from clients. As the 19th century drew to a close, the right for joint-stock banks with unlimited liability to issue their own banknotes was gradually curbed and was finally withdrawn in 1903.[4]

Alongside these new approaches to industrial finance, the stock market began to grow in importance.[5] The breakthrough for the Stockholm Stock Exchange came in 1901, when trading was reorganized, which was followed by the rapid development of market capitalization. In the years that

[4] Söderlund (1978).

[5] Broberg (2006).

followed, trading on the stock market were given a further boost when the banking institutes were allowed to register on the Exchange.[6] As the trade in shares increased, the purchase of shares for speculative purposes became increasingly common. The real boom for speculation, however, did not arrive until the 1910s.

During the Great War, Sweden's foreign trade grew, and profits in industry increased, largely as an effect of high inflation rates. Inflation led to growth in the value of real estate and machinery, which further stimulated the economy. The anticipation of growth in the market value of shares in industry, fuelled speculation and new companies started to be funded by trade on the stock exchange. Commercial banks played a crucial role in this development. They helped new companies list shares on the stock market through affiliated investment companies (*emissionsbolag*), a move which lead to the structural transformation of the Swedish industrial base.[7]

The strength of the Stockholm stock market was clear from the number of new companies listing shares and the growing volume of trade—which, in real terms, would not be exceeded until in the 1980s. The ease with which shares could be traded on the open market made this a better system of financing – in comparison to issuing of bonds for example. The level of interest rates on new bonds was regarded as too high, especially towards the end of the 1910s.[8]

Inflation heightened speculation on Sweden's financial market during the Great War, with private speculators, industrial companies and banks pursuing profitable returns. However, towards the end of the War the market started to fluctuate, then share prices stagnated, and by the early 1920s this had become a crisis.[9]

International deflation, manifest during the summer of 1920, reached Sweden with full force that autumn. The declining price of shares was exacerbated by the monetary policy of the Government,

[6] Hägg (1988): Larsson et al (2016).
[7] Östlind (1945), Larsson & Lönnborg (2014)
[8] Östlind (1945).
[9] Larsson (1998).

which aimed to restore the Swedish Krona to the gold standard. The official discount rate was increased, and the state budget was squeezed: all measures that fuelled the flames of deflation. Then, in the course of the twenties, several industrial companies were restructured and, since many of the commercial banks had invested in them, they suffered as a result. Commercial banks sustained heavy losses on outstanding loans, and in some cases, their funds were used to absorb losses in order to continue trading. Additional capital was supplied through capital contributions from shareholders, but some banks were acquired by more solvent competitors.

Commercial banks had a strong interest to avoid bank failures where depositors' capital might be lost, since this could lead to a bank panic and severe problems for the financial system. So, where the bank owners either could not, or would not, contribute more capital to shore up a bank, some of the larger commercial banks underwrote the capital of banks in difficulty to avoid plunging the banking sector into deeper crisis. In the early of years of the crisis cooperation between banks helped to save the Swedish banking system. But in March 1922 *Sydsvenska Kredit AB* reported severe losses, and it became clear that not even a consortium of the large banks would be able to save the company. Instead, the State Central Bank acted as lender of last resort in order to secure the banking system. A special institute, *AB Kreditkassan* was established, jointly funded by the Central Bank and the commercial banks, in order to transfer capital to banks that were experiencing difficulties. During the next few years, *AB Kreditkassan* played a major role in the reconstruction of commercial banks with solvency and liquidity problems.[10] Capital transfers to these banks could be handled in three basic ways: as a means of guaranteeing shares issued by the new banks that had been established to acquire the business of failed banks; as loans made on the proceeds of recently issued shares; and, by clearing debts and other obligations from the assets of banks in crisis.[11]

Eight commercial banks were particularly hard hit by the financial crisis of the early 1920s. At least five of them would have found it difficult to survive without support from *Kreditkassan AB*:: *Smålands Enskilda Bank, Wermlands Enskilda Bank, Sydsvenska Kreditaktiebolaget, Svenska Lantmännens Bank* and *Nordiska Handelsbanken*. The reconstruction of the other three banks, *Mälarprovinsernas Bank, Kopparbergs Enskilda Bank* and *Handelsbanken*, was achieved through the

[10] Hagberg (2007).
[11] Larsson (1992). Östlind (1945).

support of the three of the largest banks, *Stockholms Enskilda Bank, Skandinaviska Kreditaktiebolaget* and *Göteborgs Bank* (see Table 1).[12]

Table 1. Crises in commercial banks in Sweden, reconstructed by external capital during the 1920s and 1930s crises

Commercial bank	Initiation of reconstruction	Reconstruction with support of
Mälarprovinsernas Bank	February 1922	Skandinaviska Kreditaktiebolaget
Kopparbergs Enskilda Bank	February 1922	Skandinaviska Kreditaktiebolaget /Göteborgs Bank
Sydsvenska Kredit -aktiebolaget	March 1922	Kreditkassan
Smålands Enskilda Bank	October 1922	Stockholms Enskilda Bank, Kreditkassan
Handelsbanken	October 1922	Stockholms Enskilda Bank/Skandinaviska Kreditaktiebolaget
Wermlands Enskilda Bank	April 1923	Skandinaviska Kreditaktiebolaget/ Stockholms Enskilda Bank/Kreditkassan
Svenska Lantmännens Bank	April 1923	Kreditkassan
Nordiska Handelsbanken	September 1925	Kreditkassan
Skandinaviska Kreditaktie- Bolaget	March 1932	Kreditkassan

Sources: SOS, Uppgifter om bankerna 1922–1925; Östlind (1945).

[12] A more detailed description of the reconstruction of Swedish commercial banks in the 1920 is given in Larsson (1992) and in the Swedish language by Östlind (1945) and Hagberg (2007).

