Capital in Banking

An Analysis of the Role of Capital in British and Swiss Banking, 1830-1990

Simon Amrein

Thesis submitted for assessment with a view to
obtaining the degree of Doctor of History and Civilization
of the European University Institute

Florence, 10 December 2019

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I Simon Amrein certify that I am the author of the work *Capital in Banking* I have presented for examination for the Ph.D. at the European University Institute. I also certify that this is solely my own original work, other than where I have clearly indicated, in this declaration and in the thesis, that it is the work of others.

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Lucerne, 20 November 2019

Simon Amrein

Abstract

Capital in banking is a central pillar of financial regulation. In the wake of the last financial crisis, the low levels of capital have become a widely discussed topic. Historically, most of the decline of capital/assets ratios occurred already before the end of the First World War. The capital/assets ratio fell rapidly again during the Second World War, followed by a much slower decrease during the second half of the 20th century.

Focusing on the United Kingdom and Switzerland, the thesis critically assesses the evolution of capital ratios and the validity of the numbers used by the existing literature for the period from 1830 to 1990. It shows that undisclosed (hidden) reserves, shareholders' liability, and hybrid forms of capital (e.g. subordinated debt) must be considered when assessing capital adequacy. All three factors substantially alter published capital/assets ratios.

Based on archival material from regulators, supervisors, and banks, the thesis sheds light on three vital drivers of capital/assets ratios in the long run: ideas, wars, and regulation. I argue that the capital policies of banks in the 19th century were guided by informal conventions: The managers of the first joint-stock banks already had well-established ideas about the role of capital and its relationship with risk. These ideas on capital adequacy and how to manage banks and their risks became more nuanced over time. The two World Wars, however, fundamentally changed the perception of capital ratios in banking. Rapidly increasing government debt, of which banks held a substantial part, coupled with inflation and the absence of capital issuances during the wars, led to a sharp decline in capital/assets ratios.

Finally, I assess how bank capital was regulated over time, showing that banks were highly involved in the evolution of capital regulation, both in the United Kingdom and Switzerland, and therefore shaped their regulatory environments.

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Abbreviations

BankG	Banking Act (Bundesgesetz über die Banken und Sparkassen)
BankV	Banking Ordinance (Vollziehungsverordnung zum Bundesgesetz über die Banken und Sparkassen)
BBA	British Bankers' Association
BCBS	Basel Committee on Banking Supervision
BIS	Bank of International Settlements
bn	Billion
BNA	British National Archives
BOEA	Bank of England Archive
BSD	Bank Supervision Division [of the Bank of England]
C/A ratio	Capital/assets ratio
CCC	Competition and Credit Control
CHF	Swiss franc
CLCB	Committee of London Clearing Bankers
DM	Deutsche Mark
EEC	European Economic Community
FBC	Federal Banking Commission
FINMA	Swiss Financial Market Supervisory Authority
G10	Group of Ten
GDP	Gross Domestic Product
HSSO	Historical statistics of Switzerland online
LMA	London Metropolitan Archives
m	Million
OECD	Organisation for Economic Co-operation and Development
p.a.	Per annum
Pp	Percentage points
RBSA	Archive of the Royal Bank of Scotland
RWA	Risk-weighted assets
SBA	Swiss Bankers Association
SBC	Swiss Bank Corporation (Schweizerischer Bankverein SBV / Société de Banque Suisse)
SFA	Swiss Federal Archives
SNB	Swiss National Bank
UBS	Union Bank of Switzerland (Schweizerische Bankgesellschaft SBG / Union de Banques Suisses)
UK	United Kingdom
US	United States of America

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1. Introduction

Banks play a vital role in economic development by providing credit to businesses and private households. Their lending activities on the asset side are financed via liabilities in the form of either debt or equity capital. Proportionally to the total assets, equity capital has experienced a major change since the 19th century: while the balance sheets of U.S. banks in 1850 consisted of 40% equity capital, this figure had dropped to about 7% by 2000. Similar declines can be observed in other countries, such as Germany, Switzerland or England.[1] Before and during the last financial crisis starting in 2007/2008, the equity capital to total assets ratio (capital/assets ratio) of large international banks dropped even lower, in some cases to below 3%.[2]

Interestingly, most of this decline had already taken place before the end of the First World War. During the interwar period, the capital/assets ratio recovered to some extent, only to enter yet another period of decline until the end of World War Two. What followed was a much slower decrease in the capital/assets ratio, which eventually stabilised at a low level, even in the face of a large-scale expansion of the banking sector from the 1970s onwards. This overall decline of the capital/assets ratio is well documented, but puzzling nonetheless: What can explain such a decrease in bank capitalisation? Why did it recover in certain periods?

The decrease of equity capital in proportion to the total assets is certainly a remarkable change in the way banks have funded their activities since the emergence of modern commercial banking in the 19th century. However, a high level of debt does not come as

[1] For Germany, see Deutsche Bundesbank, *Deutsches Geld- und Bankwesen in Zahlen, 1876-1975* (Frankfurt am Main: Knapp, 1976); Deutsche Bundesbank, 'Deutsche Bundesbank - Statistics', 2015 <http://www.bundesbank.de/Navigation/DE/Statistiken> [accessed 28 February 2015]. For Switzerland, see Adolf Jöhr, *Die Schweizerischen Notenbanken*: 1826-1913 (Zürich: Orell Füssli, 1915). Swiss National Bank, 'Historical Time Series', 2009. For England, see Mark Billings and Forrest Capie, 'Capital in British Banking, 1920–1970', *Business History*, 49.2 (2007), 139–62. and The Economist (various issues, 1861-1946). For the United States, see United States Bureau of the Census (1975) and Federal Deposit Insurance Corporation, 'Historical Statistics on Banking', 2015 <https://www2.fdic.gov/hsob/index.asp> [accessed 25 February 2015]; *Historical Statistics of the United States. Colonial Times to 1970*, ed. by United States. Bureau of the Census, 1975.

[2] To give a brief overview of capital/assets ratios of individual banks in 2008: The capital/assets ratio of Deutsche Bank was 1.6%: Deutsche Bank, *Annual Report 2008* (Frankfurt am Main, 2009), p. 50. The ratio of Credit Suisse was 2.8%: Credit Suisse, *Annual Report 2008* (Zürich, 2009), p. 187. The ratio of Barclays was 2.1%: Barclays Bank, *Annual Report 2008* (London, 2009), p. 34. and that of the Bank of New York Mellon 1.18%: Bank of New York Mellon, *Annual Report 2008* (New York, 2009), p. 95. The ratios are based on consolidated statements on group level.

a surprise. Granting loans and receiving deposits is one of a commercial bank's key functions, and deposits from customers are considered as debt capital. Thus, funding a bank with 'other people's money' is in the very nature of banking. Nonetheless, a certain level of capital is essential for individual banks and the whole financial system. It serves as an absorber of losses and can therefore affect a bank's default probability. Moreover, a sufficient amount of capital induces trust for depositors. Consequently, bank solvency can be – among other determinants – a crucial factor for financial market stability.

Capital adequacy has become a widely-discussed issue in the aftermath of the last financial crisis. The suggestions made by academics, regulators, and politicians in response to the question of 'how much capital is enough?' have ranged anywhere from one-digit percentages to 100%. This variety of opinions is underlined by arguments that promote financial market stability on the one hand and potential adverse economic effects via reduced credit supply or higher capital requirements on the other. The latter claim is often based on the argument that equity capital is more expensive than debt capital. Among the most prominent advocates of substantially higher capital requirements are probably Anat Admati and Martin Hellwig or John Cochrane, who even discusses the idea of '100% equity banking'.[3] Moreover, economists such as Charles Goodhart, or Andrew Haldane and Vasileios Madouros, argue that capital requirements under the Basel II framework were too low – the latter two authors arguing that most of the large international banks that defaulted or required government support during the last financial crisis had survived if their capital to assets ratio had been above a 7% threshold.[4]

Inherent to the disagreement over capital adequacy are diverging opinions on the role and relevance of capital in banking. In a historical perspective, the assessment of capital/assets ratios is even more complex. Indeed, the analysis of capital/assets ratios without considering a broad set of factors – ranging from the economic, political and regulatory environment to the risks of bank assets – is misleading. Additionally, the

[3] John H. Cochrane, 'The Grumpy Economist: Equity-Financed Banking', *The Grumpy Economist*, 2016 <http://johnhcochrane.blogspot.com/2016/05/equity-financed-banking.html> [accessed 22 February 2017]. Anat R. Admati and Martin Hellwig, *The Bankers' New Clothes: What's Wrong with Banking and What to Do about It* (Princeton: Princeton University Press, 2014).
[4] Charles A. E. Goodhart, 'Lessons for Monetary Policy from the Euro-Area Crisis', *Journal of Macroeconomics*, 39 (2014), 378–82. Andrew G. Haldane and Vasileios Madouros, 'The Dog and the Frisbee', in *Speech Presented at the Federal Reserve Bank of Kansas City's Jackson Hole Economic Policy Symposium*, 2012.

significance of these factors has changed over the course of the past two centuries, and with it the meaning of the capital/assets ratio.

Imagine a bank in the year 1850 with a primary focus on long-term lending to a few railway and industrial companies in an environment without a lender of last resort in times of crises and no deposit insurance scheme. The very same bank in 2019, now with a well-diversified loan portfolio, deposits insured up to a certain level and the ability to discount securities with the central bank, might still have the same capital/assets ratio as in 1850 – for example 10%. 10% in 1850 and 10% in 2019 are identical figures. The probability of this bank surviving in a crisis, however, might be very different in 1850 and 2019. To provide another example: if the capital/assets ratio were to decrease from 10% to 5% between 1850 and 2019, this would not necessarily reflect a more fragile financial system on an aggregated level, nor more risk-appetite on the single bank level. It might very well be the outcome of different economic, political, and regulatory realities. Thus, plotting one simple ratio in a chart going from the 19th to the 21st century is – admittedly – problematic. It is therefore the objective of this dissertation to provide a differentiated view on capital/assets ratios in the long run.

The existing literature in fields which most typically deal with banks' capital structure, such as corporate finance, does not address the historical evolution of capital ratios. Other strands of literature, such as that on banking crises, financialisation or discussions of regulation and financial market stability, frequently refer to the relative decline of capital over time, but also fail to elaborate on the historical context in which these changes occurred. Within the discipline of financial history, there are a small number of contributions providing a more thorough analysis of bank capital – most notably Richard Grossman and in the British context John Turner as well as Mark Billings and Forrest Capie.[5]

The vast majority of publications from different disciplines discussing bank capital refer to the very same time series covering capital/assets ratios on nationally aggregated level. These time series are often obtained from different sources and assembled. Moreover, key aggregates, such as capital, total assets, or even banks as entities, are often defined differently. Apart from outlining the deficiencies of such time series, the dissertation

[5] Richard S. Grossman, *Unsettled Account: The Evolution of Banking in the Industrialized World since 1800*, Princeton Economic History of the Western World (Princeton NJ: Princeton University Press, 2010). John D. Turner, *Banking in Crisis: The Rise and Fall of British Banking Stability, 1800 to the Present*, Cambridge Studies in Economic History (Cambridge: Cambridge University Press, 2014). Billings and Capie, *Capital in British Banking*.

therefore also uses data on the level of individual banks that have been collected from annual reports, published accounts in magazines and newspapers, as well as archival material from regulators and commercial banks.

The starting point of the research period is broadly the first half of the 19th century, when many commercial banks were established to provide credit for industrial companies and large infrastructure projects or to finance trade. The period under examination lasts until 1988. With such a long timeframe, it is difficult to provide an in-depth analysis with a global perspective. Instead, the research focuses on particular countries, topics, and periods. The thesis presents nationally aggregated datasets on bank capital for Germany, Switzerland, the United Kingdom, and the United States. The more detailed analysis focuses on specific events and periods in the United Kingdom and Switzerland. The aim of this approach is to cover the topic on a broad level and in a very long perspective, while still ensuring detailed research on the level of individual banks, their supervisors, and regulators. By choosing the United Kingdom and Switzerland for an encompassing analysis, two of the most relevant financial centres of the 20th century are included. Furthermore, the United Kingdom represents a financial system that is financial market-oriented, whereas Switzerland's financial system stands in the tradition of a bank-oriented market.

The thesis contributes to the ongoing discussions about financial market stability, banking regulation and capital requirements. While speaking to present-day debates, the thesis is rooted in historical context. Low capitalisation has resurfaced in the wake of the last financial crisis; however, as will be shown in the following, it is not at all a new issue, but rather a subject of discussion ongoing since the very beginning of modern banking in the 19th century. Simple rules of thumb on capital adequacy existed already when new banks were established in the 19th century. And several banking crises had already spurred discussions about bank capital, in some cases even leading to the regulation of capital.

Methodologically, the thesis uses both quantitative and qualitative approaches. The historiographical account is supported by descriptive statistics. Undoubtedly, one of the major challenges of this thesis has been its long-term perspective. Since the emergence of commercial banking in the 19th century, the financial system has fundamentally changed. Monetary regimes have been transformed, ranging from the classic gold standard to periods of strict capital controls to the managed float regimes of the present. Similarly, the regulatory environment has undergone profound changes, marked by an

acceleration of financial regulation from the 1930s onwards, and increased deregulation in the last third of the 20th century, which coincided with the ever-growing role of finance in the economy.

The thesis is structured as follows: Chapter 1 introduces the topic, outlines the methodology, and discusses the sources and literature. Chapter 2 provides some theoretical views on bank capital. Chapter 3 shows the evolution of capital/assets ratios on a nationally aggregated level for Germany, the United Kingdom, the United States, and Switzerland. It also provides a concept that takes into account the structural changes in the balance sheets over time and discusses the deficiencies of such long-run time series. Chapters 4 to 6 focus exclusively on the United Kingdom and Switzerland, each examining specific periods. Chapter 4 analyses the capital/assets ratios up until the outbreak of World War I. It emphasises the influence of ideas and conventions on capital ratios. Chapter 5 covers the periods of the two World Wars. Both wars led to a rapid expansion of government debt, of which substantial parts were held by banks. Moreover, high inflation rates diminished the real value of the paid-up capital and banks were formally or informally restrained from issuing new capital. Chapter 6 focuses on the role of banking regulation and supervision. It discusses the impact of regulatory changes on capital/assets ratios and shows how and why capital regulation was changed over time. A conclusion will be provided in Chapter 7.

1.1. Literature Review

Literature on bank capital is sparse and abundant at the same time. On the one hand, little has been written on the long-term evolution of bank capital and especially its potential determinants from the perspective of financial history. On the other hand, there are numerous publications from other disciplines that address the topic of bank capital directly or indirectly. These disciplines range from economics to corporate finance, law and political science. Publications in these areas are often concerned with topics such as the stability of banks and the financial sector, banking regulation or the role of banks within the economy. In this context, capital/assets ratios are often only one of many underlying issues.

The following paragraphs in this section introduce the financial history literature dealing with capital/assets ratios. Another significant stream of literature – corporate finance and its discussion of the ‘optimal capital structure’ – will be outlined in Section 2.4, as it

provides some theoretical insights into the incentives for having low or high capital/assets ratios.

The International Perspective

Several authors have addressed the topic of capital/assets ratios on both a national and an international level. Aiming to explain the change in the capital/assets ratio, Richard Grossman analyses nationally aggregated data for twelve countries from 1834 to 1939.[6] The panel data regression shows that banking crises, measured with dummy variables, have a significant positive impact on the capital/assets ratio. The author attributes this to the slow adjustment of capital in times of crises, whereas total assets contract comparably faster. The overall economic risk, proxied by using government bond rates, had a significant negative impact on the capital/assets ratio. Grossman finds that deposit insurance schemes, lender of last resort functions, and the introduction of capital requirements (using dummy variables) are statistically not significant. The author provides a more extensive analysis of capital, its determinants, and capital regulation in his book on the history of banking in the industrialised world since 1800.[7] With regards to the determinants of capital, Grossman stresses the argument that banking crises triggered higher capital requirements.[8] Apart from the impact of crises, Grossman emphasises the increased overall banking stability, with the maturing of commercial banking and the evolution of its business models. As banks developed, informational frictions were reduced and lowered the risks of the banking business over time, which contributed to the overall downward trend of the capital/assets ratios.[9]

Anthony Saunders and Barry Wilson compare the capital/assets ratios of banks in Canada, the United Kingdom, and the United States.[10] They show that the decline of the capital/assets ratios in Canada and the United Kingdom between 1900 and 1920 coincided with the consolidation and diversification of the banking sector. In contrast to the United Kingdom and Canada, the decline of the capital ratios in the United States

[6] Richard S. Grossman, 'Other People's Money: The Evolution of Bank Capital in the Industrialized World', in *The New Comparative Economic History: Essays in Honor of Jeffrey G. Williamson*, ed. by Jeffrey G. Williamson and others (Cambridge, MA: MIT Press, 2007). See also Grossman, *Unsettled Account*, p. 145ff. The analysed countries are: Australia, Belgium, Canada, Denmark, Finland, Germany, Italy, Japan, Norway, Sweden, United Kingdom, United States.
[7] Grossman, *Unsettled Account*.
[8] Grossman, *Unsettled Account*, p. 149.
[9] Grossman, *Unsettled Account*, p. 150.
[10] Anthony Saunders and Berry Wilson, 'The Impact of Consolidation and Safety-Net Support on Canadian, US and UK Banks: 1893–1992', *Journal of Banking & Finance*, 23.2 (1999), 537–571.

took place only after the 1930s. Saunders and Wilson relate the falling capital/assets ratios in the United States to the introduction of deposit insurance.

Oscar Jordà, Björn Richter, Moritz Schularick and Alan Taylor provide so far the most extensive dataset on capital/assets ratios, covering 17 advanced economies from 1870 to 2013.[11] Their data shows that capital/assets ratios declined substantially up until the Second World War. The average ratio of the 17 countries then remained relatively stable in the second half of the 20th century. The authors observe a brief increase of capital/assets ratios after 1970. Then the trend reversed slightly at the beginning of the 2000s. The authors discuss possible determinants of capital/assets ratios referring to existing literature. Based on their empirical analysis, Jordà et al. argue that high capital requirements cannot prevent financial crises. The paper also shows that capital ratios are poor crises indicators. Nevertheless, the authors highlight that higher capital ratios reduce the depth of recessions after a crisis. Thus, higher capital ratios might not increase the resilience of banks but can be beneficial from a macroeconomic point of view.[12]

The National Perspectives

Mark Billings and Forrest Capie have provided an extensive study of capital in British banking from 1920 to 1970.[13] Their work is based not only on published accounts but also on archival research in British banks. The authors estimate the extent of hidden reserves, which can also be considered as a form of capital. Billings and Capie compiled their data from the archives of Barclays Bank, Lloyds Bank, Martins Bank, Midland Bank, National Provincial Bank, and Westminster Bank. The two authors show that hidden reserves led to substantially higher internal capital/assets ratios than those based on published accounts. On average, the internal capital/assets ratios were 61% higher than the ratios based on published accounts. After 1970, British banks had to disclose their hidden reserves. With regards to regulation, the authors point out that capital was unregulated during the entire period. The Bank of England was mostly concerned with liquidity, through which it influenced and controlled the banks.[14]

[11] Òscar Jordà and others, *Bank Capital Redux: Solvency, Liquidity, and Crisis* (National Bureau of Economic Research, March 2017) <http://www.nber.org/papers/w23287>.
[12] Jordà and others, *Bank Capital Redux*, p. 34.
[13] Billings and Capie, *Capital in British Banking*. See also Forrest Capie and Mark Billings, 'Profitability in English Banking in the Twentieth Century', *European Review of Economic History*, 5.3 (2001), 367–401. for a discussion of profitability in English banking.
[14] Billings and Capie, *Capital in British Banking*, p. 155.

In contrast to Grossman, Billings and Capie do not aim to explain the change in the capital/assets ratios. However, they highlight crucial moments in the evolution of capital in British banking. Among them are the introduction of limited liability, adopted by many banks only after the collapse of the City of Glasgow Bank in 1878, and the amalgamation period until 1918. The mergers themselves contributed to lower capital ratios. At the same time, the banking market became substantially more concentrated. Moreover, the authors also consider implicit guarantees by the Bank of England and emphasise changes in the asset structure in the form of higher liquidity in certain situations. Finally, Billings and Capie also highlight the role of the Second World War and inflationary conditions.[15]

Apart from Billings and Capie, John Turner has contributed to the discussion on the British context with a chapter on bank capital and the effects of shareholder liability on banking stability. Turner also emphasises the influence of mergers and high inflation. In addition, he discusses possible explanations for falling capital ratios, such as the increased intrinsic stability of banks as a result of their growth, and better risk diversification, resulting from mergers and geographic expansion.[16] The better diversification argument had already been used as a justification for mergers during the amalgamation movement, as will be shown in Section 5.2.3.

For Switzerland and Germany, there are no recent studies discussing bank capital in a historical perspective. In the case of Switzerland, Thomas Husy argued in 1946 that the credit portfolio of large commercial banks had become increasingly better diversified, which allowed for lower capital/assets ratios. Moreover, Husy emphasised the strong demand for credit in periods of rapid economic growth which could not be financed to such an extent by new stock issuances. He further suggested that the demand for higher bank profitability had driven capital/assets ratios down. Additionally, he argued that banks issued new stocks only in periods of high profitability, which provided them with the necessary leeway to keep dividend payments stable.[17]

In 1981, Carl-Ludwig Holtfrerich discussed various hypotheses for the declining capital/assets ratios in Germany. First, Holtfrerich argued that the periods of high inflation from 1914 to 1923 and 1936 to 1945 had a negative effect on capital ratios. Secondly,

[15] Billings and Capie, *Capital in British Banking*, pp. 143, 155.
[16] Turner, *Banking in Crisis*, pp. 131, 136.
[17] Thomas Husy, *Die eigenen Mittel der schweizerischen Banken*, Betriebswirtschaftliche Studien (St. Gallen: Fehr, 1946), pp. 29–41.

the impact of inflation was further amplified by the increasing concentration of the German banking market. Third, non-cash payments became increasingly popular from the 1890s to the beginning of the First World War. The increased amount of non-cash payments gave banks more freedom to grant loans because their liquidity position improved. According to Holtfrerich, more non-cash payments allowed banks to reduce both capital and liquidity ratios. Finally, government bonds were considered as low-risk investments. During war and periods of high inflation, the German government became the biggest borrower. Since the perceived risk decreased, the banks would be required to hold less capital.[18]

Meanwhile, Allen Berger, Richard Herring and Giorgio Szegö have addressed the topic of capital/assets ratios by focusing on the United States.[19] In a study from 1995, the authors elaborated on why banks are required to hold capital from a corporate finance perspective and provided a historical overview showing the capital/assets ratio of US commercial banks from 1840 to 1943. The authors argued that the emergence of money markets, the establishment of clearinghouses, and asset diversification all lowered the default probability of banks, which led to lower capital requirements as an insurance against default. Moreover, they suggest that the National Currency Act and the National Banking Act in 1863/1864, the establishment of the Federal Reserve in 1914, and the creation of the Federal Deposit Insurance Corporation (FDIC) increased confidence in the safety net, which therefore allowed banks to hold less capital.[20]

Moving north across the border, Michael Bordo, Angela Redish and Hugh Rockoff have analysed why Canada was comparatively less prone to banking crises than the United States, arguing that the structure and performance of the two banking systems are path-dependent and a product of the institutional structures laid out in the 19th century. Bordo et al. attribute the stability of Canada's banking market to its higher market concentration as well as its tighter regulation. The Canadian banks were comparatively more leveraged, despite higher capital requirements. According to the authors, the key difference in the last financial crisis was that an important part of the US banking system

[18] Carl Ludwig Holtfrerich, 'Die Eigenkapitalausstattung deutscher Kreditinstitute 1871-1945', in *Das Eigenkapital der Kreditinstitute als historisches und aktuelles Problem: 6. Symposium zur Bankengeschichte am 24. Oktober 1980 im Hause der Commerzbank in Frankfurt am Main.*, ed. by Institut für bankhistorische Forschung e.V, 1981, pp. 19–21.
[19] Allen N. Berger, Richard J. Herring, and Giorgio P. Szegö, 'The Role of Capital in Financial Institutions', *Journal of Banking & Finance*, 19.3 (1995), 393–430.
[20] Berger, Herring, and Szegö, *The Role of Capital in Financial Institutions*, pp. 401–3.

– the investment banks – was highly leveraged, whereas such extreme cases cannot be seen in the Canadian system.[21]

Finally, Eugene White provides an analysis of the capital requirements specified in the US Federal and State Laws in the dual banking system. White shows that the minimum capital requirements were dependent on the population size, highlighting that states were inclined to keep requirements below the requirements of the National Banking Act. Thus, the regulation of capital was also an important factor in promoting the growth of state banks and a tool for regulatory competition.[22]

The brief literature overview above indicates that there is a remarkably small number of articles and books discussing potential determinants of capital/assets ratios from a historical perspective. Grossmann's analysis is – to the author's knowledge – the only econometric study of the capital/assets ratio as a dependent variable in the very long run. It is a valuable contribution, as it conceptualises potential determinants of capital. At the same time, however, it offers opportunities for further development. Firstly, the literature analyses capital ratios at the national level. Therefore, important variations among banks as well as internal factors within banks (such as profitability or asset structure) are not captured. Secondly, capturing regulatory changes with dummy variables is unsatisfactory when incorporating several countries, especially as capital regulations vary from one country to another. Safety nets (deposit insurance, lender of last resort), for example, evolved over time and were not always formalised in legislation, but in some cases simply implicit guarantees by a central bank. Measuring such changes, as Grossman also emphasised, is difficult.[23]

To conclude, the existing literature on capital ratios provides several insights, shedding light on potential determinants of capital ratios.

- Government financing: The increase in available credit for the government had two effects. On the one hand, it increased the total assets (in the case that there was no redistribution within the asset side). On the other hand, the government was usually perceived as a low-risk investment, therefore requiring less capital. Government

[21] Michael D. Bordo, Angela Redish, and Hugh Rockoff, 'Why Didn't Canada Have a Banking Crisis in 2008 (or in 1930, or 1907, or …)?', *The Economic History Review*, 68.1 (2015), 218–43 (pp. 238–39).
[22] Eugene N. White, *The Regulation and Reform of the American Banking System, 1900-1929* (Princeton: Princeton University Press, 1983), pp. 14–23.
[23] Grossman, *Other People's Money*, p. 141.

financing was often mentioned to be very high in wartime and related to periods of high inflation. Moreover, high inflation also impacts the growth of balance sheets.

- Market concentration in banking: The relationship between market concentration and capital ratios is not described in detail by the literature. It is often argued that market concentration is the outcome of geographic expansion and therefore led to better loan diversification. Consequently, the concentration argument is one of lower credit risk, allowing lower capital ratios.
- Safety net: Components of the safety net, such as the lender of last resort function or deposit insurance, might have created moral hazard, which incentivised banks to lower their capital/assets ratios.
- Shareholder liabilities: Limited or even unlimited liability might have impacted the capital/assets ratios. Unlimited liabilities of shareholders might restrict the banks' risk appetite.
- Economic development: It has been argued that periods of high growth rates lead to high credit demand, increasing the total assets, with the growth in loans having to be financed on the liabilities side. Another topic often discussed is inflation, even though the exact effects on a bank's balance sheet are usually not explained.

Besides these factors, there remains a variety of issues that have been discussed either rarely or not at all as potential drivers of capital/assets ratios. Among them are issues such as the effect of crises on balance sheets (taking into account accounting standards), the importance of internal bank factors (e.g. management decisions, profitability), the effects of competition and collusion, the impact of capital regulation, or the role and influence of stakeholders (e.g. investors, employees, customers).

The existing literature remains mostly vague when it comes to providing well-founded arguments about and discussing the causalities of the declining capital asset ratios. Given the large number of potential determinants, which can also vary over time, and the complexity of considering such a topic over a long period, this is not surprising. Consequently, a historical analysis with a sole focus on capitalisation might help to shed light on the topic. Many of the topics that the previous literature has hinted at will be discussed in depth in the following chapters.

1.2. Research Question

This dissertation will be guided by the following question: Why have the capital ratios of commercial banks in Switzerland and the United Kingdom decreased since the emergence of such banks, from the 19th century to the present?

The term 'commercial bank' is broadly defined as a financial intermediary with the primary functions of receiving capital in the form of deposits, granting loans and/or investing money, and providing services to facilitate the settlement of financial obligations. For the purposes of this thesis, this is a working definition. It should be understood in a broad sense, mainly because the business models of banks changed over time and because banks operate in different financial systems. In terms of legal forms, the focus is on joint-stock banks. This restriction allows a certain consistency over time. Independent from the legal environment, the form of a joint-stock bank always requires a share capital, of which a part is usually paid up by the shareholders. A paid-up capital is not necessary for private banks, for example, or for mutual savings banks based on different legal forms.

Even among commercial banks, balance sheet structures are very diverse. The type of credit and its duration, for example, varies from bank to bank. Whereas the joint-stock banks in the United Kingdom focused on short-term investing, their continental counterparts in Germany and Switzerland also engaged in long-term investments in companies as well as in other types of credits. Moreover, most banks have developed from 'pure' borrowing and lending/investing activities in the 19th century to become global universal banks – also providing investment banking, asset management, and private banking services – in the 21st century. Pure investment (or merchant) banks, private banks, and other financial service providers are not within the scope of this study.

Geographic Focus

Geographically, the research focuses on the United Kingdom and Switzerland. For the general overview showing the evolution of capital/assets ratios, Germany and the United States are added. All four countries are home to important financial centres.[24] London and New York represent the major financial hubs of the 19th and 20th centuries. With

[24] For an overview of the hierarchy of international financial centres, see: Youssef Cassis, 'International Financial Centres', in *The Oxford Handbook of Banking and Financial History*, ed. by Youssef Cassis, Richard S. Grossman, and Catherine R. Schenk, Oxford Handbooks (Oxford: Oxford University Press, 2016); Youssef Cassis, *Capitals of Capital: A History of International Financial Centres 1780–2005* (Cambridge: Cambridge University Press, 2006).

Germany, the most significant economic power in continental Europe is included, whose economic strength is also reflected by the size of its banking sector and the financial hubs in Berlin and after 1945 Frankfurt. Switzerland is of interest as it was and still is home to large banks. Even though the absolute size of its economy is substantially lower than the other countries, Switzerland was already one of the major capital exporters in the world on per capita basis by 1913.[25] Fragmented into the financial hubs in Geneva and Zurich, the country became an internationally significant financial centre in the 1960s.[26]

Apart from the international significance of the financial hubs in the United Kingdom and Switzerland, there are further reasons for selecting these two countries for closer analysis. First of all, the financial system in the United Kingdom has traditionally been more market-based, whereas the Swiss system was and still is more bank-based. Hence, the two countries represent the more market-based model prevalent in the United States and the United Kingdom and the more bank-based Continental European and Japanese model.[27]

Secondly, the two countries are very different in terms of regulation of capital, and on a broader level have different legal traditions (common law vs civil law; see Chapter 6). There were approaches towards regulating banking in the United Kingdom between the 1820s and the 1870s. From 1844 to 1857, there was even a minimum capital requirement in place for banks, enacted under the Joint Stock Bank Act in 1844.[28] However, this proved to be a short and relatively unimportant intermezzo of banking regulation. Instead, the United Kingdom opted to regulate not banks, but companies. The shift towards corporate law instead of banking law was marked by the Company Acts in 1879, 1908, 1929, and 1967. It was not until 1979 that statutory banking regulation was introduced by the Banking Act.[29] The introduction of statutory banking legislation was implemented in the wake of Britain's secondary banking crisis as well as in the context of an increasingly international financial environment. The Banking Act of 1979 also

[25] Paul Bairoch, 'L'économie suisse dans le contexte européen: 1913-1939', *Schweizerische Zeitschrift für Geschichte*, 34.4 (1984).
[26] Youssef Cassis, 'Introduction: The Weight of Finance in European Societies', in *Finance and Financiers in European History, 1880-1960*, ed. by Youssef Cassis (Cambridge ; New York: Cambridge University Press, 1992), pp. 1–13 (p. 7).
[27] For an overview of bank-based vs market-based financial systems, see: Franklin Allen and Douglas Gale, *Comparing Financial Systems* (MIT Press, 2000).
[28] *Joint Stock Bank Act 1844*, *C. 113*, 1844.
[29] For an overview of these regulatory developments, see: Mark Billings and Forrest Capie, 'Transparency and Financial Reporting in Mid-20th Century British Banking', *Accounting Forum*, Financial accounting: Past, present and future, 33.1 (2009), 38–53.

required banks to hold an appropriate amount of capital (see Section 6.1 for a detailed analysis).

In contrast to the pace of legal change in the United Kingdom, Switzerland started to regulate banks much earlier on. The first attempts at banking regulation on a regional (Cantonal) level were made from the 1860s onwards.[30] The Federal Banknote Act introduced 1883 stipulated minimum capital requirements for note-issuing banks.[31] The Great Depression led to the introduction of the Federal Law on Banks and Savings Banks in 1934 (in the following: Banking Act) and the accompanying Banking Ordinance in 1935.[32] Both the Banking Act and the Ordinance were revised over time, but their structure and many essential articles are still in place today. The regulatory framework of 1934/1935 also introduced minimum capital and liquidity ratios.

The two countries also varied in the way in the practice of banking supervision. In the British system, the Bank of England supervised banks informally and without a legal mandate until 1979. In Switzerland, the introduction of banking legislation in 1934 established a supervisory agency, the Federal Banking Commission (FBC). Therefore, the two countries offer two interestingly different cases: a system based on informal supervision and statutory banking legislation only after 1979, and a system of statutory legislation with minimum capital requirements after 1934 and a mandated supervisor.

Third, the two countries differ in terms of both existing contemporary banking literature and academic literature. There is a rich and extensive literature on British banking history. Moreover, many ongoing publications emerged over time in Britain to discuss the evolution of the banking market and address theoretical and practical questions. Apart from the newspapers, examples are *The Economist* (first issued in 1843), *The Bankers' Magazine* (also 1843), or the *Journal of the Institute of Bankers* (1879). Additionally, there was already an established stream of banking literature in the form of books, often written by banking practitioners, in 19th century Britain (see Chapter 4).

In Switzerland, there were no periodic publications specifically on banking in the 19th century. Instead, the historiography for the 19th century has to rely mostly on publications from private persons interested in banks and statistics. For example, Christoph Bernoulli,

[30] See for example Hugo Bänziger, *Die Entwicklung der Bankenaufsicht in der Schweiz seit dem 19. Jahrhundert*, Bankwirtschaftliche Forschungen (Bern: Paul Haupt, 1986).
[31] *Bundesgesetz über die Ausgabe und die Einlösung von Banknoten vom 8. März 1881*, 1883.
[32] *Bundesgesetz über die Banken und Sparkassen vom 8. November 1934*, 1934; *Vollziehungsverordnung zum Bundesgesetz über die Banken und Sparkassen vom 26. Februar 1935*, 1935.

a professor of natural science,[33] was in 1827 the first to discuss the evolution of Swiss savings banks. Johann Ludwig Spyri[34] published the first statistics on banks in Switzerland in 1852 (*'Sparkassenstatistiken'*) and discussed the evolution of banking. Spyri was working as a priest when he published the first of his series of statistical publications. The authors and their background are in stark contrast to the publications of, for example, James William Gilbart, who was the first General Manager of the Westminster Bank. Gilbart had published his first classic banking textbook as early as in 1827 (*A Practical Treatise on Banking)*. In the 19th century, in other words, Swiss literature was far away from the level of sophistication that could be found in British banking literature. Moreover, banking literature in the German-speaking countries as a whole was also relatively slow to develop, with only a few banking textbooks to be found in these countries before the 20th century (see Section 4.1).

Finally, the two countries differ greatly in terms of the extent of academic research that has been carried out on them. Banking history in Switzerland is comparatively under-researched, despite the importance of its financial centres. One of the reasons for this is limited access to bank archives.[35] However, given the rich history of banking in Switzerland, the country proves to be an interesting case to study. The United Kingdom, by contrast, is well covered by research documenting its financial and monetary history as well as the business history of individual banks. Working on both the United Kingdom and Switzerland therefore allows for the transfer of research questions, ideas, and methodologies.

Dealing with banking in the United Kingdom in a historical context can be problematic. The United Kingdom, consisting today of England, Wales, Scotland, and Northern Ireland was a space of banking markets with different characteristics that developed independently for most of the 19th century. Scottish joint-stock banks, for example, had a longer tradition than English joint-stock banks, as they were already allowed to establish themselves before 1826. Moreover, their capital was usually higher than those

[33] Fritz Nagel, 'Bernoulli, Christoph', *Historisches Lexikon der Schweiz - Dictionnaire historique de la Suisse - Dizionario storico della Svizzera* <http://www.hls-dhs-dss.ch/textes/d/D28778.php> [accessed 31 October 2017].
[34] Beatrice Schumacher, 'Spyri, Johann Ludwig', *Historisches Lexikon der Schweiz - Dictionnaire historique de la Suisse - Dizionario storico della Svizzera* <http://www.hls-dhs-dss.ch/textes/d/D44724.php> [accessed 31 October 2017].
[35] See Youssef Cassis, 'L'histoire des banques suisses aux XIXe et XXe siècles', *Schweizerische Zeitschrift für Geschichte, Revue suisse d'histoire, Rivista storica svizzera*, 41 (1991), p. 512.

of their English counterparts.[36] Thus, the thesis distinguishes between English and British banks. When considering the 19th century, it usually specifically refers to English banks (see Chapter 4). Once the (English) Big Five banks become the dominant banks in the United Kingdom, the narrative switches to a broader geographical space (Chapters 5 and 6).[37]

Analysing the evolution of banking systems over a very long period requires compromises with regards to the number of entities that are included. Focusing on two countries for an in-depth analysis naturally limits the type of generalisations that can be drawn, especially as a comparison of the United Kingdom and Switzerland cannot provide a representative view of the history and role of capital in banking on a global level. Furthermore, the United States and Germany have deliberately been omitted from the more detailed analyses of the thesis. German banking development, deeply affected by hyperinflation and the Second World War, was not as gradual as that of Switzerland or the United Kingdom. The United States is also not included. The dual banking system and later the increasingly complex supervisory structure with several authorities (OCC, FDIC, Federal Reserve) is beyond the scope of this work. A broader geographic approach is certainly an avenue for further research.

Research Period

The starting point of the research period falls roughly in the 1830s. In England, the first joint-stock banks were established in the late 1820s, after the enactment of the Country Bankers Act in 1826.[38] Before 1826, the Bubble Act of 1720 prohibited the formation of joint-stock companies without royal charters. This distinctive regulatory setting led to the emergence of hundreds of small partnership banks (private and country banks) during the second half of the 18th century.[39] The new joint-stock model became the dominant legal form of banks in England from the mid-19th century onwards. Joint-stock banks grew in number, size, and geographic scope, reaching a peak of 110 individual banks in in England in 1885.[40] What followed was a rapid consolidation. By the turn of the century,

[36] See for example: Thomas Joplin, *An Essay on the General Principles and Present Practice of Banking in England and Scotland*, Second edition (Newcastle upon Tyne: Printed and published by E. Walker, 1822), p. 30. James William Gilbart, *The Principles and Practice of Banking* (London: George Bell & Sons, 1873).
[37] See next page for an introduction of the so-called Big Five banks.
[38] *Country Bankers Act*, 1826, c. 46.
[39] For an overview of the evolution of the UK bank population in the long run, see: Ranald Cattanach Michie, *British Banking: Continuity and Change from 1694 to the Present* (Oxford; New York: Oxford University Press, 2016), p. 31.
[40] Banks located in Wales are also included.

there were 77 joint-stock banks left. In 1918, one could count 26 banks. This rapid concentration process – known as the Amalgamations Movement – led to the emergence of the Big Five banks: Barclays, Lloyds, Westminster, Midland, and National Provincial.[41] The early consolidation in British banking also leads to better data availability for research purposes: where aggregated data for the British banking system is not readily available, one can still turn to data on the individual bank level (e.g. annual reports and other publications). By looking at a few individual banks, it is possible to analyse a representative share of the banking market.

In Switzerland, it was economic development rather than a regulatory change that triggered the establishment of joint-stock banks. Towards the end of the 18th century, the savings banks were the first banks to emerge alongside the already existing private banks. Legally, these were clubs and later cooperatives aiming to serve the public good by allowing people to deposit small savings and by giving loans to farmers. From the 1830s onwards, the Cantons started to establish banks as well, the so-called Cantonal banks. It was only in the 1850s that the first large joint-stock banks were established after the model of the French Crédit Mobilier in order to finance infrastructure, trade and industry. Besides providing loans for larger projects and financing firms as the 'steam engines of credit',[42] the joint-stock banks were also active in the underwriting business.[43] This group of banks came to be known as the 'Big Banks', a term which came into fashion through its use in the statistics of the Swiss National Bank from 1913 onwards.[44] In earlier years, contemporaries often referred to these banks as 'trading banks' (in German: 'Handelsbanken') or 'speculation banks' ('Spekulationsbanken'). In contrast to the banking models of savings or Cantonal banks, the Big Banks usually gradually expanded their geographic scope to all of Switzerland and started to operate internationally. By

[41] Barclays was incorporated in 1896 as Barclay and Company, Limited and was previously a private bank. Lloyds was incorporated in 1865 as Lloyds and Company. Westminster was established in 1834 as London and Westminster Bank. It merged in 1909 with the London and County Bank and 1918 with Parr's Bank. Midland was established 1836. National Provincial was established in 1833 as National Provincial Bank of England.
[42] Handels- und Gewerbe-Zeitung, 'Die grossen Unternehmungen der Westschweiz', *Handels- und Gewerbe-Zeitung* (Zürich, 26 April 1856), pp. 189–90 (p. 190).
[43] See for example Albert Linder, *Die schweizerischen Grossbanken*, Beiträge zur schweizerischen Wirtschaftskunde (Bern: Stämpfli & Cie, 1927). or Adolf Jöhr, *Die schweizerischen Grossbanken und Privatbankiers* (Zürich: Polygraphischer Verlag, 1940), p. 13ff.
[44] The SNB described the Big Banks as 'the few trading banks, that are united in the cartel of Swiss banks and that are outreaching all other trading banks by the size of their own and debt capital as well as their international business activities'. Swiss National Bank, 'Das Schweizerische Bankwesen 1909-1913' (Buchdruckerei Stämpfli & Cie, 1915), p. 3.

1918, there were eight large joint-stock banks.[45] Severe losses in the Great Depression reduced the number of Big Banks to five.[46] The 1990s was subsequently a period of rapid market consolidation in Swiss banking. Credit Suisse took over Bank Leu in 1990 and the Swiss Volksbank in 1993, while the Swiss Bank Corporation merged with the Union Bank of Switzerland (UBS) in 1998.[47]

The research period of this thesis ends in 1988, with the enactment of the Basel I framework by the Basel Committee on Banking Supervision. Basel I is the endpoint of a regulatory evolution towards an international framework for assessing capital in banking. Studying the effects of Basel I in the United Kingdom and Switzerland is beyond the scope of this research. What is of interest, however, is the evolution of banking legislation with a particular emphasis on capital requirements and its effects on capital/assets ratios until 1988 (see Chapter 6). Both in the United Kingdom and Switzerland, regulation gradually developed towards a risk-weighted approach by the 1970s and 1980s.

Methodology, Data and Archives

Methodologically, the thesis uses descriptive statistics to outline the long-run trend of capital/assets ratios. In a second step, a comparative narrative is developed, using the United Kingdom and Switzerland as examples to shed light on potential determinants of capital/assets ratios. Given the time frame covered in the thesis, from the 1830s to 1988, the chapters each focus on specific topics.

Besides building upon existing literature, the thesis also uses also a wide range of primary sources. The balance sheet data of banks was mostly obtained from printed sources such as historical and academic publications, newspapers and magazines. This data is complemented with data drawn from individual banks in the United Kingdom and

[45] Schweizerischer Bankverein SBV, Basel; Schweizerische Kreditanstalt SKA, Zürich; Schweizerische Volksbank SVB, Bern; Bank Leu, Zürich: Eidgenössische Bank, Zürich; Schweizerische Bankgesellschaft SBG, Winterthur; Basler Handelsbank, Basel; Comptoir d'Escompte de Genève CEG, Genf.

[46] The Comptoir d'Escompte de Genève was liquidated in 1934. Eidgenössische Bank and Basler Handelsbank never fully recovered from the crisis of the 1930s and were eventually both taken over in 1945.

[47] For an overview of Switzerland's banking history, see: Franz Ritzmann, *Die Schweizer Banken: Geschichte, Theorie, Statistik*, Bankwirtschaftliche Forschungen (Bern: Haupt, 1973); Youssef Cassis and Jakob Tanner, *Banken und Kredit in der Schweiz (1850-1930)* (Zürich: Chronos, 1993); Cassis, *L'histoire des banques suisses*; Youssef Cassis, 'Commercial Banks in the 20th-Century Switzerland', in *The Evolution of Financial Institutions and Markets in Twentieth-Century Europe*, ed. by Youssef Cassis, Gerald D. Feldman, and Ulf Olsson (England: Scolar Press, 1995), pp. 64–77; Malik Mazbouri, Sébastien Guex, and Margrit Lopez, 'Finanzplatz Schweiz', in *Wirtschaftsgeschichte der Schweiz im 20. Jahrhundert*, ed. by Patrick Halbeisen, Margrit Müller, and Béatrice Veyrassat (Basel: Schwabe Verlag, 2012), pp. 468–518.

Switzerland. This bank-level data was obtained mostly from banks' annual reports as well as from newspapers, magazines and academic literature covering the history of individual banks.

There are several reasons for not only using aggregated time series but adding single bank-level data as well. First, some aggregated datasets are not available for the whole research period and/or do not include separate balance sheet items vital for assessing capital ratios. Second, the bank-level data provides insights into the behaviour of individual banks, required to analyse capital ratios. Raising more capital, for example, is a decision taken by a bank based not only on external factors but also internal ones, such as the profitability of the bank, its current assets and liabilities structure, or the expansion of its business activities. An aggregated view blurs such internal factors. Third, there is a large variety within the capital/assets ratios of different banks, undermining the validity of using mean values.