Beside these banks, the dominating *Skandinaviska Kreditaktiebolaget* also incurred large losses. When the need to depreciate the value of loans was presented in December 1922, the Bank Inspection Board estimated that the bank's evaluation of it losses was far too low. In order to avoid a large bank failure, the Social Democratic Government presented the bank with a proposal of joint ownership, shared between the State and the private investors. The Board of *Skandinaviska Kreditaktiebolaget* had mixed feelings about this proposal. Although a potential advantage of going for joint ownership was that it might have strengthened the bank in relation to its competitors, especially *Handelsbanken,* which already had received a similar proposal, *Skandinaviska Kreditaktiebolaget* reached the decision to use increasing profits to avoid the government partnership, a course that Handelsbanken also had adopted.[13]

From 1924 onwards during the latter half of the twenties, the Swedish economy experienced renewed growth. Several of the structural problems in Swedish industry that were germane to the 1920s crisis were resolved, and this gave the economy an edge compared to other countries. Thus, when the international economy experienced the after-effects of the Wall Street Crash 1929 both Swedish banks and the Swedish economy were comparatively unaffected. The most dramatic failure followed the suicide of Ivar Kreuger and the subsequent collapse of the Kreuger business empire which resulted in large losses for the *Skandinaviska Kreditaktiebolaget*, which had granted substantial loans to the Kreuger Group. But, compared to other countries, the Swedish financial system never experienced the same shockwave of commercial bank failures, as for example United States.[14] Compared to the 1920s, when the banking crisis primarily developed through national problems, the crisis of the 1930s had its origins in the international economic situation. Apart from *Skandinaviska Kreditaktiebolaget* there were no major problems for the Swedish commercial banks, and with the loans from *Kreditkassan*, also this bank managed to re-establish their business.

Risk reduction through banking legislation

In Sweden, the need for tougher regulation of commercial banks had been discussed at the close of the 19th century, as had the possibility that commercial banks might begin to acquire shares. Then, around

[13] Söderlund (1978).
[14] Larsson & Lönnborg (2014).

1910, there had been further discussions between representatives from banks as well as in the Swedish Parliament. When the new bank legislation was adopted in 1911, it covered also direct regulations of banks business. With the right to share acquisition the business opportunities for commercial banks was increased, but at the same time this meant that the depositors´ capital became more exposed to risk than before.

The risks connected with commercial banking were managed through three types of regulations:

Share capital and reserve fund requirements. The share capital (basic fund)[15] was, from 1912, to amount to at least one million SEK, unless the charter of the company stated that banking activities would only be conducted at the 'local level'. In this case, the basic fund could be reduced to 500 000 SEK, a small increase from the earlier minimum amount of 200 000 SEK. This may have contributed to the closure, after a transitional period, of banks with low reserves of capital. Bank mergers were facilitated by regulations which made it easier to acquire shares in other banks.[16] The ensuing concentration of Swedish commercial banking was quite astonishing. In 1910, there were 81 commercial banks, but within ten years this number had almost halved, to 41 banks, and after the crisis, in 1925, there was only 31 banks in operation.[17]

In addition to regulations regarding share capital, capital was to be set aside every year in a reserve fund. At least 15 per cent of the annual profits of a bank, after the deductions to cover the previous year's deficits had been made, were to be placed in the reserve fund. These provisions were to be made until the reserve fund amounted to a total of 50 per cent of the share capital, but of course it could continue beyond this point. However, the reserve fund could be allowed to fall below the 50 per cent limit to cover losses.[18]

[15] The correct name would be basic funds and for limited liability banks this would be the same as the share capital. In unlimited liability banks the terminology share capital was not used since the ownership did not include any limited responsibility for the banks business. However, to make this text easier to read and since there were no difference between share capital and basic funds from a finance perspective, share capital has been used throughout the paper.
[16] SFS 1911:74. Söderlund (1978).
[17] Jungerhem & Larsson (2014)
[18] SFS 1911:74

Cash reserve requirements. In order to ensure the short-term stability of the banks, new liquidity requirements were introduced in the 1911 banking law. According to this regulation, commercial banks were obliged to keep a cash reserves in the form of assets that could easily be converted into money. Together with the cash account, the cash reserve was to amount to at least 25 per cent of the commitments that the company was obliged to honour upon demand. This was, of course, an attempt to stabilise the liquidity of banks in the case of a run on the bank. Another method of preventing bank runs was to use deposit accounts with periods of notice, such that deposits could not be withdrawn before for example two weeks.[19]

Capital adequacy requirements. The concern for private savings resulted in new rules which regulated the size of the total deposits a bank could hold. Thus, deposits were not allowed to exceed five times the amount of the bank's share capital and own funds, that is, the sum of the reserve fund and the free reserves. This was a simple and unsophisticated construction of a capital adequacy requirement, and probably not much more than a formal confirmation of existing banking practice. But it was probably one of the first – if not <u>the</u> first – effort to introduce a capital adequacy regulation for commercial banks in Europe. However, in May 1917, banks with share capital and funds in excess of five million SEK were relieved from the obligation to maintain a level of deposits at five times the amount of the bank's share capital and funds.[20]This decision was motivated by the substantial increase in deposits after 1916 and was to remain in effect until further notice.

Thus, while the requirements were abandoned for the larger banks, the regulations of 1911 remained in force for the smaller banks. Even if concern for private deposits lay behind this decision, it seems clear that it accentuated the structural changes that had already begun within commercial banking. The regulation was prolonged one year at a time until January 1921. This meant that for more than four years larger banks had the possibility to expand their deposits as much as they wanted. But when problems started to mount in the banking sector, new limitations were introduced for the larger banks, from January 1st, 1921. According to the new regulation, commercial banks with share capital and funds larger than five million SEK could accept deposits to the amount of 25 million SEK plus nine

[19] SFS 1911:74

[20] SFS 1917:199.

times the difference between the banks' own funds and five million SEK. The upper limit for deposits was set at eight times the banks' total funds.[21]

These three measures: share capital and reserve funds; cash reserve; and capital adequacy requirements provided the basis for maintaining economic stability in commercial banking after 1911. While the regulation of cash reserves was hardly a problem for the banks – there was no bank run in Sweden during this period – both the size of the share capital, and the capital adequacy requirements, were of fundamental importance for the long-term survival of both the banking system and individual commercial banks. The funding of banking and the requirements on capital were closely related, meaning that a reduction in the size of funds could easily result in an overdraft of the capital adequacy ratio.

The capital adequacy regulations of 1911 were designed to stipulate minimum requirement levels of capital. If banks wanted to hold capital in excess of what was required, this was of course possible. This left the banks with a strategic decision to make whether to hold more capital than required, or whether to simply adhere to the regulated level. It is important to analyse this choice from both a short and a long-term perspective. We could expect that banks, in the long term, would prioritise stable growth and stable profits, while in the short term, banks were likely more interested in generating maximum profits.

However, there may have been differences between large and small banks, since large banks had access to more information than their smaller competitors and could therefore make more accurate risk assessments. The larger business volume in big banks made it easier to handle large and medium-sized risks. Thus, it is necessary to distinguish between large and small banks in order to discover possible differences in their adopted strategies.