Several archives were used to access additional sources. For Switzerland, the Swiss Federal Archives provided material on the supervisor (Federal Banking Commission) as well as the legislative process behind the development of the Banking Act and its predecessors with the involvement of the Federal Department for Finance and Customs. Further material (annual reports, archival material from the stock exchange, press reports) was obtained from Zurich's Central Library, the 'Zentrale für Wirtschaftsdokumentation' at the Library of Business Administration of the University of Zurich, the Swiss Social Archives, and the Public Records Office of the Canton of Zurich (Staatsarchiv).

For the United Kingdom, the British National Archives were used to access material on legislative processes and the works of various committees. The London Metropolitan Archives were used to obtain archival material of the Committee of London Clearing Bankers and the Bankers' Association. The archive of the Bank of England gave access to the role of the supervisor. Finally, the archive of the Westminster Bank, held by the archive of the Royal Bank of Scotland, was used to gain insights into banks' internal discussions on capital.

1.3. Structure of the Thesis

The literature review has shown that the existing academic work discusses many different factors that might have influenced the capitalisation of banks over time. Potential determinants – such as regulation, consolidation, wars, and inflation – serve as starting points for the research. However, the thesis does not claim to fully explain the evolution of capital/assets ratios by addressing all the potential drivers discussed in the existing literature. Instead, the focus is on issues related to the measurement of capital in banking and three vital themes for the evolution of capital ratios.

Chapter 2 provides the theory on banking and more narrowly bank capital. It offers some basic remarks on the working of balance sheets and income statements as well as the definition of capital. Moreover, the chapter discusses the role of capital and the question of optimal capital structures in banking.

Chapter 3 describes the evolution of capital/assets ratios in Germany, the United States, the United Kingdom, and Switzerland from the 19th century to the present. Focusing particularly on British and Swiss banks, the chapter then discusses the accuracy of capital/assets ratios by shedding light on the topics of hidden (undisclosed) reserves and extended forms of shareholder liabilities. It also questions the widespread use of long-run time series on capital in banking. For the United Kingdom, the thesis builds on and extends existing research, enhanced by data collected by the author. In the case of Switzerland, new data on hidden reserves and extended shareholder liabilities will be examined for the first time. The data were obtained from public and archival sources.

Additionally, structural changes in the assets of British and Swiss banks are analysed using the Basel I framework of 1988 for a historical simulation. Assets in both banking systems were categorised into asset classes according to their risk. Each category has a specific risk-weight attached, which allows the calculation of risk-weighted assets. Comparing these risk-weighted assets to the capital shows whether the increased leverage over time was not merely the result of lower risks associated with the assets.

Chapter 4 deals with the emergence of commercial banking up until the outbreak of the First World War. The First World War marks a fundamental change in the financial system, with the end of the first wave of globalisation and the classical gold standard. The starting point of the research period in this chapter varies: in England, the first joint-stock banks were established after the Banking Corporation Act in 1826; in Switzerland

large commercial banks (Big Banks) were established in larger numbers only in the second half of the 19th century.

The chapter gives special emphasis to the role of the early banking literature in shaping the ideas of bank managers about capital adequacy. In Switzerland, simple rules of thumb in the form of fixed ratios seemed to be surprisingly persistent, while the English banks abandoned such strict guidelines from very early on. Assessments about adequate capital became more nuanced as banking was professionalised and bankers accumulated knowledge on how to run banks. Nevertheless, in the absence of regulatory capital requirements, informal conventions between banks on how much capital was considered adequate were important.

Chapter 5 focuses on the period of the two World Wars. Both wars led to substantial declines in capital/assets ratios. In the United Kingdom, capital/assets ratios fell from 8.3% to 5.5% (WWI) and from 5.5% to 3.0% (WWII), in Switzerland from 15.0% to 13.1% and from 12.0% to 10.4%. These declines represent a substantial reduction in capital levels. Examining both World Wars in one chapter provides the opportunity to elaborate on the commonalities of war financing through banks. Moreover, both wars offer similarities in terms of the macroeconomic environment, most notably high inflation and the expansionary monetary policy. Chapter 5 shows that three drivers had a severe impact on the capitalisation of banks. First, banks held high shares of the total government debt, which led to an expansion of balance sheets. At the same time, high inflation ratios devalued the paid-up capital of banks. Moreover, formal and informal constraints restricted banks from issuing capital in wartime. The chapter also addresses why banks recapitalised after the First World War, and why they did not after the Second World War.

The Second World War in particular had long-lasting effects for the evolution of banks and their capital. The United Kingdom had already entered a period of cheap money during the 1930s, and the control of capital issuances after 1939 reinforced the financial repression of the banks. The Bank of England conducted the country's monetary policy with the aim of securing the demand for government debt. In this role, the Bank of England was an informal supervisor that controlled the banks through liquidity ratios. As the research shows, British banks wanted to increase their capital both during and after the Second World War but were prevented from doing so by the Bank of England.

Paradoxically, the Swiss Banks operated in a regulated, but much more liberal framework. There was a formal supervisor and banking legislation, but banks had substantially more leeway in making their own decisions. There was no widespread recapitalisation after the Second World War, as was the case after 1918. On the one hand, the Big Banks were still restructuring themselves as a result of the Great Depression – a process that had come to a halt due to the war. On the other hand, there was also a genuine feeling that the business models of banks would not require that much capital anymore.

Chapter 6 deals with the role of regulation in banking and its impact on the capital structures of banks after 1934 in Switzerland and after the Second World War in the case of the United Kingdom. The post-World War Two period is marked by high growth, the globalisation of banking and a trend towards a harmonised framework for banking regulation. The Basel Accord (Basel I) was passed in 1988. By analysing the regulatory systems of Switzerland and the United Kingdom, it will be shown that the implementation of Basel I in the two countries in 1989 and 1991 represented a gradual evolution of capital regulation. Both countries had already moved towards a risk-weighted system in the years before 1989.

In both countries, the banks were involved in shaping the design of capital regulation. When minimum capital ratios were introduced in Switzerland in 1935, most banks were indifferent, either because their capital surpassed the minimum requirements or because, having just found themselves in the middle of a crisis, they lacked bargaining power. This indifference changed towards the end of the 1950s. With the balance sheets of Swiss banks rapidly expanding, the regulation of capital through capital ratios suddenly became a bottleneck for growth. The regulatory framework was developed in a collaborative fashion. The capital requirements were lowered. Without these changes, the Swiss banking could not have grown to such an extent.

The United Kingdom lacked the experience of a solvency crisis during the 1930s, with the result that capital in banking had become an almost irrelevant topic. It took until the secondary banking crisis in 1973/1974 for the regulation and supervision of banks to finally be reconsidered. Here too, working papers on how to assess capital adequacy were an outcome of discussions between the Bank of England and the banks. Thus, the chapter emphasises the role of capital regulation, how it was developed, and how it impacted the capital level of banks.

Chapter 7 provides a conclusion and an outlook for future research.

2. Capital and Banking in Theory

Understanding the role of capital in a bank first requires an understanding of the inner workings of a balance sheet. Moreover, it is crucial to understand how equity capital is defined and that published and internal accounts are not necessarily the same. In addition to these subjects, this chapter discusses the effects of diminishing capital as well as the relationship of capital to other balance sheet items such as deposits or the total assets or liabilities. Finally, the chapter aims to address the question of incentives of different capital structures by providing an overview of the corporate finance literature, which provides ideas on potential factors determining capital/assets ratios.

2.1. Accounting Perspectives

Figure 1 shows a simplified bank balance sheet consisting of assets, liabilities, and equity capital. The asset side summarises a company's investments, whereas the liability side shows how a company is financing its operations at a given point in time. Both debt and equity are often viewed as forms of capital. In order to distinguish clearly between the two sources of funding, 'debt capital' will be specifically referred to as such in what follows. If only the term 'capital' is used, it refers to 'equity capital'. Furthermore – unless otherwise specified – capital refers to the book value of equity capital and not the market value. Besides the use of 'capital' in finance and accounting, there are also various other definitions, such as 'capital' as a factor of production in economics. In the context of this work, however, an accounting and finance view is followed.

Assets	Liabilities
Cash	Due to banks
Money market, bills of exchange, drafts	Due to customers, cheques
Due from banks	Bonds
Due from customers	Bills of exchange
Mortgages	Other debt
Financial investments and participations	
Tangible assets	*Equity capital*
Other assets	• *Share capital*
	• *Reserves*
	• *Retained earnings*
Total assets	**Total liabilities**

Figure 1: Simplified Balance Sheet of a Bank

Equity Capital

The equity capital consists of the shareholders' capital, reserves and retained earnings. Companies can raise shareholders' (or share) capital through the issuing of shares when its established or through the increase of the share capital. This type of capital as a balance sheet item is set in nominal terms. The nominal (book) value and the market value of equity capital can deviate substantially, depending on the expectations of investors.[48]

The (disclosed) reserves stem from two sources. Firstly, companies can attribute a part of the annual profit to the reserves. Secondly, shares are often issued at a higher price than their nominal value. The share premium (agio) is allocated to the reserves. Reserves can also be released, for example to absorb losses. Finally, the retained earnings consist of the profit remaining after reserves are allocated and dividends are distributed to shareholders. This remaining profit is carried over to the next year.

Undisclosed (Hidden) Reserves as Part of the Capital

One major obstacle in measuring equity capital is undisclosed, or so-called 'hidden', reserves. In the absence of any regulation prohibiting hidden reserves, companies can create hidden reserves through two processes. Firstly, a reserve is not listed under reserves but as a liability in the balance sheet.[49] Therefore, the liability is overvalued (book value is above the actual market price). Secondly, an asset in the published financial statement is undervalued (book value is below the actual market value) or not listed at all in the balance sheet.

The most obvious example of hidden reserves in published accounts can usually be found in properties owned by the banks. In many cases, the book value of premises in the published balance sheet item remains identical for several years. If real estate prices were rising at the time, the difference between market value and the book value would represent a hidden reserve.

By keeping an asset undervalued or a liability overvalued, a bank avoids realising a profit, which would become part of the capital if not paid out to the shareholders. If a loss

[48] The share price depends on investors' decisions to buy or sell stocks. If this decision is based on 'fundamentals', the stock price can be determined as discounted expected cash flows of the company.
[49] A typical example is the use of provisions. Depending on the definition of provisions, it is debatable whether it represents debt or equity capital. See discussion further down.

occurs, however, the bank can revalue an asset or liability and therefore release hidden reserves to cover losses or smooth profits. Hidden reserves are therefore a form of capital and a safety cushion in times of crises when, for example, more defaults on loans occur. Consequently, the function of hidden reserves is somewhat similar to that of disclosed reserves, with the notable exception that the public is not aware of their true extent.

Determining the true size of hidden reserves, however, is difficult if not impossible to do. The amount of hidden reserves depends on the valuation of assets and liabilities, and there is not usually a market price for every single item on a bank's balance sheet. Moreover, valuations might vary based on accounting standards. Despite all this, banks themselves often kept track of their approximate hidden reserves, as will be shown in Chapter 3.

Historically, there seemed to be three motives for maintaining hidden reserves; some of them will be discussed in more detail in later chapters. Firstly, many banks aimed for stable profits and stable dividends in order to signal stability. Secondly, banks pay dividends on the nominal capital. Especially in the 19th and first half of the 20th century, a high dividend was also a matter of reputation. Maintaining high (disclosed or undisclosed) reserves while having a comparatively small nominal capital allows for substantial dividend payments on the nominal capital. The total capital consisting of reserves and nominal capital can be substantial nevertheless. Thirdly, building up hidden reserves instead of realising profits might avoid taxes on profits.[50]

The problem of hidden reserves can also be subsumed under the term 'window dressing'. In order to present figures to the public or the supervisor more favourable than the actual (internal) ones, banks might opt to initiate certain transactions. A typical example would be a short-term increase in liquidity to signal financial stability before a report to the supervisor was due.[51] The use of hidden reserves for profit smoothing is

[50] This depends on the fiscal treatment of hidden reserves. In Switzerland, the use of hidden reserves to avoid taxes is still common practice among smaller banks. However, the extent of doing that has to be negotiated with the Cantonal tax authorities.

[51] For a brief overview on window dressing in Britain, see: Mark Billings, 'Financial Reporting, Banking and Financial Crisis: Past, Present and Future', in *Complexity and Crisis in the Financial System*, ed. by Matthew Hollow, Florian Akinbami, and Ranald Michie (Cheltenham: Edward Elgar Publishing, 2016), pp. 287–305 (p. 291).
For a review of the regulation of hidden reserves in the 1970s, covering the EEC countries, Japan, Switzerland, and the USA, see: Wolf-Dieter Becker and others, *Stille Reserven in den Jahresabschlüssen von Kreditinstituten : eine Studie über die Handhabung in den Ländern der Europäischen Gemeinschaft sowie in der Schweiz, in den USA und in Japan*, ed. by Peat,

also one form of window dressing, as the published financial statements do not necessarily reflect the actual condition of a bank.

Calculating bank capital is thus not as straightforward as it might seem when looking at a published balance sheet statement. Quite the contrary: estimating the extent of hidden reserves is crucial in order to assess the extent of the actual capital resources of a bank. In the presence of hidden reserves, the disclosed capital of banks will be less than the undisclosed capital. Therefore, time series showing capital ratios in countries that allowed hidden reserves are distorted. With a few exceptions, the academic literature neglects the topic of hidden reserves. Section 3.4 provides a detailed analysis of hidden reserves in Switzerland and the United Kingdom and discusses the academic literature for the two countries.

Even if the true extent of hidden reserves is often unclear, there are still conclusions that can be drawn from looking at published data, as the published data represent a sort of lower bound for the potential 'actual capital'. Moreover, if a bank intends to signal stability to the public by smoothing profits (and using hidden reserves to do so), a decrease in published reserves might be an alarm signal. It could mean that the bank's hidden reserves had already been depleted to cover losses and that the bank was now being forced to use its published reserves.

Unlimited and Extended Shareholder Liabilities

To what extent is a shareholder liable for a bank's losses? In modern times, the potential loss is usually limited to the amount of investment made in the bank. If a shareholder buys one share for 100, the maximum loss is 100. In a system of extended or even unlimited liability, however, shareholders are subject to potential losses above their initial investment. In the case of unlimited liability, shareholders potentially risk their personal wealth being used to cover the difference between the bank's assets and its liabilities.

If liability is extended, shareholders are liable for a certain amount – for example a multiple of the share's nominal amount. In such a case, the total sum of unpaid capital can be calculated, enabling the value of the unpaid capital to be measured (based on the assumption that all shareholders can pay up the unpaid part of the capital). If liability is unlimited, however, the ultimate value of the shareholder liability depends on the wealth of the bank's shareholders. Nevertheless, both forms – extended and unlimited

Marwick, Mitchell und Co., Schriften des Verbandes öffentlicher Banken (Göttingen: O. Schwartz, 1979).

liability – represent an obligation for shareholders beyond their actual investment in the bank. And if unpaid capital could be called up in the event of a bank failing, it has similar characteristics to equity capital. When assessing capital in banking, therefore, extended or unlimited shareholder liability have also to be considered.

Section 3.5 deals with the relevance of shareholder liabilities in Switzerland and the United Kingdom. In Switzerland, banks with legal status as a cooperative (for example savings and loans associations such as the Raiffeisen banks) have typically operated with an extended form of liability. Swiss banking legislation even allowed this extended liability to be credited as equity capital for capital requirements from its introduction in 1934 until 2012.[52] In England, there were several forms of contingent capital in place over time (unlimited liability, uncalled capital, reserve liability). With the collapse of the City of Glasgow Bank in 1878, unlimited liability rapidly disappeared, giving rise to reserve liability. Contingent forms of capital remained important in British banking until the late 1950s. Section 3.5 will provide data on England and Switzerland, showing the extent of contingent capital in both banking systems.

Equity vs Debt Capital

Distinguishing between debt and equity capital can be difficult. One example of the ambiguities involved are general provisions (or general loan-/loss reserves). A bank creates provisions if it is aware of a loss that has occurred during a specific period. The exact amount, however, is unknown and expected to materialise in the future. Even though general provisions are reserves, the working definition of ‘equity capital’ used in this thesis does not include general provisions. In contrast to general reserves, general provisions are created for a specific, expected cause (i.e. an anticipated future loss). It is the expectation of actually using the provision which characterises it as debt rather than equity capital.[53]

Modern classifications of the liability side of balance sheets also use the word ‘mezzanine capital’ to describe a hybrid form of capital that can be either debt or equity. Examples of mezzanine capital are subordinated debt or preferred equity. Both examples represent claims on the asset side that are senior to (common) share capital. Neither of

[52] Swiss Financial Market Supervisory Authority FINMA, *Änderung der Eigenmittelverordnung, Erläuterungsbericht vom 20.07.2009*, 2012.
[53] The classification of general provisions was also debated in the BCBS when developing the Basel Accord. In the final Basel Accord, general provisions were defined as supplementary capital. Basel Committee on Banking Supervision, *International Convergence of Capital Measurement and Capital Standards (Basel I)*, 1988, pp. 5–6.

these hybrid forms of capital are defined as ‘equity capital’ in this thesis. In order to track capital over a long period, the definitions have to be static.

Nevertheless, it should be noted that modern capital regulation takes a different stance on this topic. In fact, the definition of capital has broadened over time and the current Basel III regulation classifies three levels of capital, each taking into account more balance sheet items (Common Equity Tier 1, Additional Tier 1, Tier 2 Capital).[54] Historically, subordinated debt became a crucial funding source in the second half of the 20th century. In Switzerland, banks could use subordinated capital for regulatory purposes as ‘capital’ after 1981. During the 1990s, subordinated debt contributed up to 20% of the regulatory capital requirements (see Section 6.2.3). In the United Kingdom, the use of subordinated debt as a form of capital was even more common. The so-called ‘loan stock’ was viewed as a form of security for depositors. The official banking statistics of the Bank of England from the 1960s did not even differentiate the different sources of capital but classified ‘loan stock’ as equity capital (see Section 6.3.2). This official definition makes the tracing of a narrow capital for British banks difficult.

Assets and Liabilities

Similarly to the measurement of capital, determining the total assets is not a very precise exercise. Not all of the obligations of a bank result in a balance sheet entry. Guarantees given to customers, for example, are often considered as off-balance-sheet items.[55]

The structure of a bank’s balance sheet is fundamentally different from that of any company in the non-financial sector. A large part of the funding is usually collected from depositors, whereas firms tend to depend on funding from banks or investors, for example, in the form of loans, notes, bonds, and shares. On the asset side, companies’

[54] Common Equity Tier 1 consists of common shares, share premia, retained earnings, and disclosed reserves. Additional Tier 1 consists for example of contingent convertible bonds (CoCo bonds). Tier 2 Capital consists for example of subordinated debt. For detailed definitions, see: Basel Committee on Banking Supervision, *Basel III: A Global Regulatory Framework for More Resilient Banks and Banking Systems*, 2010.

[55] The Swiss bank Credit Suisse for example treated guarantees as ordinary balance sheet items until the 1960s and then changed them into off-balance-sheet items. Thus, the total amount of both guarantees given and received was declared, but only listed below the official balance sheet statement, and was no longer part of either the assets or the liabilities.
On an international level, the problem of off-balance sheet items became evident in the 1970s and was also addressed by the Basel Accord. Basel Committee on Banking Supervision, *Basel I*, pp. 12–13.

investments are often in the form of tangible assets, whereas banks supply the economy with short- or long-term credit or invest their capital in financial markets.

Even among banks themselves, there is a variety of balance sheet structures, depending on their business activities. A first criterion for distinguishing between bank types is whether they issue banknotes or not. The currency in circulation is listed on the liability side. In a system with a note-issuing monopoly, a central bank can theoretically also operate with negative equity capital. In an environment with several note-issuing banks, however, the low capital position of a given bank might undermine the trust of its depositors and noteholders. In England, the Bank of England held a partial note-issue monopoly from 1708 and a full monopoly from 1844 onwards. In Switzerland, the Swiss National Bank received the note-issuing monopoly in 1905.

2.2. Capital in Relative Terms

How should capital be measured? As shown above, defining capital is not as straightforward as one might expect. Once defined, the total capital can be obtained by adding up the share capital, disclosed reserves, retained profits and if needs be, items such as hidden reserves or unpaid capital. Assessing the adequacy of capital, however, requires comparisons. Comparisons lead to a variety of capital ratios. The following sections introduce such ratios and discuss problems in using them. In assessing the 'adequate' capital of a bank, the terms 'solvency' and 'capital adequacy' were and still are often used. In the 1950s and 1960s, 'solvency' was more commonly used in the United Kingdom, whereas 'capital adequacy' was the usual term in the United States.[56] Today and in the context of this thesis, both terms are used interchangeably.

Historically, bank capital was often compared with four aggregates: deposits, liabilities, total assets, and risk-weighted assets. Dividing the capital by these aggregates leads to four capital ratios, which provide the basis for discussing capital adequacy. These capital ratios increase if the equity capital rises with total assets, risk-weighted assets, deposits, or liabilities held constant.

The first figure used as a comparison point for the capital was customers' deposits. In England, early references to the capital/deposits ratio can be found in James William Gilbart's *A Practical Treatise on Banking* in 1827. The deposits as a measure for the

[56] Jack Revell, *Solvency and Regulation of Banks: Theoretical and Practical Implications*, Bangor Occasional Papers in Economics (Bangor: University of Wales Press, 1975), p. 12.

extent of capital were used by the banks, the media, and also the Bank of England well until the 1950s. *The Bankers' Magazine*, for example, published an annual overview on *The Progress of Banking in Great Britain and Ireland*, discussing – among other topics – the changes in the capital/deposit ratios each year until the 1940s. A slight variation on the capital/deposits ratio was used from roughly the 1940s to the 1980s. Fixed assets (e.g. premises) were deducted from the amount of capital. The remaining capital was then compared to the total deposits, leading to the 'fixed assets ratio' (see also Section 6.3.2).

The frequent use of deposits as a comparison point for capital related to the fact that English joint-stock banks financed themselves mainly through deposits. In 1900, 80% of the total assets came from deposits and current accounts.[57] In 1940 and 1980, the proportion of deposits to total assets was at around 90%.[58] Moreover, the capital resources were considered to be a form of protection for depositors against losses and to improve the confidence of depositors.[59] Thus, linking the capital to the deposits was the obvious choice.

Switzerland moved away from using the capital/deposit ratio much earlier. For most of the 19th century, the capital/deposit ratio was still the regular ratio used to describe the capital level of a bank. As in England, the reason for this can be found in the funding side of the banks. Most of the liabilities of savings and Cantonal banks were deposits.[60] However, when joint-stock banks grew both in terms of number and size during the last third of the 19th century, capital/liability ratios became more popular.[61] The total liabilities would include not only deposits, but also bonds, loans from other banks, and bills of exchange.

[57] 'Banking Supplement 1901', *The Economist* (London, 18 May 1901).
[58] Data in 1940 (joint-stock banks in England and Wales), see 'Banking Supplement 1941', *The Economist* (London, 20 November 1941). Data in 1980 (UK clearing banks), see Jack Revell, *Costs and Margins in Banking: Statistical Supplement 1978-1982*, ed. by Organisation for Economic Co-Operation and Development OECD (Paris: OECD, 1985).
[59] Bernard Wesson, *Bank Capital and Risk: A Survey of the London Clearing Bank Groups: 1976-1983* (London: The Institute of Bankers), p. 70.
[60] See for example early banking statistics published by Bernoulli or Spyri: Christoph Bernoulli, 'Über Sparkassen und die hohe Wichtigkeit und Bedeutung derselben als Social-Institution', *Schweizerisches Archiv für Statistik und Nationalökonomie oder Beiträge zur Kenntniss und Förderung unseres Nationalwohlstandes*, 1 (1827), 1–28. Johannes Ludwig Spyri, *Die Ersparnisskassen der Schweiz (1852-1862)*, Schweizerische Statistik (Zürich: Druck von Gebrüder Gull, 1864).
[61] Capital + liabilities = total assets. Therefore, the capital/assets ratio can be derived from the capital/liabilities ratio: c/a ratio = capital / (capital + liabilities)

Nevertheless, the deposits were a crucial funding source, albeit much less important than in England. Analysing the balance sheet of the group of the Swiss Big Banks, one can see that in 1900 about a quarter of the balance sheet was financed by deposits and current accounts.[62] In 1940, the proportion of deposits to total assets was 57%, in 1980 48%.[63] Besides the increasing importance of big joint-stock banks with a diverse liability structure, regulatory changes also contributed to the use of the capital/liability ratio. The Banking Act and Banking Ordinance of 1934/1935 introduced capital requirements based on a capital/liability ratio. It was a deliberate choice by the regulator since the new act applied to all banks and not only savings banks (see also Section 6.2.1).

A newer approach to measure the adequacy of capital has been to focus on the asset side of banks. Comparing the capital of a bank with its assets is a logical step if capital is understood as a buffer against losses of assets. Crude approaches at the beginning of capital regulation looked, for example, at the composition of the assets and the risks associated with them (e.g. the low risk of cash). A more sophisticated approach was a risk-weight methodology. According to this approach, each asset category was weighted, depending on its risk. If the risk was high, the asset was multiplied by a high weight (and vice versa). This led to the risk-weighted assets. Risk-weighted models were discussed and developed in the 1970s and 1980s, and introduced on the international level as the Basel Accord (Basel I) in 1988.[64] However, like many other countries, both the United Kingdom and Switzerland already had risk-weighted capital regulation in place before Basel I was introduced (see Chapter 6).[65]

Furthermore, risk-adjusted capital adequacy models were already discussed in the United States in the context of the Second World War and its financing. Tynan Smith and Raymond E. Hengren suggested a ‘capital/risk assets ratio’ in 1947. Their approach excluded cash and government bonds from the assets, thus weighting it with 0% as in Basel I.[66] The reason for these discussions was that many US banks no longer met a

[62] Linder, *Die schweizerischen Grossbanken*, pp. 120–21. For a definition of the Swiss Big Banks, see Section 1.2, p. 17.
[63] Swiss National Bank, ‘Historical Time Series’, 2009.
[64] Basel Committee on Banking Supervision, *Basel I*.
[65] In 1985, seven out of the nine European countries that were members of the Basel committee had already adopted risk-weighted approaches. Daniel K. Tarullo, *Banking on Basel: The Future of International Financial Regulation* (Peterson Institute for International Economics, 2008), p. 41.
[66] Tynan Smith and Raymond E. Hengren, ‘Bank Capital: The Problem Restated’, *Journal of Political Economy*, 55.6 (1947), 553–66.

capital/deposits ratio of 10% during the Second World War – which was the standard rule of thumb in the US at the time.

On an international level, Basel I constituted the first attempt at making the required capital of a bank dependent on the risks of bank assets. From that perspective, Basel I was an improvement compared to ratios using deposits, liabilities or total assets as a denominator. It created a baseline methodology upon which regulators could develop their national capital regulation.

At the same time, Basel I also created various wrong incentives. Its deficiencies were and are often discussed, including the fact that the asset weights were crude and did not capture the risks of individual assets. Moreover, Basel I dealt exclusively with credit risk and specifically refrained from regulating other forms of risks, such as market risk, operational risk or liquidity risk.[67] The concepts put forward at the time also created incentives for capital arbitrage, as banks started to assess their own economic capital based on their risk management since the 1990s. If the economic capital is above the required capital, a bank might have reasoned that it destroys shareholder value, therefore reducing its economic capital.[68] Furthermore, Basel I allowed banks to hold substantial parts of their assets in off-balance-sheet vehicles.

The Basel II requirements of 2004 refined the risk-weighted approach in the regulation of capital and addressed the various deficiencies of Basel I.[69] One of the most severe changes was probably that proprietary risk-weighting models were allowed as well. It gave banks leeway in assessing the risks, and depending on those, the size of their capital buffers. In the area of credit risk, for example, banks could also use the so-called 'internal rating-based approach'.[70]

The following analyses of capital adequacy build mostly on the ratio of capital to total assets (capital/assets ratio), which is still in use as the basic concept for today's 'leverage ratio'. The term leverage ratio, however, is not used, unless it specifically refers to the leverage ratio as defined by Basel III.[71]

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[67] The Basel Committee specifically mentioned that other forms of risks had to be considered by the supervisors. Basel Committee on Banking Supervision, *Basel I*, p. 2.
[68] Laurent Balthazar, *From Basel 1 to Basel 3: The Integration of State of the Art Risk Modelling in Banking Regulation* (New York: Palgrave Macmillan, 2006).
[69] Basel Committee on Banking Supervision, *Basel II: International Convergence of Capital Measurement and Capital Standards: A Revised Framework*, 2004.
[70] Basel Committee on Banking Supervision, *Basel II*, pp. 48–112.
[71] Basel Committee on Banking Supervision, *Basel III Leverage Ratio Framework and Disclosure Requirements*, 2014.

2.3. Banking Theory Perspectives: Financial Intermediation, the Role of Banks and the Nature of Capital

The transformation of savings from private households, companies, or governments into credit to the very same categories of borrowers can occur through two channels: financial markets or financial intermediaries. In the first case, borrowers' and lenders' interests are usually intermediated directly through instruments such as stocks or bonds via a stock exchange. This process is also called direct finance. In the second case, which is termed indirect finance, financial intermediaries take over this role. Such intermediaries can be banks, insurances, or funds, to name just a few. If a bank receives savings, this is considered as a liability and constitutes one form of debt. If the capital from the deposits is invested in credit (e.g. a mortgage to a private household), it is considered an asset. Consequently, the financial intermediation process runs 'through' a bank's balance sheet. This indirect model of financial intermediation is referred to as a bank-based model, while the former system is categorised as a market-based model.[72]

From the perspective of financial intermediation, the bank provides various services to the public. For example, the transformation of maturities (accepting short-term deposits and borrowing long-term credit), the transformation of amounts (lot size transformation, using many small deposits to provide larger credits), or the transformation of risks (for example by lending to a large number of creditors, which should lead to a diversified credit portfolio). Moreover, banks can (theoretically) reduce transaction costs, especially for small lenders, because they have developed economies of scales. Finally, banks might take steps to alleviate the problems of adverse selection and moral hazard. The former is created before a transaction occurs (e.g. a loan) and refers to the effect wherein lenders that are most actively looking for debt are likely to be selected but also very likely produce adverse outcomes. The latter is created after a transaction if a lender engages in activities that are not in the interest of the borrower and endanger for example the ability to continue paying interests or repaying debt.[73]

Although receiving deposits and providing loans is the classic example for financial intermediation, banks allocate their funds in various investments on the asset side (see also Figure 1 above), the safest being simple cash holdings, which is an investment with

[72] For a comprehensive overview on the literature on bank- and market-based financial systems, see: Allen and Gale, *Comparing Financial Systems*.
[73] See for example Frederic S. Mishkin, Kent Matthews, and Massimo Giuliodori, *The Economics of Money, Banking, and Financial Markets*, European edition. (Harlow: Pearson, 2013), p. 35ff.

various advantages. It is very stable in value in the absence of inflation and is also liquid. If the share of cash increases, the overall risk of a bank does not increase. This level of safety, however, comes with a price, as cash does not yield any interest. Other assets in a bank's balance sheet may be government or corporate bonds, stocks from companies, or lending to other banks. Their characteristics differ widely: some are easy to sell even in crises (hence very liquid) – and others are not. Some assets are subject to substantial price fluctuations, others are rather stable. In other words, they pose different kinds of risks, which are rewarded with a risk-adjusted return if markets are efficient. The two key risks are credit risk, which is the risk of a default of a counterparty, and liquidity risk, which refers to the risk that an asset cannot be sold immediately on the market.

On the liability side, banks finance themselves via deposits from customers, loans from other banks or central banks, or bonds from financial markets. During the times when issuing banknotes was not centralised, another important item on the liabilities side was banknotes. The above-mentioned items on the liabilities side are considered debt capital. What remains – the difference between total assets and debt capital – is considered equity capital. The structure of the funding side of banks is highly relevant too. The sources on the liability side might be, for example, customer deposits on current (or checking) accounts, savings accounts or funds from capital markets. In addition, all three sources have different maturities. Current accounts can be withdrawn immediately, while bonds can have a maturity of several years. Risk can arise from the relationship between the assets and liabilities through different maturities or within the liabilities. In the first case, depositors might withdraw money, which is fixed on the asset side in longer maturities (maturity mismatch). Within different liabilities, savings deposits are a more stable source of funding than liabilities payable on demand because depositors can usually not withdraw them immediately. Moreover, the size of equity capital matters as well, since a higher capital represents less dependence upon debt capital.

The structure of a bank's balance sheet poses various risks that can lead to illiquidity or insolvency. Both concepts are closely related. If the total assets are equal to or smaller than the liabilities, the bank is insolvent, as the equity capital has vanished. Insolvency usually leads to the liquidation of a company. Illiquidity, by comparison, describes what happens when depositors or other short-term creditors (e.g. other banks) call in their funds immediately and the bank is not able to sell off assets quickly enough to cover these withdrawals. Even the mere threat of possible illiquidity might trigger the banks' customers to demand their deposits in cash and customers have an incentive to be first

in line in such a case.[74] Hence, even a very stable bank can face a bank-run by its customers, triggered for example by a ripple of fear caused by neighbouring banks falling into trouble.

Thus, both solvency and liquidity are crucial for the stability of a bank. However, in a crisis, it is often difficult to disentangle the two. Illiquidity often occurs when creditors question solvency. A distinction between liquidity and solvency is often made through the use of different time horizons: a bank is liquid if it can settle debts by a fixed due date and solvent if it can settle debts in due course. In that sense, the two concepts have in common that they are both concerned with settling debts. Moreover, asset and liability management (ALM) links the two concepts together. The active management of different durations on the asset and liability side became more popular with the growing money and wholesale markets of the 1960s.[75] While asset and liability management ensures the liquidity of banks, it also affects solvency through the assets that a bank invests in and the structure of the funding side.

Given that liquidity and solvency are highly intertwined, a narrow focus on one or the other is unproductive. Therefore, when assessing the role of capital in the following chapter, the role of liquidity will be included as well where necessary.

2.4. Corporate Finance Perspectives: Optimal Capital Structure

What are the costs and benefits of high leverage? Franco Modigliani and Merton Miller's article on the cost of capital in 1958 was a seminal contribution to the corporate finance literature and was followed by numerous publications building on their work.[76] The Modigliani/Miller theorem states that capital structure and dividend policy are irrelevant for the value of a company under certain conditions. This is so because the value of a firm is determined by its discounted future cash flows. These cash flows are discounted with the weighted cost of capital, which in turn are independent of the capital structure as they reflect the return required by investors from firms with a similar level of risk. An increase in leverage (more debt, less equity, lower capital/assets ratio), for example, would not reduce the weighted cost of capital because the effect would be offset by the

[74] Douglas W. Diamond and Philip H. Dybvig, 'Bank Runs, Deposit Insurance, and Liquidity', *Journal of Political Economy*, 91.3 (1983), 401–19.
[75] Revell, *Solvency and Regulation of Banks*, p. 15.
[76] Franco Modigliani and Merton H. Miller, 'The Cost of Capital, Corporation Finance and the Theory of Investment', *The American Economic Review*, 1958, 261–297.

higher cost of equity capital.[77] Consequently, capital ratios should be randomly distributed among companies and sectors. If so, however, why do banks have much lower capital to assets ratios than other sectors? And why do banks set ambitious goals for their return on equity (ROE), aiming at increasing the wealth of their shareholders by increasing the ROE through higher leverage?

The answers lie in the multiple assumptions made by the Modigliani/Miller theorem: no taxes, no bankruptcy costs (costs for financial distress), no asymmetric information, no transaction costs, no regulation, and an efficient market. Most contributions to corporate finance scholarship that build on the Modigliani/Miller theorem have focused on the consequences of relaxing these assumptions. In this sense, the theorem's limitations are its virtue: changing the assumptions creates a better understanding of why capital/assets ratios are not simply randomly distributed. Or to use the words of Merton Miller: 'showing what doesn't matter can also show, by implication, what does'.[78]

The following paragraphs explore the frictions that weaken the statement of capital structure irrelevancy. The deviations from the Modigliani/Miller theorem represent the major theories explaining the capital choices of firms.[79] Moreover, a section discusses the relevance of these theories for a historical narrative.

Trade-off theory

Relaxing the assumptions regarding taxes and financial distress changes the optimal capital structure. In fact, in a follow-up publication in 1963, Modigliani and Miller included corporate taxes in their theorem.[80] If interest payments on debt are tax-deductible and

[77] See Modigliani and Miller, proposition I (p. 268): $V_i \equiv (S_j + D_j) = \bar{X}_j / \rho_k$, where the market value of any firm *j* (V_j; market value of debt S_j; market value of shares D_j) is equal to the capitalised expected return ($\bar{X}_j$) at rate ρ_k. This can also be stated as the firm's average cost of capital: $\frac{\bar{X}_j}{S_j + D_j} \equiv \frac{\bar{X}_j}{V_j} = \rho_k$. Thus, a firm's cost of capital ($\bar{X}_j / V_j$) is independent of the capital structure. Proposition II (p. 271) states that that the expected return on equity i_j equals the capitalisation rate ρ_k plus a financial risk premia ($\rho_k - r$) times the leverage (D_j / S_j): $i_j = \rho_k + (\rho_k - r)\frac{D_j}{S_j}$. For the inclusion of corporate taxes, see also: Franco Modigliani and Merton H. Miller, 'Corporate Income Taxes and the Cost of Capital: A Correction', *The American Economic Review*, 1963, 433–43.

[78] Merton H Miller, 'The Modigliani-Miller Propositions After Thirty Years', *Journal of Economic Perspectives*, 2.4 (1988), 99–120 (p. 100).

[79] For a more extensive theoretical overview see Milton Harris and Artur Raviv, 'The Theory of Capital Structure', *The Journal of Finance*, 46.1 (1991), 297–355.

[80] Modigliani and Miller, *Corporate Income Taxes and the Cost of Capital: A Correction*.

dividends are not, there is an incentive to substitute equity with debt.[81] The weighted average cost of capital can be stated as follows:

$$WACC = \frac{E}{E+D}(r_e) + \frac{E}{E+D}(r_d)(1-t),$$

Formula 1: Weighted Average Cost of Capital

E denotes the market value of equity, *D* is the market value of debt, r_e the cost of equity, r_d the cost of debt and *t* the tax rate. Taxes reduce the cost of debt (r_d). Increasing the share of debt ($\frac{E}{E+D}$) and reducing the share of equity therefore reduces the weighted average cost of capital.

According to the WACC-formula, the cost of capital would be the lowest with a debt ratio of 100%. According to the trade-off theory, however, the increasing indebtedness leads to a higher potential cost of financial distress (bankruptcy costs).[82] As a result, there is an equilibrium at which the expected costs of financial distress offset the benefits of the tax deductibility. Bankruptcy costs do also explain why banks with low capital ratios are more vulnerable to shocks on assets (economic distress) than better-capitalised banks. Even though two banks might hold identical assets, the costs for financial distress increase proportionally much more at the highly leveraged bank because the risk of insolvency rises with deteriorating equity.[83]

Agency costs and their impact on the trade-off theory

Ben Bernanke used the analogy of a dagger in the steering wheel of a car to discuss the costs and benefits of high leverages.[84] With the dagger pointed at the chest of the driver, even a small accident could be fatal, the potential costs high. The advantage of the dagger, however, is that it incentivises careful driving. But how long should the dagger be – or how high the leverage? Agency theories propose both higher or lower leverages. The central idea in agency theories about capital structures is to include agency costs into the trade-off model. Agency costs exist because each of the different interest groups

[81] In a later publication, Miller also included personal taxes. If the taxes on the income from shares are lower than on the income from bonds, this would lower the expected return on equity and make equity financing more attractive. According to Miller, the tax advantage of debt for the firm can be neutralised by the tax disadvantage of debt for persons. See Merton H. Miller, 'Debt and Taxes', *The Journal of Finance*, 1977, 261–275.
[82] See Alan Kraus and Robert H. Litzenberger, 'A State-Preference Model of Optimal Financial Leverage', *The Journal of Finance*, 28.4 (1973), 911–22. and Miller, *Debt and Taxes*.
[83] Berger, Herring, and Szegö, *The Role of Capital in Financial Institutions*, p. 396.
[84] Ben S. Bernanke, 'Is There Too Much Corporate Debt?', *Business Review*, 1989, 3 (p. 11).

– management, shareholders, and creditors – do not necessarily act in each other's best interests.

The agency problem between shareholders and management points towards higher leverage. According to this theory, excess cash flow can lead to bad investment decisions by the management. High leverage requires high debt service, which could in turn, discipline the management as the risk of default is higher. Moreover, the participation of the managers in a firm creates incentives to reduce moral hazard issues that arise from the principal-agent relationship between the shareholders and the managers.[85]

The agency theories on shareholders and creditors, however, favour lower leverages. A high capital/assets ratio reduces the likelihood that creditors will be expropriated by the shareholders. A highly leveraged firm (low capital/assets ratio), for example, might avoid risky future investments (real options) which would positively contribute to the firm's market value. Thus, there is a trade-off between suboptimal future investments and the tax advantages of debt.[86]

Pecking order theory

The transaction costs of raising capital differ. Issuing new equity certainly comes at a high price, as for example underwriting fees or costs for the prospectus and marketing have to be covered (flotation costs). Raising additional debt through loans or deposits might involve lower transaction costs for a bank. Myers and Majluf suggested a pecking order theory to explain exactly these financing decisions.[87] The easiest and cheapest way for companies to finance their businesses is through cash flows. This source of internal financing has no issuing costs. When it comes to external financing, debt capital is preferred to capital because the issuing costs are usually lower. As Berger et al. outline, these factors might be even more important for small banks because they are usually confronted with higher transaction costs when it comes to issuing equity.[88]

[85] Michael C. Jensen and William H. Meckling, 'Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure', *Journal of Financial Economics*, 3.4 (1976), 305–60 (p. 308). Michael C. Jensen, 'Agency Costs of Free Cash Flow, Corporate Finance, and Takeovers', *American Economic Review*, 76.2 (1986), 323–29.
[86] Stewart C. Myers, 'Determinants of Corporate Borrowing', *Journal of Financial Economics*, 5.2 (1977), 147–75 (p. 149).
[87] Stewart C. Myers and Nicholas S. Majluf, 'Corporate Financing and Investment Decisions When Firms Have Information That Investors Do Not Have', *Journal of Financial Economics*, 13.2 (1984), 187–221.
[88] Berger, Herring, and Szegö, *The Role of Capital in Financial Institutions*, p. 398.

Signalling theory

Working with asymmetric information is at the very heart of banking. Commercial banks, for example, are specialised in assessing creditors and pricing credit according to the risks implied. This private information is an advantage compared to financial markets: banks know their expected income streams better than their investors. Therefore, the choice of a capital level is also a signal to the market about expected future business activities. A bank with high leverage might signal the high quality of their credit portfolio and their expectation of sound performances in the future. As a result, the value of a bank increases with lower capital/assets ratios as the 'market's perception of value' increases.[89] Moreover, the announcement of a capital raise itself is also a signal. According to the signalling theory, issuing new shares is a negative sign showing that the management has assessed the firm's prospects (investment opportunities) negatively. A firm with positive prospects would not issue new equity capital. It would not want its existing shareholders to share the benefits of their future investment opportunities with new shareholders. The share prices would raise more if the profits are distributed over a smaller share capital. Consequently, debt offerings are seen as a positive signal, equity offerings as a negative signal.[90]

Market timing theory

The basic idea behind market timing theories is that the decision to issue fresh equity capital depends on stock performance. If prices are high, managers decide to issue new equity.[91] A side effect of issuing equity in periods of high stock prices is the prospect of a high premium on the nominal value of the share. The premia can then be allocated to the reserves.

Using Corporate Finance in a Historical Context

The basic theories on capital structure provide a framework for analysing firms' debt and equity choices. But are these corporate finance theories suitable for analysing historic

[89] Stephen A. Ross, 'The Determination of Financial Structure: The Incentive-Signalling Approach', *The Bell Journal of Economics*, 8.1 (1977), 23–40 (p. 23).
[90] Ross, *The Determination of Financial Structure*. See also Hayne E. Leland and David H. Pyle, 'Informational Asymmetries, Financial Structure, and Financial Intermediation', *The Journal of Finance*, 32.2 (1977), 371–87.
[91] Deborah J. Lucas and Robert L. McDonald, 'Equity Issues and Stock Price Dynamics', *The Journal of Finance*, 45.4 (1990), 1019–43; Robert A. Korajczyk, Deborah J. Lucas, and Robert L. McDonald, 'Equity Issues with Time-Varying Asymmetric Information', *The Journal of Financial and Quantitative Analysis*, 27.3 (1992), 397–417.

developments? And if so, what are the lessons that can be applied to a historical narrative?

First of all, it has to be emphasised that modern finance literature only emerged during the second half of the 20th century. In 1952, Harry Markowitz introduced the idea of diversified portfolios, with investors minimising risk and maximising return.[92] Markowitz's portfolio theory became one of the cornerstones of finance literature, analysing the supply side of capital (investment management). Only a couple of years later, Modigliani and Miller laid the groundwork for discussing the optimal capital structure, which dealt with the demand side of capital (corporate finance). From the 1960s onwards, a third important leg of the finance literature then linked the demand and supply side of capital: the Capital Asset Pricing Model (CAPM) developed in the contributions of Treynor, Sharpe, Lintner, and Mossin introduced the concept of the cost of equity (and respectively the expected return on equity), which rewards an investor for systematic (undiversifiable) risk.[93]

The publications above represent the central contributions to finance literature and mark the 'mathematisation' of the discipline. Before the 1950s, finance was mainly a 'literary' subject. With the introduction of mathematics, modelling, and statistics as techniques for analysis, finance paralleled the development of economics – even though it lagged behind by about a decade.[94] Given this revolution in the academic literature, can its models be used as a framework for the analysis of developments that happened prior to their introduction?