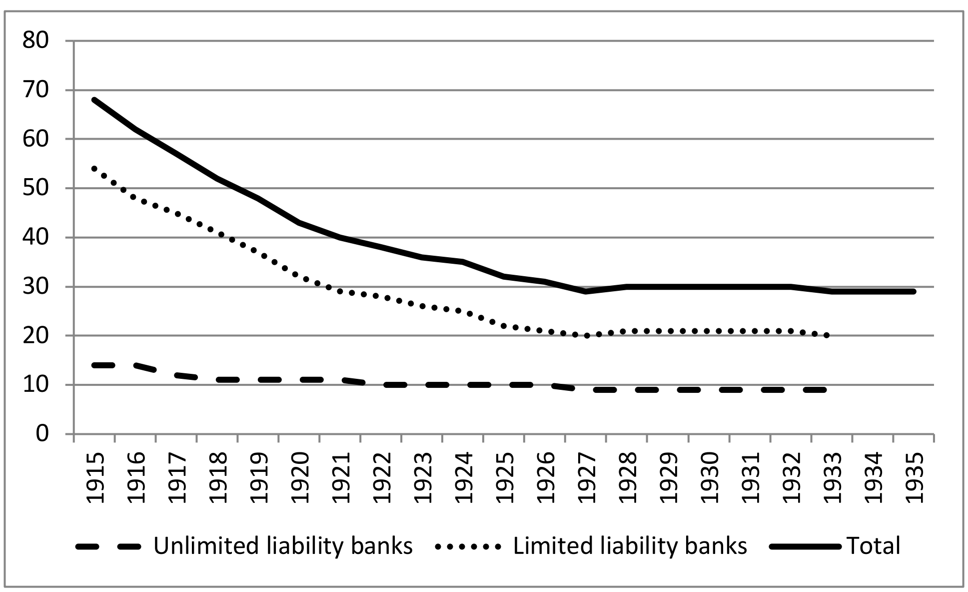
The structure of the commercial banking industry, 1915-1935

The official bank statistics from 1912 divided banks into different categories related to ownership structure and the banks' size, assets and turnover. The first category was comprised of commercial banks which had owners with unlimited liability for the bank's business – ULBs. Until 1903, these banks had the

[21] SFS 1920:210.

right to issue their own banknotes. The second category consisted of limited liability banks, or LLBs, which had been established after 1864. The third category, like the second, consisted of LLBs, but with smaller capital resources of less than 1 million SEK. Within this last group of banks were the so called 'peoples banks' (*folkbanker*) and other smaller LLBs.

Of the 66 banks that were active in 1915, there were 15 ULBs, holding 31 percent of the total assets in commercial banking. The 31 largest LLBs, with more than 1 million Swedish Krona in share capital, held 48 percent of the total assets in commercial banking. The remaining 21 banks only held 2 percent of total assets. In 1933 – the last year of ULBs[22] – the smaller LLBs had either merged with larger banks or been liquidated, and the remaining LLBs (21) held 64 percent of commercial banks assets, while the nine remaining ULBs held 36 per cent of total assets.[23] Thus, the number of commercial banks had been significantly reduced, while the ratio between ULBs and LLBs remained fairly stable. Figure 1. shows the structural development during the period and the total number of banks involved in the study. The structural changes were especially large during the period 1915-1925 with a sharp drop in the number of commercial banks. This was mainly the result of a large number of mergers, which resulted in the concentration of banking in the four largest banks.



[22] According to new regulation after the Kreuger crash all ULBs had to be reorganised to LLBs, but they were allowed to retain their original name.
[23] SOS, Uppgifter om bankerna 1915 & 1935.

Source: SOS Uppgifter om bankerna 1915–1935

Figure 1. Number of commercial banks in Sweden 1915-1935 categorized into ULBs and LLBs

Note: The ULB were abolished in 1934 and were reorganized as LLBs.

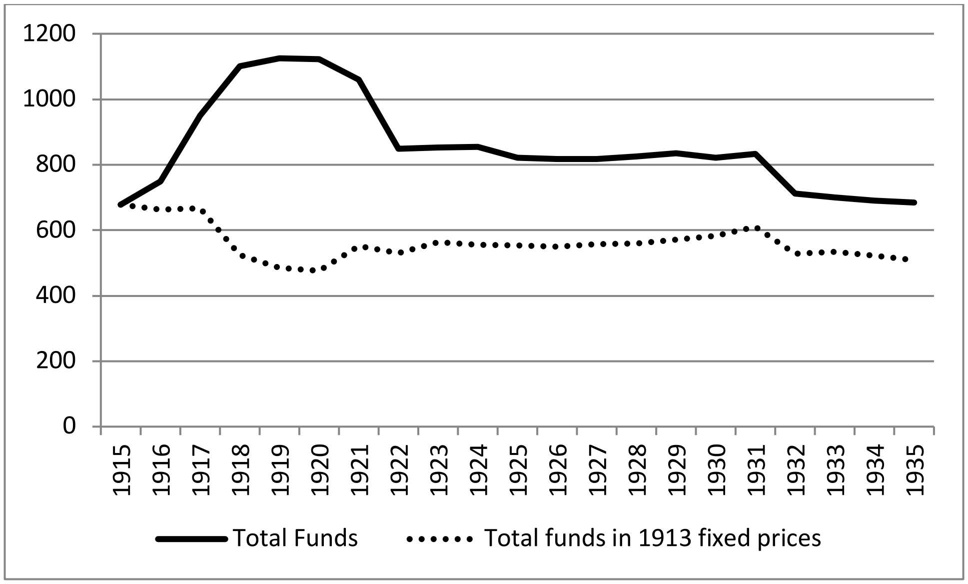
The financial boom during latter part of the 1910s saw a large number of bank mergers. These were, to a significant extent, driven by an effort to increase deposits and consolidate specific geographical markets. Mergers continued in the 1920's, but for other reasons. The economic problems curbed banking acquisitions, but as the banking market slowed down and the need for restructuring became the prime mover behind structural changes. [24]

ULBs showed a better survival ratio than LLBs, both during the crisis, and in the years preceding it. This was to a great extent an effect of the large size of these banks but may also be explained by their organizational form and the effect of personal ownership, since personal responsibility probably contributed to a more risk-averse approach to avoid personal losses.