In the author's opinion, the corporate finance theories provide ideas but are of limited use as frameworks for detailed historical analyses over a long period. The underlying knowledge of risks, returns, and capital structures changed enormously over two

[92] Harry Markowitz, 'Portfolio Selection', *The Journal of Finance*, 7.1 (1952), 77–91.
[93] Jack L. Treynor, 'Toward a Theory of Market Value of Risky Assets (Unpublished Manuscript)', in *Asset Pricing and Portfolio Performance: Models, Strategy, and Performance Metrics. 1999*, ed. by Robert A. Korajczyk (Risk Books, 1962). William F. Sharpe, 'Capital Asset Prices: A Theory of Market Equilibrium under Conditions of Risk', *The Journal of Finance*, 19.3 (1964), 425–42. John Lintner, 'Security Prices, Risk, and Maximal Gains From Diversification', *The Journal of Finance*, 20.4 (1965), 587–615; John Lintner, 'The Valuation of Risk Assets and the Selection of Risky Investments in Stock Portfolios and Capital Budgets', *The Review of Economics and Statistics*, 47.1 (1965), 13–37. Jan Mossin, 'Equilibrium in a Capital Asset Market', *Econometrica*, 34.4 (1966), 768–83.
[94] Morgan outlines that mathematics were introduced in economics in the 1930s. From the 1940s onwards, mathematics, modelling and statistics began to dominate the discipline as tools. Mary S. Morgan, 'Economics', in *The Cambridge History of Science: Volume 7, The Modern Social Sciences*, ed. by Roy Porter, Theodore M. Porter, and Dorothy Ross (Cambridge: Cambridge University Press, 2003), p. 277.

centuries. Even if banks and investors acted rationally, they could only act according to a given amount of knowledge at the time. Additionally, it is likely that models of finance changed the practice of finance itself. Models became an engine that altered financial markets and the behaviour of their actors, rather than simply mimicking them, as MacKenzie argued in 'An Engine, Not a Camera'.[95] Therefore, the reasoning for choosing one capital structure or another changed over time. The historical narratives in Chapters 4 to 6 allow us to incorporate changing ideas of what an optimal capital structure meant at different times.

Applying Corporate Finance Theories in Banking

Apart from the methodological limitations outlined above, the corporate finance literature based on Modigliani and Miller has another deficiency. The theories introduced above are general frameworks and do not specifically deal with banks, whose funding does not only consist of simple loans, bonds, and capital from shareholders. Rather, banks are funded to a large extent by depositors – a source of funding which is different to other debt instruments such as loans or bonds. Deposits usually come with a short-term maturity, as they can be withdrawn. They are often subject to specific legislation, such as deposit insurance or deposit protection schemes. If the costs for the insurance/protection scheme do not reflect each bank's individual risk, this might be an additional incentive for taking on more risk.

The restrictions discussed above ultimately lead to the question of whether the Modigliani/Miller theorem is applicable to banks at all. Merton Miller himself discussed the question in a short article in the *Journal of Banking and Finance* in 1995 and answered with 'yes and no.'[96] No, because Miller acknowledges the differences between bank debt and 'ordinary' debt of companies. Yes, because Miller emphasises that there are also various similarities. Indeed, insured deposits and ordinary securities do have common characteristics. Miller assumes that the role of a government is comparable to that of a private creditor. If the government insures deposits either explicitly (via deposit insurance) or implicitly (through a too-big-to-fail doctrine), it acts (in the optimal case) similarly to a private creditor: it monitors the debtors' business activities in order to avoid default on the loan, and correspondingly also the deposits; it imposes certain minimal capital thresholds (as often seen in the conditionality of loans); it controls the pay-outs to

[95] Donald A. MacKenzie, *An Engine, Not a Camera: How Financial Models Shape Markets*, Inside Technology (Cambridge, MA: MIT Press, 2006).
[96] Merton H. Miller, 'Do the M & M Propositions Apply to Banks?', *Journal of Banking & Finance*, The Role of Capital in Financial Institutions, 19.3–4 (1995), 483–89 (p. 483).

shareholders so that the company under surveillance remains above a certain minimum capital ratio.[97] Taking Miller's argument further means that the role of monitoring the credit risk is shifted from the depositor to the government if bank deposits are insured, whereas, in the case of other debt securities, both the risk and the monitoring of it are borne and executed by the same party.

Lessons from the Corporate Finance Literature

As pointed out above, the corporate finance literature shows what does not matter as well as what does. Even though corporate finance is not used as a framework of analysis, there are five key points that should be kept in mind going forward. First, the tax-deductibility of interest on debt is a strong incentive for higher leverages. Second, different costs for funding have to be taken into account. Following the pecking order theory, internal financing by retaining profits would be the first choice. Raising debt from investors and depositors would be only second priority and issuing stocks would be the last priority. In the banking context, however, insured deposits might be even more preferable than ordinary loans. Third, a low capital/assets ratio does not necessarily mean a bank is vulnerable. Considering the risks of its assets, a bank might also signal strength to its investors. An essential condition for this is stable profits, and hidden reserves are the key tool for managing income volatility. Fourth, banking practice is full of asymmetric information. Depending on the interest group – management, shareholders, or creditors – high leverage can be preferable or not. Finally, the timing of capital issuances might be of interest. According to the timing theory, banks would only issue new shares if they can realise high share premia and augment their reserves.

This chapter has outlined what the role of capital is, how it is defined, how capital adequacy can be measured, and discussed the major corporate finance theories on capital. The chapter emphasises that issues, such as hidden reserves and shareholder liability, should be considered. Moreover, it showed that there is not one single capital ratio to assess capital adequacy. Contemporaries used, for example, capital/deposits, capital/liabilities, or risk-weighted/assets ratios. For reasons of consistency, the capital/assets ratio will be used in the following chapters to trace capital from a historical perspective. The next chapter presents first insights into capital/assets ratios from the mid-19th century to the present and sheds light on several issues that were identified in this chapter.

[97] Miller, *Do the M & M Propositions Apply to Banks?*, p. 487.

3. Evolution of Capital/Assets Ratios

This chapter describes the evolution of capital/assets ratios in the long run. The goal is to provide a more accurate and differentiated view on capital/assets ratios. Section 3.1 presents capital/assets ratios from banks in four countries from 1840 to 2014. The focus of the comparison between the countries will be on common patterns and turning points rather than differences, as underlying definitions of banks and capital, as well as accounting standards, vary a lot. Identifying trend reversals allows the identification of important moments in the evolution of capital/assets ratios, which is crucial given the long timeframe. The two World Wars will be presented as central stages. They act as brackets, separating the research period into time frames: pre-World War I, wartime, and post-World War II.

Additionally, the problems of constructing time series covering capital/assets ratios will be discussed. While the time series presented in this chapter are the same that have often been used by the existing literature, addressing the deficiencies of these time series is something this literature has rarely attempted.

Section 3.2 broadens the definition of the capital/assets ratios. Do the capital/assets ratios still appear to have decreased if the risks of the assets are considered? A simple Basel I methodology is applied in a historical context to adjust for the degree of risk. As such calculations require detailed balance sheet data, only British and Swiss banks are analysed in this part. The aim of the exercise is to show that decreasing capital/assets ratios are not simply the result of structural changes on the assets side but can be observed even after accounting for such structural differences.

Sections 3.4 and 3.5 consider other forms of capital. There are two significant aspects of capital capable of substantially altering capital ratios: the ‘actual’ capital position of a bank can differ from the published figures because of hidden (undisclosed) reserves; additionally, extended shareholder liabilities can be viewed as a form of capital. Finding data on hidden reserves and extended liabilities capital is difficult. Thus, the chapter focuses on periods for which data was found in archives or was already available in the existing literature. For Switzerland, the chapter presents new data on hidden reserves and shareholders’ liability.

3.1. Bank Capitalisation Since 1840

Figure 2 shows the evolution of bank capital as a percentage of the total assets from 1835 to 2014 for Germany, the United Kingdom, the United States, and Switzerland. For the period up to the early 1880s, data is only available for Switzerland and the United States. The capital/assets ratios in both countries seem to have remained above the 30% threshold until 1871 (Switzerland) and 1873 (US). In the subsequent decade, the capital/assets ratios of both countries experienced a further decline, falling to the 20% level.

From the 1880s until the end of the First World War, the capital/assets ratios of all four countries fell rapidly. By 1918, the ratio stood at 9.3% in Germany, 13.1% in Switzerland, 5.5% in the United Kingdom, and 13.3% in the United States. During the war, the ratios fell by 7.1 percentage points (pp) in Germany, 1.9pp in Switzerland, 3.7pp in the United States, and 2.8pp in the United Kingdom (see Table 1). For Germany and Switzerland, there are also time series available for the group of Big Banks. The capital/assets ratio of the Big Banks in Berlin during the First World War fell by 12.5pp, dropping to 8.4% in 1918. In Switzerland, the ratio of the Big Banks fell to 14.9% (-5.2pp) between 1914 and 1918.

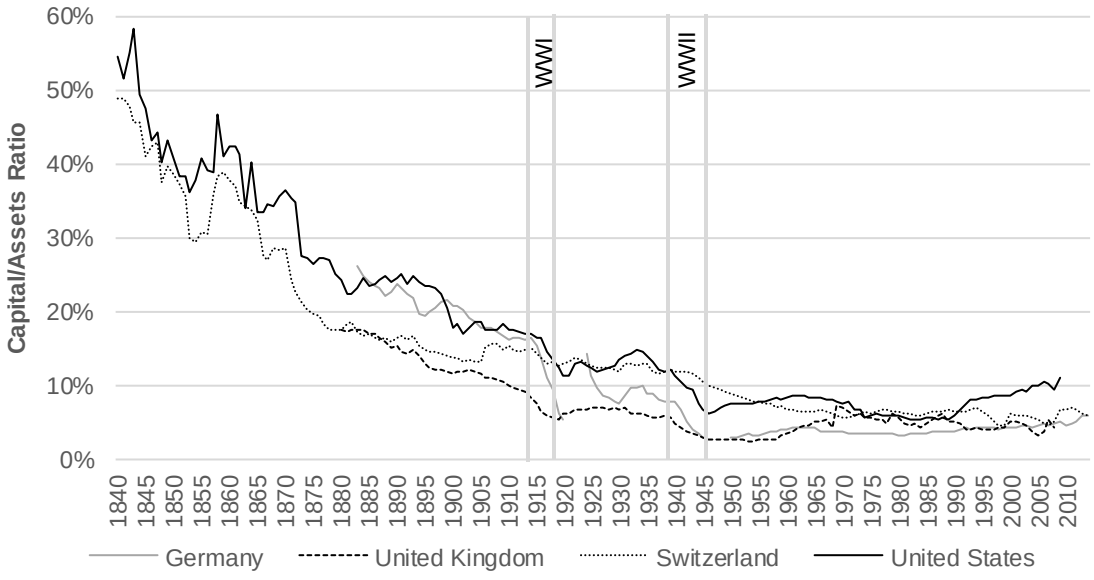

Figure 2: Capital/Assets Ratios, 1840-2014[98]

[98] Data and composition of time series: Germany: 1883-1920, Aktien-Kreditbanken and Hypothekenbanken (Deutsche Bundesbank, *Deutsches Geld- und Bankwesen in Zahlen*.); 1924-1945 and 1950-2014, all banks (Deutsche Bundesbank, *Statistics*.). England: 1880-1966,

	1914	1918	*Change in pp*	1939	1945	*Change in pp*
Germany	16.3%	9.3%	***-7.0***	7.7%	2.9%	***-4.8***
- Big Banks	*20.9%*	*8.4%*	***-12.5***	*n/a*	*n/a*	***n/a***
United Kingdom	8.3%	5.5%	***-2.8***	5.5%	3.0%	***-2.5***
Switzerland	15.0%	13.1%	***-1.9***	12.0%	10.4%	***-1.6***
- Big Banks	*20.1%*	*14.9%*	***-5.2***	*15.4%*	*11.0%*	***-4.4***
United States	17.0%	13.3%	***-3.7***	12.0%	6.7%	***-5.3***

Table 1: Capital/Assets Ratios During the First and Second World War[99]

During the interwar period (1918-1939), the capital/assets ratios in all four countries recovered to some extent. The ratios grew after the First World War and accelerated their growth during the years of the Great Depression. Towards 1939, the ratios started to decline again. They then deteriorated even more rapidly during the Second World War. In Germany, the ratios dropped by 4.8pp during the Second World War, in the United Kingdom by 2.5pp, in Switzerland by 1.6pp, and in the United States by 5.3pp.

Table 2 shows the change in percentage points between the beginning and end of each century. Most of the declines in the capital/assets ratios in Switzerland and the United States took place in the 19th century. In the 20th century, the decades covering the two World Wars contributed considerably to the downward shift. There were very few decades with a positive change in the capital assets ratios. Out of 17 decades presented for Switzerland and the United States, only five (Switzerland), or six (US) showed increasing capital/assets ratios. In Germany, six out of twelve decades show positive changes and in the United Kingdom, five out of thirteen. For the latter two countries, however, there is almost no aggregated data for the 19th century.

all banks (David K. Sheppard, *The Growth and Role of UK Financial Institutions, 1880-1962* (London: Methuen, 1971).; 1967-1978: Big Four (data obtained from individual annual reports); 1979-1983, clearing banks (Revell, *Costs and Margins in Banking: Statistical Supplement*.); 1984-2008, all banks (OECD, *Income Statement and Balance Sheet Statistics* (Paris: Organisation for Economic Co-operation and Development, 13 April 2010) <http://www.oecd-ilibrary.org/content/data/data-00270-en> [accessed 8 December 2015].). Switzerland: 1835-1905, note-issuing banks (Jöhr, *Die Schweizerischen Notenbanken*.); 1906-2008, all banks (Swiss National Bank, *Historical Time Series*.). United States: 1835-1970, all banks (United States. Bureau of the Census, *Historical Statistics of the United States. Colonial Times to 1970*.); 1971-1979, commercial banks (Federal Deposit Insurance Corporation, *Historical Statistics on Banking*.); 1980-2009, all banks (OECD, *Income Statement and Balance Sheet Statistics*.)

[99] Data: see footnote 98.

Decade	Germany	Switzerland	United Kingdom	United States
1841-1850	n/a	-9.1	n/a	-15.1
1851-1860	n/a	7.1	n/a	1.4
1861-1870	n/a	-15.3	n/a	-5.8
1871-1880	n/a	-12.4	n/a	-12.1
1881-1890	n/a	-1.9	-2.1	1.9
1891-1900	-3.1	-3.3	-3.7	-8.0
1901-1910	-4.4	1.2	-1.6	-0.8
1911-1920	-10.9	-2.3	-3.9	-6.0
1921-1930	2.2	-1.1	0.7	2.6
1931-1940	0.2	0.1	-2.0	-3.6
1941-1950	-4.8	-3.1	-2.4	-2.8
1951-1960	0.9	-2.1	1.0	0.9
1961-1970	-0.3	-1.1	3.3	-0.7
1971-1980	-0.3	0.8	-1.1	-2.1
1981-1990	0.5	0.1	4.9	0.0
1991-2000	0.4	-0.5	0.2	2.9
2001-2010	0.4	-6.0	-5.2	-8.6

Table 2: Changes in Capital/Assets Ratio (in Percentage Points) from Beginning to End of the Decade, 1841-2010[100]

Compared to the other countries, the capital/assets ratio of the United States seems to have been the highest over most of the period covered. The capital/assets ratios in the United Kingdom, on the other hand, were for a long time comparably low. However, in the second half of the 20th century, there seems to have been less variation among the capital/assets ratios of the four countries. Finally, from the 1990s onwards, the capital/assets ratios of US banks increased substantially.

The evolution of capital/assets ratios as outlined above is confirmed by existing literature also for a broader set of advanced countries.[101] The next section will go beyond the actual presentation of the data and elaborate on the accuracy of the time series.

[100] Data: See footnote 98.
[101] As discussed in Section 1.1, the general evolution of capital/assets ratios is documented by existing literature. See for example: Grossman, *Other People's Money*; Grossman, *Unsettled Account*; Jordà and others, *Bank Capital Redux*.

3.2. The Problems of Constructing Long-Run Time Series

As discussed in Section 1.1, various authors have demonstrated the evolution over time of capital/assets ratios. However, few of them actually discuss the problems of constructing long-run time series showing capital ratios, a vital omission to address as there is a cascade of issues related to using long-run data. The first of these issues is that reliable time series covering capital/assets ratios for more than one century usually do not exist. For some years, there might be no data at all, or the data might be based only on a small number of banks. Moreover, long-run time series are usually constructed by merging different datasets – very often from different sources, many of which are in fact secondary sources, and obtaining the original source is not always possible. In addition, only a few sources provide a discussion of the methodology used in collecting and aggregating the data, despite the fact that identical definitions of capital and assets, for example, are a key condition for producing consistent data.

A further issue is that different datasets sometimes cover different banking groups. Finding datasets without such a selection bias, which still represent the whole banking market is difficult. Finally, the very method for calculating capital/assets ratios might vary. Where possible, the data presented in this thesis divides the total capital by the total assets of all banks. Consequently, the resulting ratios are skewed by big banks (automatically weighted by their size) with high amounts of total assets and capitals. The averages, therefore, do not represent the average ratio of all banks, but the capital/assets ratio of the banking market.

All the capital/assets ratios shown in Figure 2 suffer from the problems described above. For the United Kingdom and Germany, for example, there is no data available before 1890 and 1880 respectively. Moreover, for the United Kingdom, there is no data from 2009 to the present that shows the different components of capital.[102] The German dataset before 1920 only incorporates certain bank types: joint-stock banks (‘Aktien-Kreditbanken’) with a balance sheet total above one million DM and mortgage banks

[102] The Bank of England as a regulator defines subordinated debt as being part of the bank capital and does not publish data detailing the capital structure of banks. There is no item showing only shareholders’ equity and reserves in the official statistics. Bank of England, ‘Explanatory Notes - Banks’ Balance Sheets - Groups’ <http://www.bankofengland.co.uk/statistics/pages/iadb/notesiadb/Banks_bs_groups.aspx> [accessed 17 October 2017].

('Hypothekenbanken').[103] Other banking groups, most importantly the savings banks ('Sparkassen'), are neglected.

Similar problems exist in the case of Switzerland. The time series from 1840 to 1906 consists of note-issuing banks only, which were usually regionally active banks with a primary focus on mortgage lending and receiving savings from customers (apart from note-issuing). Two important types of banks, however, are missing: small savings banks and large joint-stock banks providing credit to industry, railroads and trade are – with one exception – not represented in the figures.[104] The former group consisted of savings clubs ('Vereine') or later as cooperatives, the latter group were joint-stock banks. The different legal set-up brought different forms of liabilities for members or shareholders, which affected the capital/assets ratios. Savings clubs, for example, very often had only a low capital or no capital at all.[105] Joint-stock banks, on the other hand, usually had comparably higher capital/assets ratios. The time series for Switzerland is therefore not fully representative for the banking market: only 7% (measured in number of banks) or 37% (measured in total assets) of the bank population is covered from 1840 to 1906.[106] Given these numbers, small banks are underrepresented in the time series until 1906.[107]

Comparable problems appear with the time series of banks in the United Kingdom. Until 1968, the time series covers joint-stock banks only. The banking model of private banks is not represented in the time series, even though private banks (based on partnerships) were the standard banking model up until the 1830s, before the numbers of banks fell towards the beginning of the 20th century. With regards to joint-stock banks, however, the dataset is representative for the banking market. The data was collected and published by the Economist, listing each individual bank. And the banking market concentration increased heavily during the first two decades of the 20th century, leaving only a small number of banks to be analysed. From 1968 to 1983, the data consists of the by then 'Big Four' banks only, as the official statistics by the Bank of England did not

[103] The joint-stock banks consist of the Big Banks in Berlin ('Berliner Grossbanken') and Provincial Banks ('Provinzbanken'). See Deutsche Bundesbank, *Deutsches Geld- und Bankwesen in Zahlen*, p. 53. The data was first published in *Der Deutsche Oekonomist* and aggregated by the German Bundesbank.
[104] The 'Eidgenössische Bank' was part of the group of Big Banks and issued bank notes.
[105] Spyri, *Die Ersparnisskassen der Schweiz (1852-1862)*.
[106] Also, the number of banks in the sample only grows slowly. By 1840 there were four banks in the sample, eight in 1850, 17 banks in 1860 and 35 banks in 1900.
[107] See Adolf Jöhr, *Die Schweizerischen Notenbanken* and Franz Ritzmann, *Die Schweizer Banken : Geschichte, Theorie, Statistik*, Bankwirtschaftliche Forschungen (Bern: Haupt, 1973) for estimates on the number and total assets of all banks in Switzerland. Unfortunately, Ritzmann does not provide information about the capital of banks.

provide any details on bank capital.[108] This data was collected by the author. For the years after 1983, the data was taken from the OECD statistics.[109]

Another even more fundamental problem can be found in the British banking statistics of the 1960s and 1970s. Only the so-called 'statistical banks' in the United Kingdom were asked by the Bank of England to contribute their data to the Bank's statistical publications. The Bank of England defined statistical banks as on the so-called authorised list, the Schedule 8, and the Schedule 127 list (see Section 6.3.1).[110] Therefore, a substantial part of the market that had emerged during that time, the secondary banks, were not represented in any official statistics.

Finally, the time series for the United States supposedly consists of 'all banks' for most of the years covered. However, 'all banks' is not accurate, even though the term was used by the US Bureau of the Census. The original source of the data for the period until the end of the 19th century was the Comptroller of the Currency, which had an incomplete coverage of banks. Non-national banks were underrepresented.[111]

The shortcomings of long-run time series on capital/assets ratios are numerous, with only a select few of the possible examples listed above. Awareness of the problems of long-run data is therefore crucial when it comes to interpreting it, along with an understanding that the time series serve more as an approximation of the evolution of capital/assets ratios than as an exact measurement. Accordingly, in this thesis, the issues surrounding the measurement of capital/assets ratios are met on two levels.

On the one hand, the ratios are still used as a departing point for the analysis but are differentiated by looking at the balance sheet structures of banks, hidden reserves and extended shareholder liabilities, providing a more nuanced view on capital/assets ratios that will be presented in detail in the following sections. On the other, where necessary capital/assets ratios have been compiled directly from individual banks' balance sheets, as shown in later chapters.

[108] Barclays, Midland, Westminster, Llyods.
[109] Revell, *Costs and Margins in Banking: Statistical Supplement*; OECD, *Income Statement and Balance Sheet Statistics*.
[110] George Blunden, 'The Supervision of the UK Banking System', ed. by Bank of England, *Quarterly Bulletin*, Q2 (1975).
[111] For a detailed discussion of the original sources, see: United States. Bureau of the Census, *Historical Statistics of the United States. Colonial Times to 1970*, p. 1011.

3.3. Structural Changes in Balance Sheets

Are decreasing capital/assets ratios the result of structural changes in balance sheets? Did leverage actually increase if the risks on the asset side are considered? One way to address these questions is to make use of the Basel I framework.

In 1988, the member countries of the Basel Committee on Banking Supervision agreed on a common framework for the regulation of the capital adequacy of international banks. The Basel Capital Accord put forward a methodology which aimed to measure the credit risks of assets.[112] Each asset group carries a certain risk-weight. Cash and government securities, for example, were given a zero risk-weight. Investments in company shares carried more risk and were weighted with 100%. This process of risk-weighting led to a balance sheet total substantially lower than the non-risk weighted balance sheet. The capital requirements were set relative to the total of the risk-weighted assets (RWA) at a minimum of 8%, of which half had to be so-called core capital (equity capital and disclosed reserves).[113] The core capital is similar to the equity capital as defined in Section 2.1.