The size of funds

In 1916, the share capital and funds of commercial banks started to increase, mostly due to the level of inflation, which peaked in 1919/1920. In fixed prices, the effects of the inflation during the Great War is clear (see Figure 2). Compared to 1915-1917, the commercial banks' share capital and funds fell with 1/3 in real terms until 1920. The deflationary years of 1920-1922 resulted in a sharp drop in the value of funds expressed in current prices, hence also in the bank's possibility to accept deposits. But at the same time, the value of the funds increased in real terms. The rest of the 1920s was a period of slow recovery in the value of funds, but in 1931 total funds fell, both in real and nominal terms.

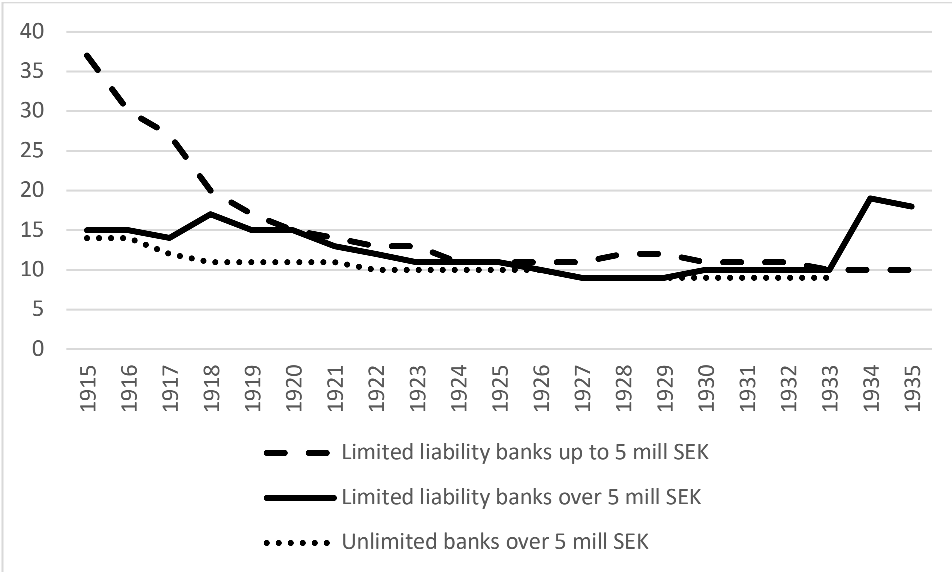
[24] Jungerhem & Larsson (2014)



Source: SOS, Uppgifter om bankerna 1915–1935

Figure 2. Share capital and funds for all commercial banks 1915-1935 in million SEK

Notwithstanding the economic development in Sweden together with the organisational structure of the banks might have drained funds from the banks. In the case of the ULBs the owners were responsible for the all of the bank's liabilities. Obviously, this did not encourage risk-taking in lending but instead promoted a focus on general safety and stability in business. This notion is supported by the development of the level of share capital and funds held by the bank during the period of analysis. Thus, during the inflationary years of the 1910s, share capital and funds did not increase as fast as in the LLBs. However, two banks – *Kopparbergs Enskilda Bank* and *Upplands Enskilda Bank* – stood out with rapidly increasing share capital and funds from 1916 to 1921. *Upplands Enskilda Bank* as well as *Stockholms Enskilda Bank* managed to keep funds at a high level during the deflationary period in the early 1920s, while *Kopparbergs Enskilda Bank* struggled to keep the funds at an adequate level to retain its deposits – but the bank finally had to merge with *Göteborgs Bank* in 1922. It is obvious that even though some middle-sized banks, with share capital and funds over 5 mill SEK, were forced to merge during the late 1910s and early 1920s, the major part of the structural change affected the smaller banks (see figure 3).



Source: SOS, Uppgifter om bankerna 1915–1935

Figure 3. Number of commercial banks distributed according to ownership organisation (ULBs & LLBs) and size of share capital and funds 1915-1935

Note: All ULBs had share capital and funds larger than 5 mill SEK

In general, it was probably easier to attract capital to an LLB than to an ULB, and this might have promoted the development of funds in the LLBs. One might presume that these banks were exposed to greater risk, given that they used their funds to increase deposits, in comparison to banks that did not develop as fast. However, it is also possible that larger funds helped to stabilize the banks during the 1920s crisis.

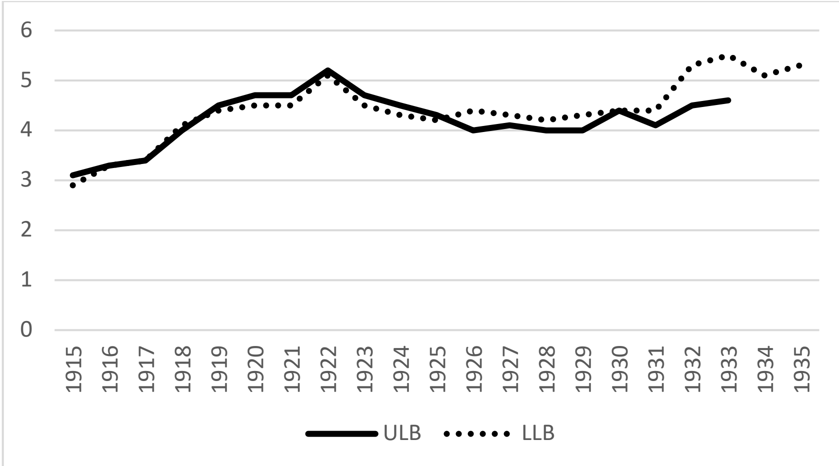
Both the LLBs and the ULBs where able to maintain their funds at much the same level during the deflationary crisis, with only minor reductions to funds. This suggests that either loan losses were met with the capital held by banks, or through contributions from the share owners, or with hidden reserves. It is clear that the banks that were most heavily hit by the crisis had to reduce their funds sharply in order to solve their economic problems. During 1922/23 seven banks in crisis (see Table 1.) were forced to use their funds to cover losses. Funds were built up to be used in the event of economic difficulty, and there are examples when these funds were large enough to solve such problems. However, a reduction of funds is usually a clear indicator of economic problems. In order to understand the security system for Swedish commercial banks, we must look more closely at how the capital adequacy requirements were implemented.

The function of the capital adequacy regulation

The banks' monthly statistics contain different types of short- as well as long-term deposits. By dividing the total deposits with the sum of share capital and additional funds we get a ratio that can be compared with the stipulated capital adequacy level.