The Basel I accord was widely criticised for focusing exclusively on credit risk and using only one risk-weight per asset category.[114] Nevertheless, its methodology provides a simple method that helps to structure the different asset classes and to calculate the (assumed) risk of a balance sheet based on publicly available data. In the case of the United Kingdom, the data allows us to analyse the period from 1880 to 1966. For Switzerland, the available data covers the years from 1927 to 2008, as the Basel I simulation requires detailed information on the investment portfolio of the banks.

Table 3 shows the weights used for the calculations of the risk-weighted assets as defined by Basel I.[115] The methodology used in this thesis differs slightly from the Basel I approach because of limited data availability: off-balance-sheet items – which were

[112] Basel Committee on Banking Supervision, *Basel I*.
[113] The other 4% could consist of undisclosed reserves, revaluation reserves, general provisions, hybrid debt capital, and subordinated debt. Basel Committee on Banking Supervision, *Basel I*, pp. 3–8.
[114] See for example Giorgio P. Szegö, 'A Critique of the Basel Regulations, or How to Enhance (lm) Moral Hazards', in *Risk Management and Regulation in Banking* (Springer, Boston, MA, 1999), pp. 147–58.
[115] Classified according to: Basel Committee on Banking Supervision, *Basel I*, pp. 21–22. The terminology of the balance sheet items relates to that in the source material. For the United Kingdom: Sheppard, *The Growth and Role of UK Financial Institutions*, p. 118. For Switzerland: Swiss National Bank, *Historical Time Series*.

partially included in the Basel Accord – were not considered. With regards to the capital, the calculations below only incorporate shareholder capital and disclosed reserves (defined as Tier I in Basel I). Other forms of capital according to Basel I (hidden reserves, subordinated debt, defined as Tier II) are not included. For Switzerland, such a historical Basel I simulation is done for the first time. For British banks, Billings and Capie already produced a similar analysis.[116]

Asset	Risk-Weight	United Kingdom	Switzerland
Cash and Government Investments	0%	Cash, treasury deposit receipts, treasury bills, government investments	Liquid assets, government investments[117]
Short-term Investments	20%	Money at call, discounts	Money market papers, claims against banks
Mortgages	50%		Mortgage claims
Other Investments, Discounts, Loans	100%	Non-government investments, loans and other accounts, premises and other assets	Claims against customers, securities & precious metals, financial investments, participations, tangible assets, other assets

Table 3: Categorisation of Balance Sheet Assets According to Basel I Risk-Weights[118]

Figure 3 shows the capital/assets ratios of banks in the United Kingdom from 1880 to 1966 and Switzerland from 1906 to 2008. The dotted lines represent the capital as a percentage of the risk-weighted assets. In each country, the risk-weighted ratios and the unweighted ratios developed mostly parallel to each other. In certain periods, however, the capital/risk-weighted assets ratio shows higher variation than the capital/assets ratios. In the United Kingdom, for example, the capital/assets ratio of banks fell by 2.3 percentage points to 5.2% between 1939 and 1945. At the same time, the capital/risk-weighted assets ratio grew by 1.4 percentage points. The reason for this can be found in the changing composition of assets. In 1939, the banks did not yet hold British treasury deposits, whereas in 1945, treasury deposits accounted for 30.7% of all assets. Meanwhile, government bonds increased from 21.4% to 23.4% of the total assets. Both

[116] Billings and Capie, *Capital in British Banking*.
[117] Government investments are bonds or debt register claims (‘Schuldbuchforderungen’) from the federal government, cantonal governments, municipalities, and the Swiss Federal Railways, or loans to the respective entities.
[118] Basel Committee on Banking Supervision, *Basel I*, pp. 21–22.

treasury deposits and government bonds are weighted with zero percent, leading to an increase in the capital/risk-weighted assets ratio.

The time series on Switzerland show similar patterns. The capital/assets ratio fell by 1.5 percentage points between 1939 and 1945, whereas the capital/risk-weighted assets ratio slightly increased. As in the United Kingdom, these changes were directly related to government investments. By 1939, 4.6% of the balance sheet total of Swiss banks were loans to the government, government bonds or government debt register claims ('Schuldbuchforderungen') held by the banks. In 1945, government investments as a percentage of the balance sheet total reached 11.5%, equalling CHF 2.4 billion. In 1945, the Big Banks (CHF 883.8m) and the Cantonal banks (CHF 895.1m) held the largest amounts of these government investments. For the Big Banks, this meant that in 1945, 15.9% of their balance sheet total consisted of government investments.[119]

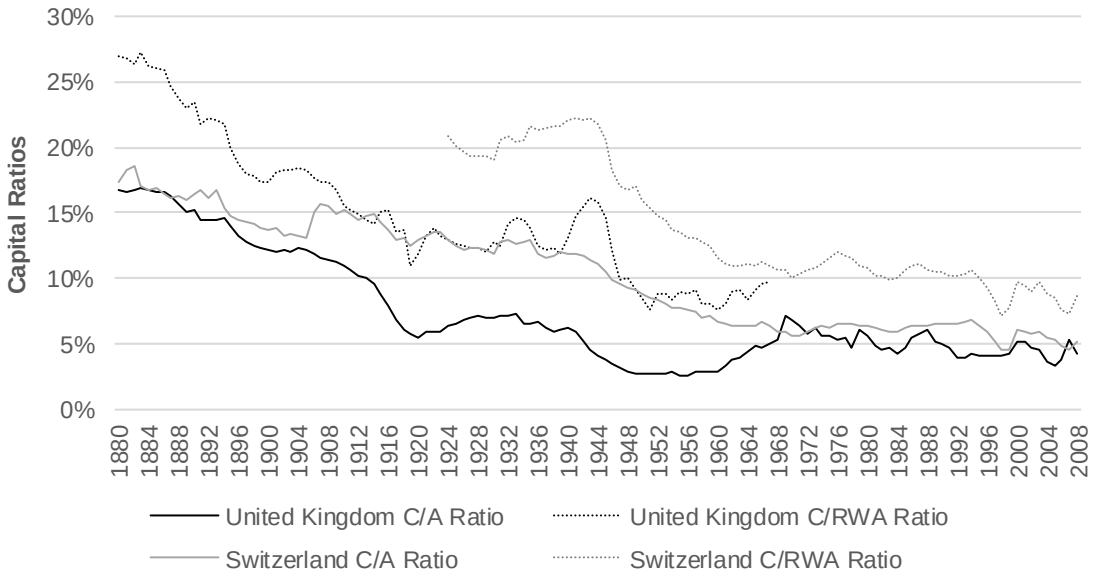

Figure 3: Capital in Percent of Total Assets and Risk-Weighted Assets in the United Kingdom and Switzerland, 1880-2008[120]

The Basel I methodology applied in this section might be considered as a crude approach to measuring structural changes on the asset side of a balance sheet. Nevertheless, it serves as a tool for categorising different asset classes over long periods. Even when the classical risk-weights of Basel I are applied, the capital ratios still show a clear

[119] Data on government investments: Swiss National Bank, 'Das Schweizerische Bankwesen 1946' (Orell Füssli, 1947), p. 128.
[120] Author's calculations based on Swiss National Bank, *Historical Time Series*. (Switzerland) and Sheppard, *The Growth and Role of UK Financial Institutions*. (UK).

downward trend. In other words, the overall evolution of capital/risk-weighted assets ratios was mostly parallel to that of the previously introduced capital/assets ratios. The features of the time series remain similar: there was a decline in capital ratios until the First World War and a period of recovery in the interwar period. The risk-weighted ratio only deviated from the trend of the capital ratio during the Second World War. After 1945, both ratios in the United Kingdom grew, whereas the ratios in Switzerland continued to decline. Section 5.1.1 provides a more detailed discussion of the build-up of government debt in bank balance sheets.

3.4. The Role of Hidden Reserves

The time series above are based on public figures that were usually published in annual reports. Undisclosed (hidden) reserves are not included as part of a bank's published capital, even though such reserves serve as buffers against losses, which is one of the primary functions of capital. Adjusting the capital for hidden reserves leads to higher capital/assets ratios. Moreover, the use of hidden reserves also distorts profits, as banks can lower or increase their profits by releasing or creating hidden reserves (if hidden reserves are unregulated).[121] In the United Kingdom, the use of hidden reserves was allowed until 1970.[122] In Switzerland, hidden reserves are still allowed, even though their use has been more restricted since the 1990s.[123] This leads to two questions: how much 'actual' capital did banks hold? And how does it affect the capital/assets ratio?

Academic literature on hidden reserves in the financial sector is sparse.[124] Capie and Billings offer the only long-run data on hidden reserves based on internal accounts from archives.[125] The authors provide time series of capital including hidden reserves from 1920 to 1970 for English banks. For Switzerland, no encompassing assessment of

[121] In Switzerland, the deviation from the real profits was probably very substantial. Between 1938 and 1945, the annually generated hidden reserves as a percentage of the published profit among the two banks Credit Suisse and Swiss Bank Corporation ranged between 8% and 81%. These deviations fluctuated strongly from one year to another, indicating the goal of providing stable profits and dividends. For England, Capie and Billings provide detailed figures from 1920 to 1968. See: Capie and Billings, *Profitability in English Banking*.
[122] Billings and Capie, *Capital in British Banking*, p. 141.
[123] Since 1990, the allocation or withdrawal of profits to/from hidden reserves has to be published (circular of the Federal Banking Commission, 25. September 1990). The revision of the Banking Ordinance of 1995 prohibited hidden reserves for holding companies (Banking Ordinance, 1. February 1995).
[124] For an overview on the regulation of hidden reserves at the end of the 1970s in eleven European countries, see: Becker and others, *Stille Reserven*.
[125] Billings and Capie, *Capital in British Banking*.

hidden reserves in banking has yet been made.[126] Despite this, there are several approaches available for estimating hidden reserves. One way is to analyse the annual reports of individual banks during years with large losses. If such losses were publicly known, but the annual profit did not fall, the banks must have covered the losses with hidden reserves. In a very few occasions, banks discussed the use of hidden reserves in the annual report. Apart from this 'case study approach', Swiss banking regulation provides an alternative method for estimating hidden reserves. From the 1960s onwards, banks could use their hidden reserves as a part of the capital which they were required to hold. In order to get hidden reserves approved as part of the required capital, auditors of banks had to submit a form confirming the extent of hidden reserves to the Federal Banking Commission. Some of these forms are accessible in the Swiss Federal Archive. On an aggregated level for the whole banking market, the Swiss National Bank also collected and published the data.

The next section presents estimates for hidden reserves in England and Switzerland. For England, the data is based on the work of Billings and Capie.[127] For Switzerland, new data obtained from archival material and the Swiss National Bank will be presented.

3.4.1. Hidden Reserves in England

Billings and Capie provide data on the extent of hidden reserves for six banks (Barclays Bank, Lloyds Bank, Martins Bank, Midland Bank, National Provincial Bank, Westminster Bank) from 1920 to 1968. On average, the capital including hidden reserves was about 61% higher than the published capital.[128] The capital/assets ratio including hidden reserves was 2.5 percentage points higher than the ratio without (minimum: 1.2pp.; maximum: 3.4pp.).

The public was aware of the extensive use of hidden reserves in banking. The *Journal of the Institute of Bankers*, for example, pointed out that 'It is, of course, common knowledge that all the large banks in England have written down their premises accounts

[126] Malik Mazbouri provides a brief overview of the role of hidden reserves in Switzerland. See: Malik Mazbouri, 'A Retrospective Illusion? Reflections on the "Longevity" of Swiss Big Banks 1850-2000', in *Immortal Banks: Strategies, Structures and Performances of Major Banks*, ed. by Michel Lescure (Genève: Librairie Droz, 2016), pp. 231–51.
[127] Billings and Capie, *Capital in British Banking*.
[128] Billings and Capie, *Capital in British Banking*, pp. 150–51.

to a fraction of their actual worth […]'.[129] Similarly, *The Economist* pointed out the existence of substantial hidden reserves in the 1920s:

> 'The banks, it must be remembered, have admittedly very large reserves, in addition to those figuring in the balance-sheets. During the past decade an enormous amount has been written off the book value of investments. The latter, mostly British Government securities, have greatly appreciated in value during the past two years, but, as far as we are aware, no bank has written up its investments. Here, therefore, is a very substantial 'hidden' reserve, to which may be added the fact that premises, from which large amounts have been steadily written off year by year, must be now worth a great deal more than the figures at which they appear in the balance-sheets.'[130]

The statement above is fairly representative of many others made in *The Economist's* Banking Supplement, mentioning the presence of undisclosed reserves in English banking as well as the potential use of such reserves to ensure stable dividend payments.

Figure 4 shows the capital ratios of each of the Big Five banks, including and excluding hidden reserves. Figure 5 presents the volume of hidden reserves as a percent of total assets. The hidden reserves of the Big Five Banks were growing until the late 1920s. They fell in the years 1927-1930 and 1932-1933, before recovering again afterwards. During the Second World War, the ratio of hidden reserves decreased, before entering yet another period of growth until the 1960s. These figures are fairly representative for the banking market in the United Kingdom for most of the time covered by the data below, as from 1920 onwards, the (originally English) Big Five banks had market shares in the UK banking market of between 80% and 90%.[131]

[129] Institute of Bankers, *Journal of the Institute of Bankers*, XXXIII (London: Blades, East & Blades, 1912), p. 2.
[130] 'Banking Supplement 1923', *The Economist* (London, 19 May 1923), pp. 1059–60.
[131] Depending on whether the calculations are based on deposits, total assets or number of branches. Author's calculations based on data from 'Banking Supplement, Various, 1861-1946', *The Economist*, 1946.

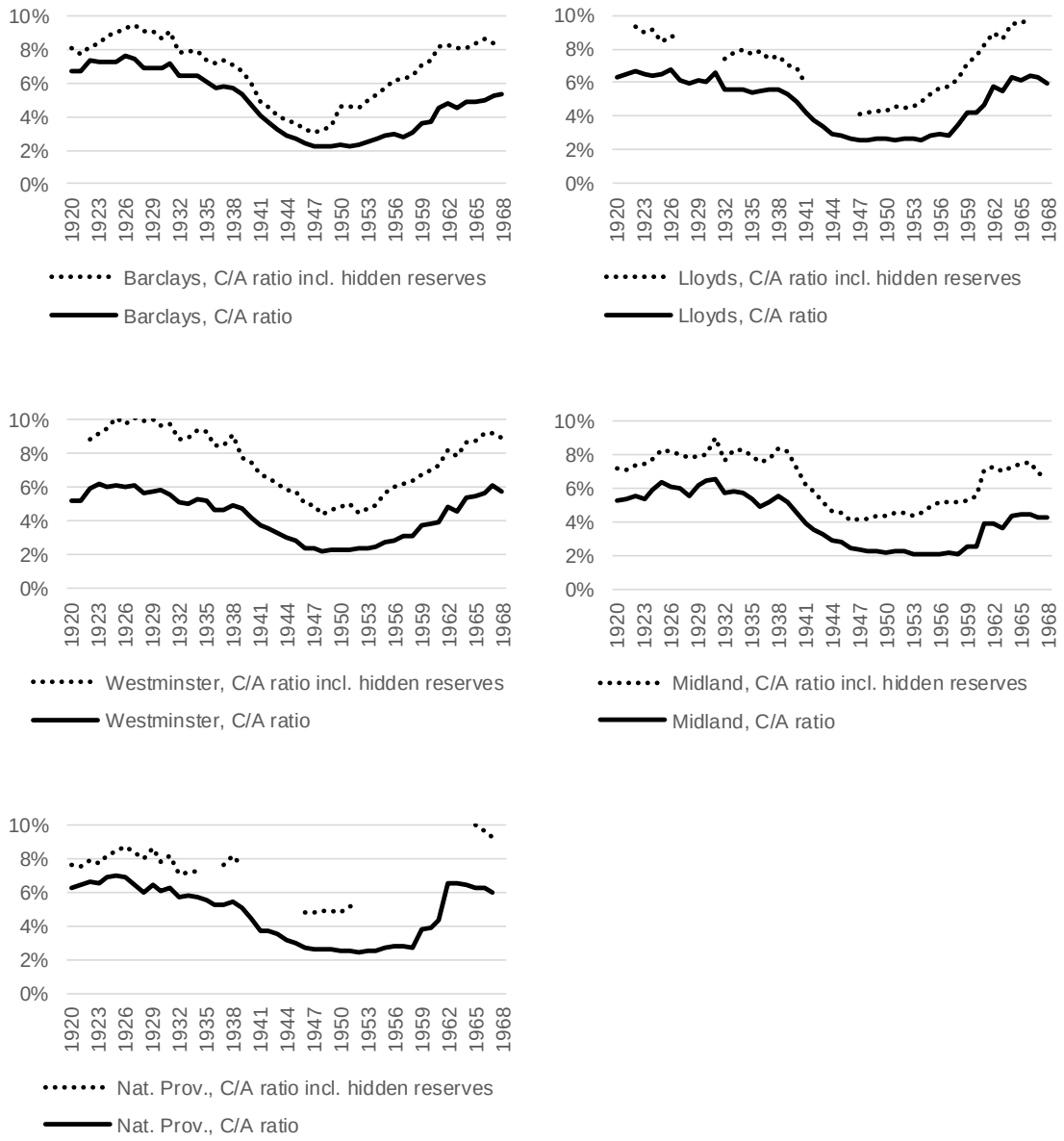

Figure 4: Published and 'Actual' Capital/Assets Ratios of the Big Five Banks, 1920-1967[132]

[132] Author's calculations, capital and assets from 1920-1945: 'The Economist Banking Supplement, Various, 1861-1946'.; capital and assets from 1946-1967 and 'actual' (internal) capital from Billings & Capie (2007), based on their 'capital measure 1', consisting of published capital plus hidden reserves.

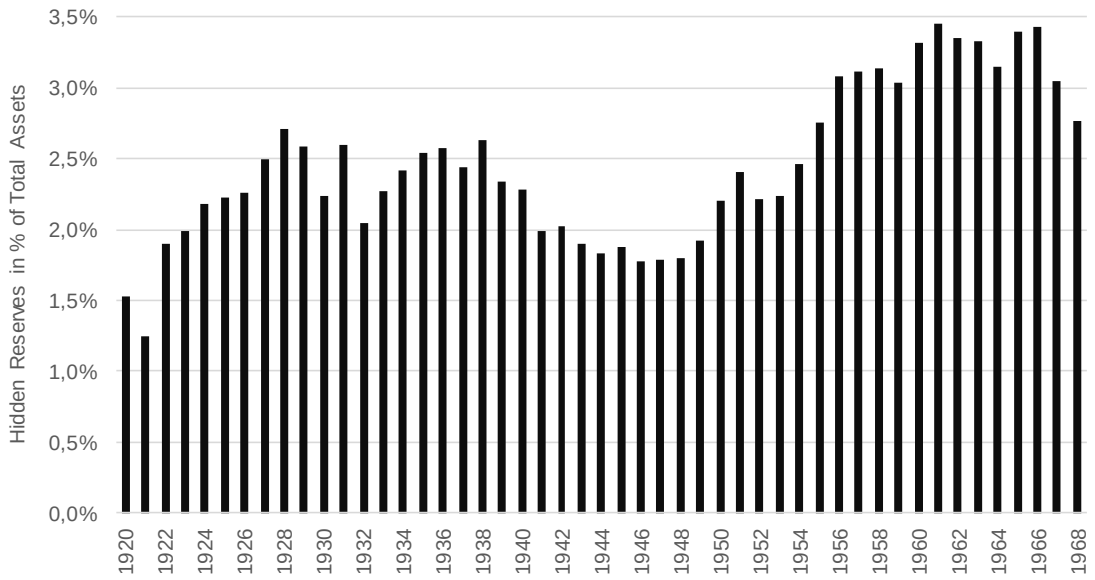

Figure 5: Hidden Reserves in Percent of Total Assets, Average of the Big Five Banks, 1920-1968[133]

3.4.2. Hidden Reserves in Switzerland

Getting access to the archives of Swiss banks to examine hidden reserves in a historical context is difficult. However, Swiss banking regulation allows for the possibility of bypassing that problem to some extent. In 1934, Switzerland introduced the first national bank regulations. The Banking Act required banks to hold an 'adequate' amount of capital, which was specified in the Banking Ordinance as a ratio of 5% or 10%.[134] The Banking Ordinance (i.e. capital regulations) were not revised until 1961. One major change in the regulation of capital in 1961 was that hidden reserves were allowed as part of a bank's required capital.[135] The practice of allowing hidden reserves as part of the required capital became more restricted again between 1990 and 1995. From 1990 onwards, the build-up of hidden reserves and respectively the reduction of hidden reserves in order to increase profits had to be disclosed in the annual reports (see also Section 6.1 for a more general analysis of Switzerland's banking regulation).[136]

[133] Author's calculations. Data: total assets 1920-1945, 'The Economist Banking Supplement, Various, 1861-1946'.; total assets 1946-1967 and hidden reserves from Billings and Capie, *Capital in British Banking*.
[134] *BankG 1934*. See Article 4.
[135] Eidgenössische Bankenkommission, *Circular*, 1961; Eidgenössische Bankenkommission, *Circular*, 1968. Hidden reserves could be only used as regulatory capital if they were taxed.
[136] Eidgenössische Bankenkommission, *Circular*, 1990.

According to Switzerland's capital regulations, the disclosure of hidden reserves was not mandatory. However, if banks wanted hidden reserves to be counted as part of their required capital, the banks' auditors would have to report them to the Federal Banking Commission in the official capital report ('Eigenmittelnachweis'). Consequently, the data on hidden reserves reported to the Federal Banking Commission is partially accessible in the archives and some reports from the Swiss National Banks are available.[137] Even though the exact amount of hidden reserves is not known, the reports can be used for a lower bound estimate.

Figure 6 shows the hidden reserves of all banks in Switzerland reported to the Federal Banking Commission as a percentage of the total assets (axis on the left, black bars) and the share that hidden reserves contributed to the required capital (right axis, grey line). From 1961 to 1967, the required capital could consist of a maximum of 15% hidden reserves. From 1968 to 1971, this limit was raised to 25% (see boxes in the graph). From 1972, the limit was removed. The motives for these changes and more broadly capital regulation itself will be discussed in Chapter 6. Banks made use of this opportunity but did not exploit it to the full. On average, they reported 5.4% (maximum allowed: 15%) of their required capital as hidden reserves from 1961 to 1967. From 1968 to 1971, the average was 11.3% (maximum allowed 25%) and from 1972 to 1994 14% (no limits).

Measured against the total assets, hidden reserves reported to the Federal Banking Commission stood at 0.3% (1961-1967), 0.6% (1968-1971) and 0.9% (1972-1994). The reported hidden reserves grew immediately after both regulatory changes in 1968 and 1972, indicating that the newly reported hidden reserves existed already before these changes.

[137] The data was also collected by the Swiss National Bank, which published it in their annual banking statistics from 1961 to 1994, aggregated for all banks, and on the level of individual bank groups from 1970 to 1994.