For the study of the capital adequacy regulation, a smaller sample of commercial banks have been selected. All banks with an active business for five years or more during the period 1915-1935 have been selected. This means that among the ULBs only a few banks that merged with competitors have been omitted. In the case of the LLBs fewer banks have been chosen for this analysis. Since a large part of the smaller LLBs were liquidated or merged during the late 1910s after less than five years of business during the period of analysis, these have been omitted. The selected banks are presented in Table 2 and Table 3. Banks with a deposit/share capital + funds ratio between 5 and 7.9 are coloured in yellow, while ratios of 8 and higher are coloured in red. This reflects changes in regulation when banks with share capital and funds higher than 5 million SEK in 1917 were allowed to increase their deposits without limitations (yellow) a when the ratio restriction of 8 was introduced as the highest ratio in 1921 (red).

An overall comparison between the ULBs and LLBs shows a small shift in the deposit/share capital + funds ratio around 1925. During the latter part of the 1910s, the ratio developed in a similar way for both types of banks. But in the early 1920s, the ratio was slightly higher for the ULBs. However, in the middle of the 1920s, the situation changed as the ratio for LLBs was higher than for the ULBs (see Figure 4). The difference between the two bank types increased during the 1930s, primarily as an effect of a reduction of the LLBs funds during the Kreuger crash. Aside from the first half of the 1930s, the deposit/share capital + funds ratio developed in remarkably similar way for ULBs and LLBs despite a strong inflation period and a serious bank crisis. In general, there does not seem to have been any significant difficulty for maintaining deposits within the capital adequacy regulations. Thus, the changes in the capital adequacy regulations that were made in 1917 and 1921 probably did not have any decisive importance for the bank system, but it may have been crucial for individual banks.



Source: Calculations based on SOS, Uppgifter om bankerna 1915-1935

Figure 4. Deposits in relation to share capital and funds (ratio) for ULBs 1915-1933 and LLBs 1915-1935

Thus, it is important to look at the way different banks responded to the capital adequacy regulations. *Kopparbergs Enskilda Bank* experienced capital adequacy problems as early as 1917, and in the following year four other banks; *Östergötlands Enskilda Bank*, *Smålands Enskilda Bank*, *Enskilda Banken Vänersborg* and *Skaraborgs Enskilda Bank*, were unable to maintain the original capital adequacy requirements (see Table 2). This continued in the early 1920s, with the largest ratios in the years 1921-1927, when five out of ten ULBs displayed capital requirement ratios higher than 5. By 1918, four of eleven ULBs had increased their deposit/share capital and fund ratio to 5 or higher. All ULBs had share capital and funds that were larger than 5 million SEK.

Table 2. Deposits in relation to share capital and funds for ULBs 1915-1935

	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935	Merged with
Värmlands Enskilda Bank	3.4	4.0	3.8	3.8	4.3	4.8	4.5	4.5	8.2	7.3	8.6	6.0	5.8	5.5	5.4	5.6	5.3	5.4	5.7	5.5	5.5	
Koppabergs Enskilda Bank	3.7	4.1	5.3	3.3	3.8	4.0	4.0	M														Göteborgs Bank
Östergötlands Enskilda Bank	4.4	4.3	4.5	5.0	5.6	5.5	5.6	5.3	7.4	6.6	8.1	5.8	4.5	4.5	4.4	4.4	4.1	5.5	5.5	5.5	5.3	
Norrköpings Enskilda Bank	2.3	3.2	3.8	3.5	3.8	3.9	3.6	3.4	2.9	2.9	2.9	2.9	M									Östergötlands Enskilda Bank
Smålands Enskilda Bank	4.6	4.5	3.9	5.8	6.4	6.9	6.7	8.8	7.5	7.1	8.7	6.5	6.5	6.3	6.2	6.2	6.0	6.2	6.1	5.8	5.6	
Södermanlands Enskilda Bank	2.4	2.9	3.8	4.1	4.3	4.6	5.0	5.0	4.8	4.6	4.5	4.5	5.3	4.9	5.0	4.9	5.5	5.1	6.9	6.3	8.2	
Stockholms Enskilda Bank	2.5	3.6	3.2	3.9	4.6	4.1	3.4	3.4	3.3	3.1	3.0	2.5	2.7	2.6	2.5	2.7	2.6	3.1	3.2	3.4	3.7	
Sundsvalls Enskilda Bank	2.5	2.8	2.2	2.6	3.0	3.4	3.4	3.8	3.6	3.5	3.4	3.5	3.6	3.6	3.7	3.9	3.7	3.7	3.7	3.1	3.6	
Enskilda banken i Vänersborg	5.4	4.1	4.4	6.3	6.2	6.5	6.6	6.3	5.8	5.5	5.2	5.2	5.2	5.2	5.3	5.2	5.3	5.1	7.1	6.8	6.6	
Skaraborgs Enskilda Bank	4.0	4.4	4.2	6.2	7.1	7.5	7.5	7.4	6.6	6.5	6.1	6.0	6.0	5.8	5.9	5.8	5.8	5.7	7.5	7.1	7.1	
Upplands Enskilda Bank	3.6	3.8	3.3	4.0	4.6	4.9	4.8	4.7	4.3	4.2	4.6	4.1	4.3	4.2	4.3	4.3	5.8	5.3	5.5	5.4	6.1	

Source: Calculations based on SOS, Uppgifter om bankerna 1915-1935

Note: Banks with deposits five times or higher than the banks' share capital and funds (the general regulation of deposit size) is marked with yellow, and banks with deposits eight times or more than the banks' share capital and funds is marked with red. Three ULBs have been omitted, since they were only active during a few years of the period; *Borås Enskilda Bank* merged with *Bank AB Södra Sverige* in 1917, *Hälsinglands Enskilda Bank* merged with *Mälarprovinsernas Bank* in 1917 and *Örebro Enskilda Bank* merged with *Skandinaviska Kreditaktiebolaget* in 1918. From 1934 unlimited liability banks were re-organized to limited liability banks.

Between 1922 and 1925 there were three banks that experienced problems with the new capital adequacy requirements with a ratio of 8 – *Värmlands Enskilda Bank, Östergötlands Enskilda Bank*, and *Smålands Enskilda Bank*. This was directly connected to the banking crisis. There was a small reduction in deposits during the crisis years, that can be associated with the general economic downturn and the increase in unemployment. But for many banks, the level of deposits continued to be high during the 1920s. This indicates that the banking crisis did not fundamentally change the level of trust in commercial banks by the general public. From the middle of the 1920s through the middle of the 1930s, the capital adequacy ratios stabilized for the ULBs.

The LLBs, to a greater extent than ULBs, managed to meet the capital adequacy requirements of the 1911 banking law (see Table 3). This is not surprising, since the majority of small banks in Sweden were LLBs which made it relatively easy to raise the share capital. Even though most LLBs met the original capital adequacy requirements, some banks took advantage of the changes to the capital adequacy regulation in 1917 and in the years that followed. Among these banks was the second largest/largest commercial bank, *Handelsbanken*. This bank expanded fast between 1915 and 1925, largely through mergers with small and middle-sized banks meaning it obtained a large number of business offices. This resulted in *Handelsbanken* becoming the largest Swedish commercial bank. During the crisis of the first half of the 1920s, five other banks took advantage of the possibility to expand their deposits (see Table 3). In the case of *Mälarprovinsernas Bank, Svenska Lantmännens Bank, Sydsvenska Kreditaktiebolaget* and *Göteborgs Handelsbank*, the increased deposit/share capital + funds ratio was caused by reconstructions. Apart from Handelsbanken in 1925, the capital adequacy ratios of these banks were still within the limits stipulated by the law.

The size of deposits for smaller and medium sized LLBs did not, however, increase as fast. Both the development of funds and deposits indicate that the smaller banks, with local markets, did not play any active role in the development of the financial market in the 1910s, and this probably helped reduce the risks for these banks. Only a few of these banks had a capital adequacy ratio near five. Deposits at twice or three times the size of share capital and funds were much more common. However, these smaller banks were radically reduced in numbers during the period of analysis, either through mergers or liquidations. In 1917, there were 29 small banks (all LLBs) – with share capital and funds equal to or less than five million SEK. After the crisis in the 1920s, there were only 16 left and in 1935 only ten of them remained.

Table 3: Deposits in relation to share capital and funds for LLBs 1915-1935

	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935	Renamed to/merged with
Skandinaviska Kredit	3.0	3.4	3.0	4.1	5.1	4.9	4.8	4.2	3.6	3.4	3.0	2.9	3.0	2.8	3.0	3.1	3.1	2.6	4.2	4.6	4.8	
Handelsbanken	2.7	3.5	3.3	4.5	5.4	5.7	5.5	4.9	7.6	7.1	8.8	7.6	7.3	7.0	7.0	7.2	7.0	7.4	7.6	7.2	7.4	
Mälarprovinsernas Bank	2.5	3.1	4.6	4.2	4.5	4.5	4.1	4.1	R													Mälarbanken
Mälarebanken									7.0	6.3	5.9	5.3	M									Handelsbanken
Göteborgs Bank	2.9	3.8	2.2	4.5	4.6	4.6	4.5	5.5	5.0	4.6	4.6	4.7	4.8	4.8	4.8	4.8	4.8	5.1	7.0	7.5	7.9	
Göteborgs Folkbank	2.4	3.9	4.4	4.0	4.7	4.2	3.8	3.0	3.2	3.2	3.0	3.1	3.0	3.1	2.9	3.0	2.8	2.7	2.6	2.5	2.6	
Gotlands Bank	2.2	2.5	3.1	4.1	4.8	4.4	4.3	4.2	4.1	4.0	4.0	4.2	4.1	4.1	4.4	4.3	4.2	3.9	4.1	4.1	4.4	
Jämtlands Folkbank	4.5	4.9	4.4	3.9	4.6	1.7	1.7	4.3	4.0	4.3	3.5	3.6	3.6	3.6	3.2	3.5	3.1	3.0	2.9	2.9	2.7	
Örebro Folkbank	3.8	4.1	4.8	4.1	3.4	3.7	3.4	4.7	4.5	4.4	4.3	4.0	4.0	3.9	3.9	3.9	3.7	3.4	M			Södermanlands Enskilda Bank
Svensk Lantmännens Bank			1.4	3.7	4.5	5.1	4.3	3.9	R													Jordbrukarbanken
Jordbrukarbanken									3.3	3.7	4.7	5.7	5.9	6.1	5.3	4.8	4.9	5.8	5.6	5.8	6.9	
Syd-svenska Kreditab	5.0	4.8	5.0	5.5	4.6	4.5	3.8	4.7	R													Sydsvenska Banken
Sydsvenska Banken									4.3	4.0	4.0	3.7	3.7	3.5	3.5	3.7	3.6	3.4	5.9	5.7	M, R	Skånska Banken
Skånska Banken																					6.5	
Göteborgs Handelsbank	4.0	5.0	5.7	6.8	M			3.3	3.8	3.6	7.0	6.5	6.5	6.3	6.4	6.1	5,9	6.2	6.0	5.9	6.5	Nordisk Handelsbanken
Nordiska Handelsbanken					4.1	4.2	3.8	R														Göteborgs Handelsbank
Affärsbanken			0.6	0.8	0.7	0.8	0.8	M														Södermanlands Enskilda Bank
Nylands Folkbank	2.6	3.1	3.3	3.0	3.0	M																Sundsvalls Enskilda Bank
Bollnäs Folkbank	3.2	3.7	4.1	5.1	4.3	3.9	3.8	M														Sundsvalls Enskilda Bank
Hudiksvalls Kreditbank	2.7	2.4	3.6	4.2	3.2	M																Upplands Enskilda Bank
Ångermanlands Folkbank	2.5	3.0	4.1	3.0	3.7	4.1	M															Handelsbanken
Övre Västerdalarnas Bank				0.8	1.4	2.0	2.1	1.9	1.8	M												Göteborgs Bank
Jämtlandsbanken			0.4	1.1	1.7	1.7	1.4	M														Jämtlands Folkbank
Norrköpings Folkbank	3.3	3.7	2.9	3.6	4.3	4.4	4.4	4.6	4.3	4.3	4.4	4.9	5.3	4.8	5.2	4.3	4.2	4.1	4.3	4.2	4.2	
Luleå Folkbank	3.9	4.4	5.3	5.4	3.8	4.1	4.1	3.7	4.7	4.8	4.3	4.6	4.6	4.2	4.0	4.5	4.4	3.4	3.0	3.4	3.2	
Borås bank				0.6	1.2	1.6	1.4	1.5	1.5	1.5	1.8	2.2	2.0	2.4	2.6	2.8	2.6	2.6	2.5	2.7	2.8	
Kreditbanken					0.7	0.9	0.8	0.9	1.3	1.2	1.3	1.6	1.6	1.7	1.5	1.6	1.6	1.5	1.5	1.6	1.9	
Bank AB Norden						3.6	2.1	1.2	1.1	1.2	1.4	1.5	M									Södermanlands Enskilda Bank
Hjo Bank	1.7	2.1	2.9	2.3	2.5	2.5	2.5	2.3	2.0	1.9	1.9	1.9	1.9	1.9	1.8	1.9	1.8	1.7	1.9	1.7	1.6	
Sundsvalls Kreditbank	2.1	2.8	2.3	2.0	1.9	1.9	1.8	1.8	1.8	1.7	1.9	2.1	2.2	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.4	
Hallands Lantmannabank			1.9	3.6	4.2	4.3	4.0	3.4	2.9	M												Nordiska Handelsbanken
Nya Banken	2.5	4.5	3.8	3.1	3.6	L																
Bohusbanken					0.9	1.3	1.3	1.3	1.3	1.2	1.9	2.0	2.6	3.0	3.1	3.0	3.1	3.2	3.5	3.9	4.2	
M = Bank merged																						
R = Bank renamed																						
L = Bank liquidated																						