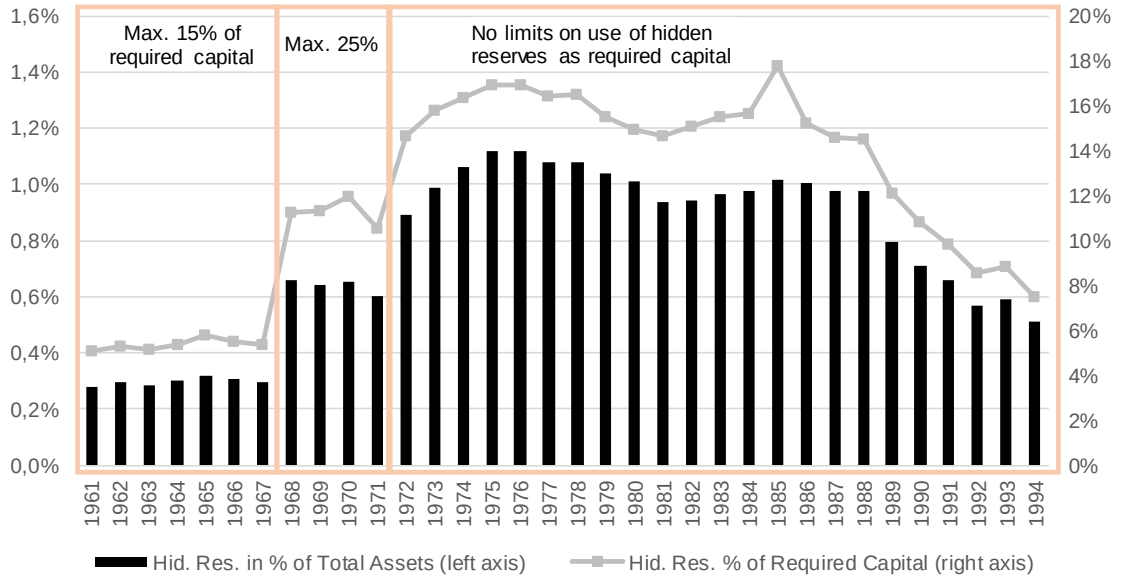

Figure 6: Hidden Reserves Reported to the Federal Banking Commission in Percent of Total Assets (Left Axis) and Hidden Reserves in Percent of Required Capital (Right Axis), All Swiss Banks, 1961-1994[138]

From 1970 to 1994, the statistics of the Swiss National Bank also contained information on the capital structure of individual bank groups. Moreover, the archive of the Federal Banking Commission holds individual capital reports submitted to the Banking Commission.[139] In order to develop a more accurate view on the true size of hidden reserves among Swiss banks, it is therefore interesting to look at the bank group which was struggling the most to fulfil the regulatory capital requirements. If a bank (or a whole group of banks) had problems in meeting capital requirements, it is likely that they reported all their hidden reserves to the supervisor.

The bank group that struggled the most to fulfil capital requirements was that of the Big Banks. Before hidden reserves were allowed for regulatory purposes in 1961, their regulatory capital was already below the required level. By 1960, the Big Banks lacked 16% of the required capital – therefore failing to meet capital requirements by a large extent. The Big Banks narrowly managed to fulfil the capital requirements for some subsequent years but fell below the requirements again in the first half of the 1970s (for a detailed analysis, see Section 6.2.2).

[138] The data was collected from various annual issues of: Swiss National Bank, 'Das Schweizerische Bankwesen / Die Banken in der Schweiz (annual issues 1906-2015)', various, 1906-2015 (2015). Eidgenössische Bankenkommission, *Anrechnung stiller Reserven als eigene Mittel* (Bern, 1966), Swiss Federal Archives, E6520A#1983/50#49*.
[139] See footnote 138.

Figure 7 displays the hidden reserves of the Big Banks as a percentage of total assets (bars, left axis) and the hidden reserves as a percentage of the required capital (grey line, right axis) from 1961 to 1994. The reported hidden reserves reached their high point in 1975 and 1976. In 1976, the reported hidden reserves amounted to 2% of the balance sheet total. The average of the hidden reserves held by Big Banks in the period of 1972 to 1994 was 1.2%, 0.3pp above the average of all banks. Even though the average of the reported hidden reserves of the Big Banks was much higher, it fell to a lower level towards 1994. The reason for this can be most likely found in regulatory changes and the real estate crisis that hit Switzerland in the early 1990s. The revision of the Banking Ordinance in 1995 finally prohibited hidden reserves on group/consolidated level, though still allowed it on single bank level. Furthermore, the real estate crisis at the beginning of the 1990s had led to losses among the Swiss banks of CHF 42.3bn, of which CHF 30.1bn was attributed to the Big Banks.[140] It is likely that the banks covered substantial amounts of these losses with hidden reserves, as the total volume of capital (including reserves) was increasing at the time and the profits were fairly stable.[141]

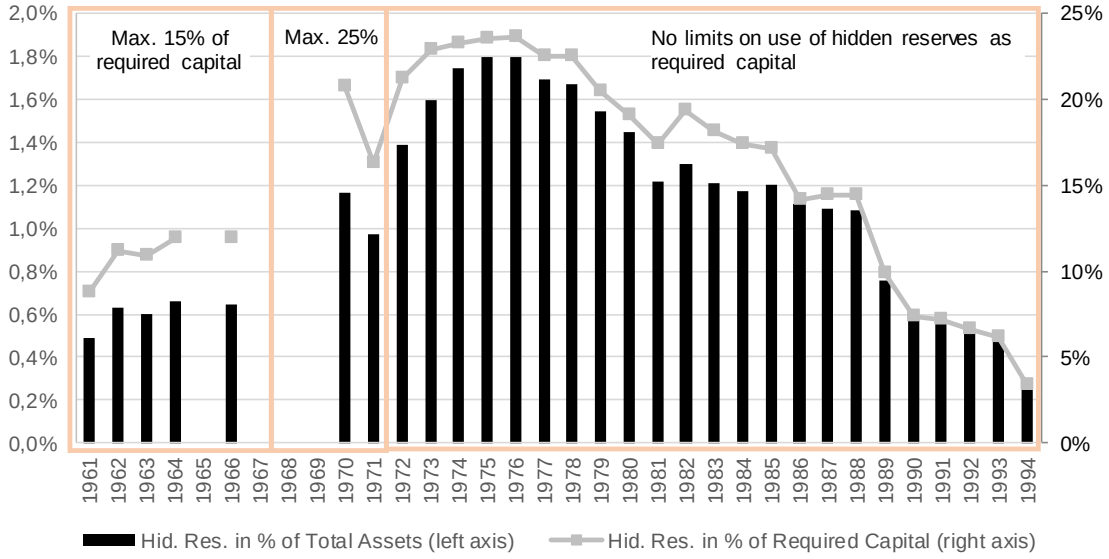

Figure 7: Hidden Reserves Reported to the Federal Banking Commission in Percent of Total Assets (left axis) and Hidden Reserves in Percent of Required Capital (Right Axis), Big Banks, 1961-1994[142]

[140] Eidgenössische Bankenkommission, *Jahresbericht 1997 der Eidgenössischen Bankenkommission* (Bern, April 1998), p. 16.
[141] See: Swiss National Bank, *Historical Time Series*.
[142] The data was collected from various annual issues of: Schweizerische Nationalbank SNB, 'Das Schweizerische Bankwesen / Die Banken in Der Schweiz', 1906-2015. and archival

Given the slim capitalisation of the Big Banks from a regulatory perspective during the 1960s and 1970s, the hidden reserves shown in Figure 7 are likely to be accurate, especially from 1972 onwards, when hidden reserves could be counted as part of the required capital without restrictions.

Figure 8 shows the capital/assets ratios for 'all banks' and the Big Banks with and without the estimate for hidden reserves. It indicates that the actual capital/assets ratios were substantially higher than the capital/assets ratios derived from published accounts. With regards to the whole banking market, the capital/assets ratio including hidden reserves was on average at least 0.8 percentage points higher than the published capital/assets ratio (1961-1994). For the Big Banks, the difference between the actual and the published capital/assets ratio was at least 1.2 percentage points for the period 1970-1994 (All Banks: 0.9%). Is 1.2 percentage points a lot? Compared to the profitability of the Big Banks at the time, hidden reserves at such a level would mean that banks could have shown stable profits to the public by releasing hidden reserves without actually making any profit at all (break-even) for about three to four years.

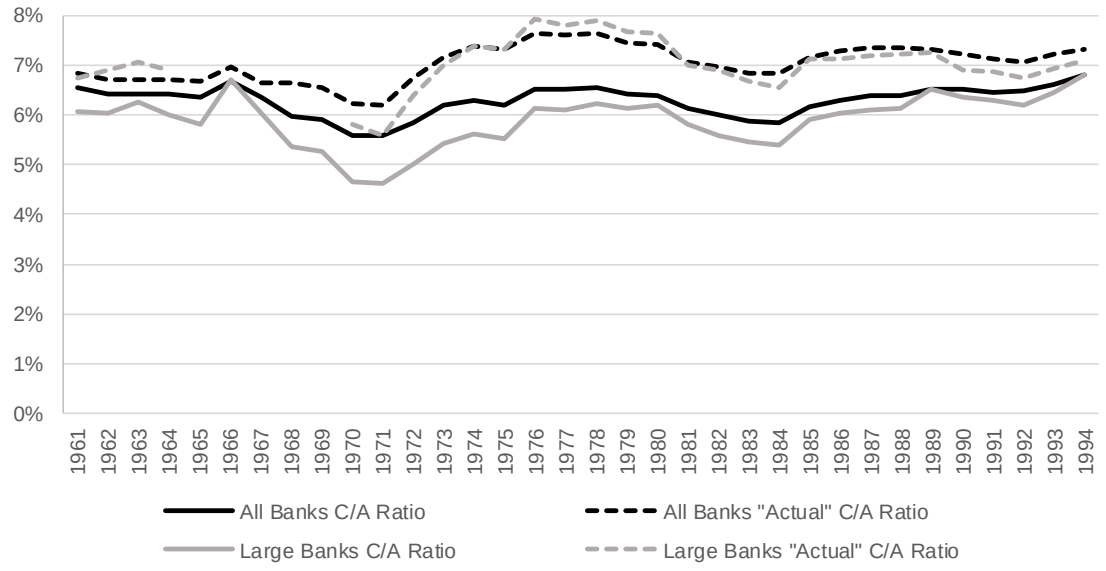

Figure 8: Capital/Assets Ratio Including and Excluding Hidden Reserves, All Banks and Big Banks, 1961-1994[143]

material from the Federal Banking Commission: Eidgenössische Bankenkommission, *Anrechnung stiller Reserven, SFA, E6520A#1983/50#49**.

[143] The data was collected from various annual issues of: Schweizerische Nationalbank SNB, 'Das Schweizerische Bankwesen / Die Banken in Der Schweiz', 1906-2015. and archival material from the Federal Banking Commission: Eidgenössische Bankenkommission, *Anrechnung stiller Reserven, SFA, E6520A#1983/50#49**.

An alternative approach to assessing the extent of hidden reserves is to analyse significant losses of individual banks. The so-called 'Chiasso Scandal' at Credit Suisse in 1977 proves to be an excellent example with which to test the accuracy of the estimates for hidden reserves made above. The bank invested capital from illegal sources in Italy in a trust in Liechtenstein (Texon Finanzanstalt). The trust's bad investments led to a loss of CHF 1.2 billion. At the time, Credit Suisse had a balance sheet total of CHF 44 billion, meaning that the total loss of CHF 1.2 billion was 2.7% of the total assets. As the bank noted, it could cover the loss only due to the 'inner strength' of the bank, which referred to a high amount of hidden reserves.[144] Indeed, the bank's (published) net profits even increased from CHF 201.4m in 1976 to 234.7m in 1977 and dividend payments remained stable. The officially published write-offs in 1977 amounted to CHF 455m (1976: 87.4m) and were covered by withdrawing hidden reserves of about CHF 430m.[145] The published reserves not only remained untouched to cover the losses, but they were even increased by another CHF 100m in the same year.

Credit Suisse's capital/assets ratio in 1976 was 6.3%. If the officially declared withdrawal of hidden reserves in 1977 had been added to that, the actual capital/assets ratio would have been about one percentage point higher. The calculations made above on the level of groups of banks led to a minimum estimate of hidden reserves for Big Banks in 1976 of 1.8% (of total assets). Therefore, it seems that the release of CHF 430m from hidden reserves, reflecting 1% of the bank's total assets, did not pose a serious problem for Credit Suisse.

[144] Schweizerische Kreditanstalt, *Jahresbericht Schweizerische Kreditanstalt 1976*, 1977, pp. 26–28.
[145] Schweizerische Kreditanstalt, *Jahresbericht Schweizerische Kreditanstalt 1976*, pp. 49–54; 58–63.

3.5. Extended Shareholder Liabilities

This section on extended forms of shareholder liabilities addresses liabilities that go beyond the initial amount that a shareholder invests in a company. In the absence of extended forms of liabilities, an investor is liable for the paid-up nominal value of a share only. The maximum potential loss is the price paid for the stock. With extended shareholder liabilities, the potential losses for investors can be much higher, either limited to a certain amount or even unlimited.

Under which circumstances can or must shareholders pay in more equity capital? This depends on the regulatory framework. First, a bank might be able to call up more capital based on a decision by the bank's management or the general assembly if needed. There are several reasons to call up additional capital, for example, to expand business activities or to recapitalise after losses and writing off a part of the capital. Secondly, capital can be called up if a bank is in liquidation. In that case, calling up capital is contingent on an event (bankruptcy). Given the limited or unlimited claim the bank has on its shareholders' wealth, it can be argued that such non-contingent or contingent claims are equity capital too. Thus, if shareholder liabilities are considered, the capital including the liability would be higher than the capital paid up by the shareholders. In consequence, the adjusted capital/assets ratio is higher than the published one. Including both shareholder liabilities and hidden reserves will lead to a closer estimate of the 'total capital strength' of banks.

Estimating the extent of the shareholder liability is straightforward if it is limited to a specific maximum (e.g. double liability, limited as an amount). If it is unlimited, the liability depends on the individual wealth of each shareholder, making the valuation of the liability almost impossible. In England, all banks could limit the shareholder liability from 1857 onwards, but most banks only changed to limited liability after the collapse of the City of Glasgow Bank in 1878. In Switzerland, unlimited liability is still allowed today for banks organised as cooperatives.[146] In practice, however, extended forms of liability lost their importance during the 19th century. There was only one banking group, the Raiffeisen banks, which made extensive use of unlimited liability until 1989 and limited liability until 2014.[147]

[146] Art. 869 & 870, *Bundesgesetz betreffend die Ergänzung des Schweizerischen Zivilgesetzbuches (Fünfter Teil: Obligationenrecht), (Stand am 1. April 2017)*, 1911.
[147] Raiffeisen Schweiz Genossenschaft, 'Geschäftsbericht der Raiffeisen Gruppe 2013', 2014, p. 54.

3.5.1. Shareholder Liability in England

By the mid-19th century, banks in England could operate under three different acts. While the acts of 1826 and 1833 did not allow banks to register with limited liability, it was compulsory under the Banking Act of 1844.[148] Most banks at the time, however, operated under the Banking Acts of 1826 and 1833.[149] It was not until 1857 that all English banks could register with limited liability, but only a few banks took the opportunity and changed their legal status.[150] The collapse of the City of Glasgow Bank in 1878 was a turning point. By 1874, about 20% of English deposits were held by banks with limited liability.[151] In 1880, only about every fourth bank still operated with unlimited liability. In 1885, almost all joint-stock banks were on limited liability.[152]

Most banks that changed to limited liability after the City of Glasgow failure created a 'reserve liability' based on the Companies Act of 1879. This reserve liability could be called up in case of bankruptcy.[153] Thus unlimited liability was replaced by a certain amount of uncalled capital and reserve capital. The former could be called up anytime, the latter only in the event of a bank failure. On the one hand, the reverse liability protected shareholders from unwanted and uncontrollable calls for capital from bank directors. Shareholders knew for which amount of total amount they were liable. On the other hand, a reserve was established for the depositors, signalling bank safety.[154] However, the transition from unlimited to limited liability banking raises the question of whether banks substantially increased their paid-up capital and reserves once they switched from one to the other regime. John Turner has shown that banks with limited

[148] The Banking Co-Partnerships Act, 1826, 7 Geo. IV, c. 46. Bank of England Act, 1833, Will IV, c. 98. Bank Charter Act 1844 (Act 7 & 8 Vict., c. 32)
[149] Arthur Meredith Allen and others, *Commercial Banking Legislation And Control* (London: Macmillan, 1938), p. 230.
[150] The Limited Liability Act of 1855 (18 & 19 Vict., c. 133) was extended to banks in 1857 (Joint Stock Companies Act of 1857, 20 & 21 Vict., c. 49)
[151] Graeme G. Acheson and John D. Turner, 'The Death Blow to Unlimited Liability in Victorian Britain: The City of Glasgow Failure', *Explorations in Economic History*, 45.3 (2008), 235–53 (p. 237).
[152] Less than 4% of English joint-stock banks had unlimited liability in 1885. Measured in deposits, these banks held less than 1% of all deposits in England and Wales. Author's calculations, data: 'The Economist Banking Supplement, Various, 1861-1946'.
[153] Companies Act of 1879, 42 & 43 Vict., c. 76, Section V. According to the Companies Act, banks could increase the nominal capital per share in case the capital was already fully paid up to create a reserve liability. Alternatively, a portion the uncalled capital could be defined as having reserve liability.
[154] On the perceptions of unlimited and limited liability in the 19th century, see: John D. Turner, "The Last Acre and Sixpence": Views on Bank Liability Regimes in Nineteenth Century Britain', *Financial History Review*, 16.2 (2009).

liability had substantially higher capital ratios than unlimited liability banks.[155] A look at journalistic articles at the time also shows that an increase of paid-up capital was also expected (see Section 4.2.1).

Richard Grossman and Masami Imai also show that uncalled capital and the reserve liability restrained the banks' risk-taking. English banks with higher amounts of uncalled capital and reserve liability tended to take less risk. Their loan portfolios grew more slowly and their assets were less risky.[156]

Assessing the value of the unlimited liability depends on the individual wealth of a bank's shareholders. Based on an analysis of the City of Glasgow's shareholder composition, Graeme Acheson and John Turner showed that the bank's shareholders were 'from the wealthier sections of society'.[157] Looking at the shareholders of four different banks in a separate study, Turner came to a similar result.[158] The same can be concluded when looking at the socio-occupational backgrounds of shareholders.[159] Turner also argued that wealthier individuals had a great incentive to act as the directors of banks in order to conduct a vetting role. In the period of unlimited liability, the vetting of shareholders allowed their directors to avoid a dilution of the aggregate shareholder wealth, which would have increased their own liability.[160]

The well-developed literature on British banks provides insights into the topic of shareholder liability. However, in the period of unlimited liability, quantifying the actual value of the joint and several liabilities would require an analysis of each individual shareholder. For the period after the 1870s, however, the amount of the limited liability can be measured for most of the banks, assuming the limited liability could be paid up

[155] Turner, *Banking in Crisis*, p. 126.
[156] Richard S. Grossman and Masami Imai, 'Contingent Capital and Bank Risk-Taking among British Banks before the First World War', *Economic History Review*, 66.1 (2013), 132–55. Both Esty and Grossman find similar results for the reduced risk-taking effect of double liability in the United States. See: Benjamin C. Esty, 'The Impact of Contingent Liability on Commercial Bank Risk Taking', *Journal of Financial Economics*, 1998, 189; Richard S. Grossman, 'Double Liability and Bank Risk Taking', *Journal of Money, Credit and Banking*, 33.2 (2001), 143.
[157] Acheson and Turner, *The Death Blow to Unlimited Liability*, p. 243.
[158] Turner, *Banking in Crisis*, p. 113.
[159] See Turner, *Banking in Crisis*, p. 117, Table 5.5. based on: Graeme G. Acheson and John D. Turner, 'The Impact of Limited Liability on Ownership and Control: Irish Banking, 1877–19141', *The Economic History Review*, 59.2 (2006), 320–46; Acheson and Turner, *The Death Blow to Unlimited Liability*; John D. Turner, 'Wider Share Ownership? Investors in English and Welsh Bank Shares in the Nineteenth Century', *The Economic History Review*, 62.S1 (2009), 167–92; Graeme G. Acheson and John D. Turner, 'Investor Behaviour in a Nascent Capital Market: Scottish Bank Shareholders in the Nineteenth Century', *The Economic History Review*, 64.1 (2011), 188.
[160] Turner, *Banking in Crisis*, pp. 111–13.

entirely by the shareholders in the case of a failure. Including this contingent capital, the total capital resources would consist of (1) the subscribed capital, divided into paid-up and unpaid (uncalled and reserve) capital, (2) the banks' reserves, (3) retained profits, and (4) hidden reserves.

Table 4 shows the capital/assets ratio and the hidden reserves of British joint-stock banks as discussed earlier in this section. In the second column, the unpaid capital as a percentage of the total assets is shown. The column to the right sums up the different components of the capital resources of the banks, showing the 'total capital strength' of the banks. Most major banks extinguished their unpaid capital between 1956 and 1958 in a capital reorganisation that was led by the Bank of England.[161] The small amounts of unpaid capital in later years results from the difference in the authorised share capital and the called up share capital (allotted and fully paid).[162]

Decade	C/A Ratio	Unpaid Capital / Total Assets	Hidden Reserves / Total Assets	Total Capital Strength Ratio
1881-1890	16.6%	36.0%	n.a.	52.6%
1891-1900	13.0%	28.5%	n.a.	41.5%
1901-1910	11.2%	23.4%	n.a.	34.6%
1911-1920	7.3%	15.8%	n.a.	23.1%
1921-1930	6.7%	8.8%	*2.2%	15.5%
1931-1940	5.9%	7.6%	*2.4%	+15.9%
1941-1950	3.0%	2.7%	*1.9%	+7.6%
1951-1960	2.7%	*2.1%	*2.8%	+7.6%
1961-1970	4.6%	*0.7%	*3.2%	+8.6%
1971-1980	*5.9%	*0.4%	0.0%	+6.3%
1981-1990	4.6%	*0.2%	0.0%	+4.8%
1991-2000	5.1%	n.a.	0.0%	5.1%
2001-2010	4.3%	n.a.	0.0%	4.3%

Table 4: Total Capital Resources in Percent of Total Assets, British Banks, Averages per Decade, 1881-2010[163]

[161] Turner, *Banking in Crisis*, pp. 131-32.

[162] See annual reports of the Big Four.

[163] Author's calculations. Data: Unpaid capital, 1951-1990: Individual balance sheets of Big Five / Big Four, collected by author; 1881-1950: 'The Economist Banking Supplement, Various, 1861-1946'. Hidden reserves: Billings and Capie, *Capital in British Banking*. Other data: Sheppard, *The Growth and Role of UK Financial Institutions*. Notes: * denotes the Big Five / Big Four banks. This data was used due to a lack of alternative data covering the whole market. + marks estimated figures, as these figures mix data from the whole market with aggregated data for the Big Five / Big Four banks. Please note that all forms of capital are measured against the same amount of total assets. This is a theoretical view with a constant standard of comparison. In practice, however, a higher capital in the balance sheet would increase the total assets. Therefore, the ratios below would be slightly lower than displayed. For a similar analysis

These calculations highlight that the extended limited liability was an integral part of the capital resources in the banking system. In the 1890s, for example, the unpaid capital amounted to 28.5% of the total assets. Compared to the deposits, 55% of the banks' deposits were covered by capital resources of various forms in the 1890s. The importance of unpaid capital decreased over time. In the 1930s, the unpaid capital as a percentage of the total assets was down to 2.7%.