Source: Calculations based on SOS, Uppgifter om bankerna 1915-1935

Note: Banks with deposits five times or higher than the banks' share capital and funds (the general regulation of deposit size) is marked with yellow, and banks with deposits eight times or higher than the banks' share capital and funds is marked with red.

The development of the capital adequacy reflects the risks connected with banking. Small banks with a capital adequacy ratio between 1 and 2 of course had a much lower risk than banks with a ratio of over 5. This indicates that the aim of these small banks, to hold savings, was different from that of expanding middle-sized and large banks. But even banks with a high capital adequacy ratio did not necessary carry larger risks than the smaller banks, due to larger reserves and the structure of lending.

Banks in crisis – monthly changes

The annual reports of banks give us a broad picture of the long-term development of capital adequacy for banks, but this does not necessarily show us how the capital adequacy developed for banks during periods of crisis. However, with the help of monthly statistics it is possible to follow short-term changes in the banks' capital adequacy. In this part of the paper, I have chosen to focus on the five commercial banks that were reconstructed with the help of public support in the 1920s and *Skandinaviska Kreditaktiebolaget* in the 1930s (see Table 1).

During the spring of 1922 capital adequacy for *Sydsvenska Kreditaktiebolaget* gradually improved from 3.89 in January to 3 in June (see Table 4), thus well within the capital adequacy ratio of five.[25] At the same time, the bank incurred heavy losses on loans, this led to the need to use free funds as well as share capital to cover losses. However, the bank had to be reconstructed with public support. Total funds in the new *Sydsvenska Banken* were 34 million SEK compared to 62 million SEK for *Sydsvenska Kreditaktiebolaget*. Even though deposits decreased, the capital adequacy ratio was much higher than before the reconstruction.

Table 4. Changes in the Capital adequacy ratio of Sydsvenska Kreditaktiebolaget/ Sydsvenska Banken, 1922

January 1922	3.89
February	3.78
March	3.17
April	3.13
May	3.11
June	3.00
July	5.19
August	5.11
September	4.98
October	4.89
November	4.89
December	4.70

Source: Calculations based on SOS, Uppgifter om bankerna 1922

Note: Sydsvenska Kreditaktiebolaget changed name to Sydsvenska Banken in July 1922

[25] The reduction of the capital adequacy ratio was the result of falling deposits.

The problems for *Smålands Enskilda Bank* became obvious during the spring of 1922. Heavy loan losses, in combination with withdrawn deposits, led to liquidity problems which could not be solved without public support.[26] A reconstruction of the bank was carried out in October of 1922, resulting in the reduction of equity and funds from 18.9 million to 12.6 million SEK. At the same time, the capital adequacy ratio increased from 6.34 to 9.25 – thus considerably higher than the limit stipulated by the law (see Table 5). Since the reconstruction was financed and monitored by public authorities, this overdraft must have been officially accepted. The capital adequacy ratio was gradually reduced during late 1922 and 1923.

Table 5. Changes in the Capital adequacy ratio of Smålands Enskilda bank, 1922

January 1922	6.94
February	6.96
March	7.10
April	6.97
May	6.87
June	6.72
July	6.67
August	6.53
September	6.34
October	9.25
November	8.45
December	8.84

Source: Calculations based on SOS, Uppgifter om bankerna 1922

The economic problems of *Wermlands Enskilda Bank* became apparent during the summer of 1922. When the bank calculated its losses in the autumn of that year the sum came to 47 million SEK, equivalent to the value of the share capital and funds held by the bank. The reorganisation of the bank was carried out in January 1923 and resulted in a reduction of the bank's share capital and funds from 47.3 million to 22.2 million SEK. As the deposits increased, the capital adequacy ratio more than doubled

[26] Hagberg (2007), pp 159–162

from 4.45 to 9.58 (see Table 6). The capital adequacy ratio did not return to within the regulated limit until 1924. This was a consequence of the drop in the sum of share capital and funds due to credit losses.

Table 6. Changes in the Capital adequacy ratio of Wermlands Enskilda Bank, July 1922 – June 1923

July 1922	4.83
August	4.81
September	4.75
October	4.66
November	4.52
December	4.45
January 1923	9.58
February	9.54
March	9.41
April	9.26
May	9.09
June	8.80

Source: Calculations based on SOS, Uppgifter om bankerna 1922-1923

Svenska Lantmännens Bank never had any problems in keeping to the capital adequacy ratio (see Table 7). Compared to other commercial banks, this bank did not depend solely on deposits but on securing large loans from other banks. However, this led to the reconstruction of the bank in April of 1923. The volume of loan losses was even higher than the total funds held by the bank, and recapitalisation was only possible through public involvement. Share capital and funds were reduced from 23.6 to 20 million SEK, which had little effect on the capital adequacy ratio.

Table 7. Changes in the Capital adequacy ratio of Svenska Lantmännens bank/Jordbrukarbanken, 1923

January 1923	4.00
February	3.84
March	3.41
April	3.62
May	3.47
June	3.39
July	3.38
August	3.31
September	3.23
October	3.17
November	3.20
December	3.27

Source: Calculations based on SOS, Uppgifter om bankerna 1923

Note: *Svenska Lantmännens Bank* changed name to *Jordbrukarbanken* in April 1923

Nordiska Handelsbanken had begun to face economic problems in 1922 but had been able to solve them with the use of its own funds. In 1925, the bank experienced another phase of difficulty, but due to a lack of funds the situation had to be handled with public support.[27] In September of 1923 certain deposits held by the bank were taken over by *Sydsvenska Banken*, which resulted in a very low capital adequacy ratio (see Table 8). The reconstruction was performed in October of the same year and at the same time the name was changed to *Göteborgs Handelsbank*. The share capital and funds of the bank were reduced from 54.6 million to 20 million SEK and with a modest reduction of deposits, the capital adequacy ratio increased from less than 3 to over 7.

In none of these five examples could the capital adequacy ratios have been used to foresee economic problems. In fact, it became more difficult for the banks to abide by the capital adequacy requirements after their respective reconstructions, which were financed and monitored by a public organisation, as funds were used to cover losses. The new capital which was injected into the banks was

[27] Hagberg (2007), pp 157–158.

less than the capital that had been lost. It is important to note that none of the five banks had any problems in keeping with the stipulated capital adequacy requirements before their reconstructions.

Table 8. Changes in the Capital adequacy ratio of Nordiska Handelsbanken/Göteborgs Handelsbank, 1925

January 1925	3.69
February	3.66
March	3.58
April	3.53
May	3.51
June	3.56
July	3.53
August	3.54
September	2.92
October	7.33
November	7.25
December	6.99

Source: Calculations based on SOS, Uppgifter om bankerna 1925

Note: Nordiska Handelsbanken changed name to Göteborgs Handelsbank in October 1925

The government acted as lender of last resort in the 1930s when *Skandinaviska Kreditaktiebolaget* was granted credits to reconstruct its business after the Kreuger crash in March of 1932. When it became known that Ivar Kreuger had committed suicide several clients swiftly withdrew their deposits from the bank. However, this could be handled with the help of short-term capital supplied by the *Riksbank*, and what could have developed into a bank run was overcome within a couple of days. Since *Skandinaviska Kreditaktiebolaget* was the second largest bank in Sweden, this perfectly illustrates the proverb 'too large to fail'. The problems for *Skandinaviska Kreditaktiebolaget* were overcome within a couple of years and the loans were ultimately repaid. These economic problems had very little effect on the bank's capital adequacy ratio, both before, as well as after, the Kreuger crash.

Table 9. Changes in the Capital adequacy requirement of Skandinaviska Kreditaktiebolaget, 1931-1932

October 1931	3.31
November	3.20
December	3.08
January 1932	3.14
February	3.14
March	2.85
April	3.77
May	2.74
June	2.68
July	2.72
August	2.66
September	2.68

Source: Calculations based on SOS, Uppgifter om bankerna 1925

Conclusion

As stated above, the regulation of capital adequacy seems to have been the only restraining factor for risk taking by banks during the period 1915-1935. This paper has shown that the capital adequacy regulation was legitimized by banks as a respected regulation. There were very few violations of the regulation, but this may be explained by the abandonment of the deposit/share capital + fund ratio between 1917 and 1921. When the regulation was changed in 1917, many banks, especially the ULBs exploited the ability to accept greater deposits. The increase in deposits was, for obvious reasons, much higher in large banks than in small banks; large banks had the ability to attract larger amounts of capital than small banks since they had larger geographical coverage and were established in large cities.

Large banks were considered to be more stable by the government. This was made evident when changes were made to the regulation in 1917, which allowed banks with share capital and funds equal to or over five million SEK to increase their deposits without limitations. Small banks with funds below five million SEK were not covered by this change to the regulation. Thus, as small banks were considered to be less stable, they were forced to hold larger funds in relation to deposits than large banks. The higher amount of deposits in large banks, both for LLBs and ULBs, resulted in a pressure to invest and take higher risks, since holding large amounts of capital was not profitable. The pressure to invest forced banks into less stable markets that were very sensitive to business cycles, and into granting loans against shares as collateral, which eventually accelerated the economic downfall in 1921-1922. This conclusion is in line with Minsky's argument that inflation leads to financial crises when financial actors are forced to speculate.[28] From another reason smaller banks should be considered as stable, since the policy of several of these banks was to limit the deposits to slightly above the sum of share capital and funds.

Does this give us the ability to predict financial instability? Yes, perhaps, but it has not been possible to confirm that in this analysis. Banks like *Smålands Enskilda Bank*, *Kopparbergs Enskilda Bank* and *Wermlands Enskilda Bank* exploited the right to hold larger deposits after 1917, but they increased their equity and funds, and went on to experience problems in the ensuing crisis of the 1920's. However, these problems could not have been foreseen by looking at the ratio between deposits and share capital/funds. The economic difficulties of these banks rather seem to have been connected to their rapid business expansion, with lending going to less strong customers.

Since the majority of the LLBs were small, and only active on local or regional markets, they were little involved in speculation. If these small banks are omitted from the sample, we see no significant differences between LLBs and ULBs. Most large and some medium sized banks were active in increasing their share capital, funds and deposits, irrespective of whether they were LLBs or ULBs.

It is true that during crisis years, banks sometimes revealed high deposit/share capital + fund ratios before they started to experience economic difficulties. But this did not apply to all the banks. For example, *Svenska Lantmännens Bank* did not experience any large increase in this ratio before its reconstruction in 1923. In fact, the ratio had dropped considerably before the crisis, from its highest level in 1920. With share capital and funds of over 23 million SEK the deposits of this bank could have been eight times as high as its actual level in 1922. One reason for this was that the bank was more dependent on borrowed capital, rather than deposits, and extending loans to a broader customer base would prove unfavourable during the economic downturn of the 1920s. From a general point of view, this indicates that capital adequacy ratios cannot always be used as an indicator of economic problems but must be considered in relation to particular economic circumstances of each bank.

[28] Kindleberger (1989).

This tells us something about capital adequacy as an indicator of risk behaviour. Previous research has given us mixed results. Some research has been unable to prove that capital adequacy ratios can play an important role in predicting banking crises or guiding efficiency.[29] Other results, however, indicate that capital adequacy requirements could be effective, especially for smaller banks if they are properly monitored.[30] In our example, the capital adequacy ratio did not function as an early warning signal of economic difficulty, because it was ill-suited for the risks that were taken by the banks, and because of its unsophisticated construction.

We must consider the possibility that capital adequacy requirements can, in some situations, create new problems rather than solve old ones. If the mix of clients and the structure of lending is unfavourable, it does not really matter whether a bank fulfils the capital adequacy requirement or not. In fact, if the bank's capital adequacy ratio is within accepted limits, it can create a false sense of security which can lead to further risk taking. Such a situation might have occurred in 1917, when the capital adequacy regulation was withdrawn for larger banks. This must have sent a signal to these banks that the situation was under control, when in fact inflation and speculation demanded a more detailed and active control.

[29] Barth et al (2004).
[30] Beatty & Gron (2001). Fernandez & Gonzalez (2005)

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