3.5.2. Shareholder Liability in Switzerland

For Switzerland, there is no literature estimating the extent of the shareholder liability or disentangling the various regulations affecting it. This section will therefore briefly outline the laws relevant for the shareholder liability and then present estimates for the unpaid capital of shareholders.

Swiss corporate law was and still is part of the Swiss Code of Obligations.[164] It was first introduced in 1883. Besides regulating basic principles, such as accounting standards, disclosures and audits, it also dealt with the liability of shareholders. According to the Code of Obligations, only 20% of the capital of a joint-stock company had to be paid-up.[165] Consequently, there was no unlimited liability for the shareholders of joint-stock banks after 1883, but the size of the liability in the form of unpaid capital varied. This was different for cooperatives, which was the legal form of many savings banks at the time. If not stated otherwise in the articles of association of the bank, members of a cooperation were jointly liable with their personal wealth in the case of a bankruptcy.[166] This rule is still in force and therefore also applies to cooperative banks in the present day.[167]

The Code of Obligations from 1883 was the basis for all other laws and therefore also applied to banks. The only banks that were not subjected to the Code of Obligations were state-owned banks with state guarantees.[168] Besides the general regulatory

comparing the total capital resources to deposits, see also Turner, *Banking in Crisis*, p. 128, Figure 5.1.
[164] In German: 'Schweizerisches Obligationenrecht'
[165] Art. 618 & 633, *Bundesgesetz über das Obligationenrecht vom 14. Juni 1881*, 1883. This rule is still in place today, see Art. 632, *Bundesgesetz betreffend die Ergänzung des Schweizerischen Zivilgesetzbuches (Fünfter Teil: Obligationenrecht), (Stand am 1. April 2017)*.
[166] Art. 688 & 689, *Bundesgesetz über das Obligationenrecht vom 14. Juni 1881*.
[167] Art. 869 & 870, *Bundesgesetz betreffend die Ergänzung des Schweizerischen Zivilgesetzbuches (Fünfter Teil: Obligationenrecht), (Stand am 1. April 2017)*.
[168] Art. 613, *Bundesgesetz über das Obligationenrecht vom 14. Juni 1881*.

framework provided by the Code of Obligations, the Federal Banknote Act, also introduced in 1883, was the first law on a national level to regulate a particular banking activity.[169] The Act obliged note-issuing banks to hold a paid-up capital of at least CHF 500,000. If the paid-up capital was above CHF 500,000, note-issuing banks could – theoretically – still operate with unpaid capital. The paid-up capital of CHF 500,000, however, would have to represent 20% of the total capital (according to the Code of Obligations).

When Switzerland's first national Banking Act was introduced in 1934, it allowed the use of unpaid capital for regulatory purposes, therefore building on the corporate law anchored in the Code of Obligations. The Banking Act stipulated a so-called required capital, the statutory minimum threshold of capital. Both joint-stock banks and cooperative banks could use up to 50% of their unpaid capital as being counted as their required capital from a legal point of view (see also Section 6.2.1 for a detailed discussion of the Swiss capital regulation). The regulatory practice of allowing unpaid capital to be part of the required capital was maintained until 2012.[170]

Based on the regulatory framework, extensive use of unpaid capital and unlimited liability was possible. Table 5 and Table 6 provide insights into the capital and liability structure of Swiss banks. The data availability for the 19th century is low. The numbers shown in Table 5 up to 1906 are taken from Adolf Jöhr's compilation and cover only note-issuing banks.[171] Small banks are underrepresented in this period (see also Section 3.2). Therefore, Table 6 shows an additional sample of Swiss savings banks, collected by Johann Ludwig Spyri and later by the Statistical Bureau of the Federal Department of the Interior. Using both sources allows for a more balanced view on capital ratios, as note-issuing banks tended to be larger banks, and savings banks tended to be smaller

[169] *Bundesgesetz über die Ausgabe und die Einlösung von Banknoten vom 8. März 1881*.
[170] Eidgenössische Finanzmarktaufsicht FINMA, Jahresbericht 2009 (2010), p. 45.
The most prominent bank using unpaid capital for regulatory purposes was the Raiffeisen group. Between the 1970s and 1990s, on average more than 60% of the bank's required capital consisted of unpaid capital. The Raiffeisen banks could simply change the amount of their members' liability in the articles of association, and by that substantially increase their regulatory capital. See: Simon Amrein, 'Eigenmittel der Schweizer Banken im historischen Kontext', in *Krisenfeste Schweizer Banken? Die Regulierung von Eigenmitteln, Liquidität und «Too big to fail»*, ed. by Armin Jans, Christoph Lengwiler, and Marco Passardi (Zürich: NZZ Libro, 2018), pp. 87–116 (p. 108).
[171] Jöhr, *Die Schweizerischen Notenbanken*. Adolf Jöhr was General Secretary of the Swiss National Bank 1907-1915, Member of the Board of Governors of the Swiss National Bank 1915-1918, General Manager of Credit Suisse 1918-1939, and Member of the Bank Council of the Swiss National Bank 1939-1951. See: Katja Hürlimann, 'Jöhr, Adolf', *Historisches Lexikon der Schweiz - Dictionnaire historique de la Suisse - Dizionario storico della Svizzera* (Bern) <http://www.hls-dhs-dss.ch/textes/d/D46271.php> [accessed 30 April 2019].

banks (measured by total assets). After 1906, the data in Table 5 become increasingly representative of the banking market, as the Swiss National Bank started to collect and aggregate data. In the first decade of the SNB banking statistics, however, the National Bank also struggled to obtain a complete set of data. The reasons for this can be found in the lack of publication requirements. According to the Code of Obligations, banks were not obliged to produce a public annual statement. Moreover, providing data to the SNB was not mandatory. Many of the smaller savings banks often did not publish a balance sheet or income statement for the public.[172] Publication requirements in banking were only introduced with the Banking Act in 1934.

Table 5 presents estimates of capital/assets ratios as averages per decade from 1840 to 2010. The ratios are adjusted both by the estimates on hidden reserves presented in Section 3.4.2 as well as unpaid capital. Both figures are measured as a percentage of the total assets. Including hidden reserves and unpaid capital leads to a minimum estimate for the 'total capital strength' of the Swiss banks. It shows that a substantial part of the equity capital of note-issuing banks in the 19th century was unpaid capital, reaching its highest point at 6.9% in the 1860s. The numbers were substantially lower during the 20th century for the whole banking market. In the 1970s, for example, unpaid capital added on average 0.4 percentage points to the capital/assets ratio of 6.3%. Including hidden reserves, this would lead to an adjusted capital/assets ratio of 7.6%, which was 20% higher than the published capital/assets ratio.

Analysis of the alternative statistics for the 19th century produced by Spyri and the Statistical Bureau of the Federal Department of the Interior in Table 6 shows that the capital ratios presented above (in Table 5, based on data from Jöhr and the SNB) are probably too high. Even though the data compilation by Spyri in Table 6 was termed 'savings banks statistics', it has to be noted that it covered all banks that were accepting savings from customers. This included also Cantonal banks, all kinds of savings banks (school savings banks, industrial/company savings banks), and credit banks ('Darlehenskassen', 'Bodenkreditbanken').[173] The most important banking group missing in Table 6, however, are the Big Banks.[174] These banks, however, were mostly established only in the last third of the 19th century.

[172] Swiss National Bank, *Das Schweizerische Bankwesen 1909-1913*, p. 5.
[173] Ritzmann, *Die Schweizer Banken*, p. 254.
[174] The only exception being the Volksbank, which was established as a savings bank.

Decade	Capital/Assets Ratio	Unpaid Capital / Total Assets (Estimate)	Hidden Reserves / Total Assets (Minimum Estimate)	Total Capital Strength Ratio (Minimum Estimate)
+1841-1850	44.0%	0.8%	n.a.	44.8%
+1851-1860	34.5%	4.0%	n.a.	38.5%
+1861-1870	32.1%	6.9%	n.a.	39.0%
+1871-1880	20.9%	2.5%	n.a.	23.3%
+1881-1890	17.0%	1.8%	n.a.	18.7%
+1891-1900	15.3%	0.9%	n.a.	16.2%
+1901-1910	13.2%	0.4%	n.a.	13.7%
1911-1920	13.5%	0.4%	n.a.	13.8%
1921-1930	12.5%	0.1%	n.a.	12.6%
1931-1940	12.3%	n.a.	n.a.	n.a.
1941-1950	10.3%	n.a.	n.a.	n.a.
1951-1960	7.6%	n.a.	n.a.	n.a.
1961-1970	6.3%	0.1%	0.4%	6.7%
1971-1980	6.3%	0.4%	1.0%	7.6%
1981-1990	6.2%	0.4%	0.9%	7.5%
1991-2000	5.9%	*0.4%	*0.6%	6.8%
2001-2010	5.6%	n.a.	n.a.	n.a.

Table 5: Total Capital Resources in Percent of Total Assets, Swiss Banks, Averages per Decade, 1841-2010[175]

Why is there such a deviation in capital ratios for the 19th century between the two statistical sources of Jöhr (Table 5) and Spyri/Bureau of the Federal Department of the Interior (Table 6)? Many of the savings banks founded in the first half of the 19th century were established as savings clubs or cooperatives. The guarantee for the liabilities of these banks was rooted in their non-profit orientation and the mutual trust of the members founding the cooperative. There was often only a very small or even no capital at the beginning, and reserves were only built up over time.[176] Operating under limited or even unlimited liability was likely to be a very crucial element, as it allowed to establish banks with a low or no capital at all. Raising large amounts of capital in rural, agriculturally dominated environments would have been difficult. Moreover, many banks had municipal or Cantonal guarantees for their liabilities. By 1862, 36 out of 235 banks had a Cantonal or municipal guarantee and 55 banks had a guarantee provided by private

[175] Data: 1841-1900: Adolf Jöhr, *Die Schweizerischen Notenbanken*; Capital/Assets Ratios 1901-2010: Swiss National Bank, *Die Banken in der Schweiz (annual issues 1906-2015)*. Various Issues 1906-2010. Notes: The period from 1841-1900 covers note-issuing banks only. * The data is available from 1991-1994 only. + Note-issuing banks only, no other data available.
[176] Johannes Ludwig Spyri, *Die Ersparnisskassen der Schweiz (1852-1862)*, Schweizerische Statistik (Zürich: Druck von Gebrüder Gull, 1864).

individuals.[177] By 1908, the number of banks operating with governmental guarantees had grown to 61 banks.[178] These high numbers indicate the relevance of guarantees in the Swiss banking system that, to some extent, were able to replace paid-up capital.

The capital/deposits ratios shown in Table 6 increased substantially towards the end of the 19th century. In 1862, the capital/deposits ratio was only 7.5%. In 1882, the ratio had reached 28.5%. It is likely that the number of joint-stock banks in the sample increased substantially during that period and that joint-stock banks were better capitalised in terms of paid-up capital than banks with other legal structures. A more detailed analysis with individual bank-level data would be required to provide further insights into the effects of the legal form of a bank – and with that the form of the liability – on capital ratios. But the structure of the samples for the 19th century in Table 5 and Table 6 certainly indicate that extended forms of liabilities were an relevant determinant for capital ratios in Switzerland.

	1852	**1862**	**1872**	**1882**	**1908**
Capital/Deposits Ratio	4,5%	7,5%	n.a.	28,5%	35,3%
Capital/Assets Ratio	n.a.	n.a.	n.a.	12,8%	12,1%
No. of banks	163	235	303	487	385
No. of banks with Cantonal guarantee	n.a.	11	12	15	22
No. of banks with municipal guarantee	n.a.	25	23	36	39
No. of joint-stock banks w/o municipal/Cantonal guarantees	n.a.	n.a.	87	141	180

Table 6: Swiss Savings Banks Statistics, 1852, 1862, 1972, 1882 and 1908[179]

[177] Spyri, *Die Ersparnisskassen der Schweiz (1852-1862)*.
[178] Statistisches Bureau des eidgenössischen Departements des Innerns, *Statistik der schweizerischen Sparkassen für 1881 und 1882, mit einem Nachtrage für 1886* (Bern: Orell Füssli & Co., 1889).
[179] Data: Spyri, *Die Ersparnisskassen der Schweiz (1852-1862)*; Statistisches Bureau des eidgenössischen Departements des Innerns, *Statistik der schweizerischen Sparkassen für 1881 und 1882, mit einem Nachtrage für 1886*; Statistisches Bureau des eidgenössischen Departements des Innerns, *Statistik der schweizerischen Sparkassen 1908* (Bern: A. Francke, 1912). Another source for banking statistics would be the compilation by Ritzmann, who based his statistical overview partly on the 'Sparkassenstatistiken', but did not provide additional information on the capital or liability situation of the banks. See: Ritzmann, *Die Schweizer Banken*.

This chapter has provided a detailed overview of the evolution of capital/assets ratios. It has shown that these ratios have to be assessed carefully, especially when comparing the ratios of different countries and over longer time periods. Existing datasets – despite being frequently used – often suffer from various drawbacks and deficiencies. Navigating these pitfalls, this chapter has shown that capital ratios in both Switzerland and the United Kingdom are actually considerably higher when hidden reserves are taken into account. The high volume of hidden reserves in the two banking systems also questions the validity of banks' public figures, especially when it comes to profits. In addition, the liability of shareholders is likely to influence the capital structure of banks. In this context, it has to be noted that the data on the Swiss banking market in the 19th century is fragmented and has various gaps. The role of shareholder liabilities is well-researched for British banks, but prima facie evidence in the Swiss context emphasises that it mattered in Switzerland too. A further interesting avenue for research would be the role played by widespread governmental guarantees in the Swiss system and the effect these had on the banks' risk-taking.

After having reviewed capital ratios in a more descriptive fashion, the next chapters will turn to long-run changes which altered the understanding of capital ratios and capital adequacy of contemporaries. Many of the topics touched upon briefly in previous chapters – such as the role of regulation, the effects of war finance, or the path towards an international framework for bank capital – will be discussed in further detail in the following chapters.

4. How Ideas Shape Capital Structures

Establishing a joint-stock company requires capital. Moreover, every founder has to determine the amount of capital that is considered 'adequate' to start running a business. What does 'adequate' mean in numbers? From the late 1820s onwards, founders of joint-stock banks in England faced precisely that question.[180] Several decades later, as the 1850s drew to a close, their Swiss counterparts had to make similar decisions about what the initial capital for their own emerging joint-stock banks would be.

In present days, the capital level of banks is strongly influenced by regulation. Statutory capital regulation specifies a required minimum capital for establishing a bank, and it sets minimum capital requirements for running a bank. According to the last Bank Regulation and Supervision Survey carried out by the World Bank, only six out of 142 countries did not stipulate a minimum capital requirement.[181] When joint-stock banks were first established in the 19th century, however, no such rules existed. Banking in England and Switzerland was only lightly regulated at best, with the regulation of capital non-existent for most of the time. What did the founders of new banks rely on when determining how much capital was adequate? Were there informal conventions among the banks that guided their capital policies?

This chapter emphasises how important ideas about capital adequacy were in the first age of joint-stock banking by analysing banking literature and banking practice from the 19th century onwards. Such ideas – in the following termed 'capital ideas' – were expressed in banking textbooks and magazines. They were a product of the knowledge accumulated over time on how to manage the balance sheet of a bank, the risks involved in banking, and how capital levels relate to risk. The chapter aims to trace the evolution of this knowledge. Naturally, there were a variety of ideas around how much capital was considered as 'adequate'; bank managers, for instance, might have disagreed with depositors or shareholders. These conflicting interests, however, formed the very starting point for the development of capital policies, as the next sections will go on to show.[182]

[180] The focus in this chapter is only on one of the constituent countries of the United Kingdom, which is England. This choice was made due to the differences in the banking markets of the 19th century in the constituent countries. For a discussion of the use of the United Kingdom or England for the analysis of this thesis, see Section 1.2.
[181] World Bank, *Bank Regulation and Supervision Survey*, September 2012.
[182] The term 'capital ideas' is borrowed from Peter Bernstein's book on the history of modern finance theory. Bernstein shows how finance theory transformed into a quantitative discipline from the 1960s onwards. Peter L. Bernstein, *Capital Ideas: The Improbable Origins of Modern Wall Street* (New York: John Wiley & Sons, 2005).

The chapter argues that capital ideas became more nuanced as banking became more professionalised. Over time, banks abandoned many of the universal rules of thumb guiding their capital policies in favour of more differentiated views that considered the risks of individual banks. Nevertheless, there were informal conventions that banks continued to follow with regards to capital thresholds. Overall, though, these conventions in the form of target capital ratios decreased over time and with that, capital ratios fell.

Section 4.1 of this chapter discusses banking literature written in the English or German language. Within the literature written in English, the focus is mostly on British banking literature, because there were various links between the banks and the literature. The British literature was often written by banking practitioners, who intended to create and share their knowledge on how to run banks. In modern terms, this literature could be categorised in the discipline of 'business administration'.[183] However, where relevant, the section also refers to US-American banking literature, as the British banking literature cannot simply be viewed as an independent stream of literature.[184]

Another reason for the emphasis on British banking literature is that Section 4.2 sheds light on contemporary banking practice, and joint-stock banks from England (besides Switzerland) serve as prime examples for the discussion of capital adequacy in the early era of joint-stock banking. The emphasis will be on how banks communicated and justified their capital increases. Section 4.2 is split into two, using English and Swiss joint-stock banks as case studies. Moreover, this section will also present the capital ratios of individual joint-stock banks in the two countries, as the data availability of aggregated national datasets is low for most of the 19th century.

The analysis of individual banks and their capital ideas made here does not claim to be representative of the whole banking market. Nevertheless, the focus on large and important joint-stock banks provides insights into a relevant market share. On a broader level, perceptions of capital adequacy serve as a point of reference for further discussions in Chapters 5 and 6.

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[183] Since the focus is on capital and joint-stock banks from the 19th century, earlier publications elaborating on, for example, the real bills doctrine (also referred to as the commercial loan theory of credit) by John Law, Adam Smith, or Henry Thornton are not included. (John Law, *Money and Trade Considered* (Edinburgh, 1705); Adam Smith, *An Inquiry into the Nature and Causes of the Wealth of Nations* (London, 1776); Henry Thornton, *An Enquiry into the Nature and Effects of the Paper Credit of Great Britain* (London, 1802).) For an overview of that literature, see: Lloyd Wynn Mints, *A History of Banking Theory in Great Britain and the United States* (Chicago: University of Chicago Press, 1945).

[184] For links between early US-American and British banking literature, see Mints, *A History of Banking Theory in Great Britain and the United States*, pp. 61–73, 125ff.

4.1. 19th Century Banking Literature

Along with the growing importance of joint-stock banks in England from the late 1820s onwards came increased professionalism in banking and new literature by contemporaries on the practice of banking. This evolution was marked by the establishment of the Institute of Bankers in 1879 in England and various publications on the topic of banking. The Institute's *Journal of the Institute of Bankers* served as a standard source of information for bankers, covering various theoretical issues as well as answering practical questions. These questions were also regularly published as *Questions on Banking Practice* from 1885 onwards. Both publications complemented an existing one, *The Bankers' Magazine*, founded in 1843, which had quickly become the most relevant publication for bankers.

Besides the two magazines, banking practitioners or people who were to some extent involved in banking in the United Kingdom started to publish books. Among them were Thomas Joplin, James William Gilbart, Walter Bagehot, George Rae, and later Walter Leaf. Thomas Joplin, one of the early banking theorists, took part in the foundation of various banks, among them the Provincial Bank of Ireland in 1825, the National Provincial Bank of England in 1833, and the London and County Banking Co. in 1839.[185] James William Gilbart was the General Manager of the Westminster Bank from 1833 to 1860.[186] Walter Bagehot was the Secretary of Stuckey's Banking Company and later editor of *The Economist*.[187] George Rae worked as General Manager and later Chairman (1873-1898) of the North and South Wales Bank in Liverpool.[188] Walter Leaf was Chairman of the Westminster Bank from 1918 to 1927 and President of the Institute of Bankers.[189]

Many of their works became 'classics' in British banking literature. Joplin published his *Essay on the General Principles and Present Practices of Banking in England and Scotland* in 1822, which was a pamphlet against the note issuance monopoly of the Bank

[185] Oxford Dictionary of National Biography, 'Joplin, Thomas (c. 1790–1847), Banker and Author' <http://www.oxforddnb.com> [accessed 3 January 2018].
[186] Oxford Dictionary of National Biography, 'Gilbart, James William (1794–1863), Banker and Author' <http://www.oxforddnb.com> [accessed 3 January 2018].
[187] Oxford Dictionary of National Biography, 'Bagehot, Walter (1826–1877), Political Commentator, Economist, and Journalist' <http://www.oxforddnb.com> [accessed 3 January 2018].
[188] Oxford Dictionary of National Biography, 'Rae, George (1817–1902), Banker' <http://www.oxforddnb.com> [accessed 3 January 2018].
[189] Oxford Dictionary of National Biography, 'Leaf, Walter (1852–1927), Banker and Classical Scholar' <http://www.oxforddnb.com> [accessed 3 January 2018].

of England but also an analysis of the banking system from a theoretical point of view.[190] Gilbart authored the two standard textbooks of the time, *A Practical Treatise on Banking* (1827) and *The History and Principles of Banking* (1834).[191] Bagehot's famous *Lombard Street: A Description of the Money Market* (1873) also featured a chapter on joint-stock banking.[192] Rae, meanwhile, published *The Country Banker* in 1885.[193] Leaf authored the classic textbook *Banking* in 1927, and it was re-published in several editions up to 1943.[194]

The knowledge produced in the British publications was not independent from the rest of the literature written in English, but usually had a strong focus on British issues at the time. However, the more general guidelines with regards to capital seemed to be quite similar (see Section 4.1.1). A good example is Charles F. Dunbar's *Theory and History of Banking* published in 1891.[195] Dunbar was a professor at Harvard University. He wrote a textbook on banking to use it in class when teaching political economy. Furthermore, there were also links between British and US-American banking literature because authors wrote about the different banking systems. Gilbart even authored a book on the *History of Banking in America* in 1837, highlighting the superiority of unlimited liability in the British system.[196] Henry Charles Carey, an American publisher, economist and sociologist, criticised exactly the limited liability of the British banking system in 1860.[197] And Albert Gallatin, who was Secretary of the US Treasury from 1801 to 1814, also wrote

[190] Joplin, *Essay on Principles of Banking*.
[191] James William Gilbart, *A Practical Treatise on Banking*, 1827. James William Gilbart, *The History and Principles of Banking* (London: Longman, Rees, Orme, Brown, Green, and Longman, 1834).
[192] Walter Bagehot, *Lombard Street: A Description of the Money Market* (London: Henry S. King & Co., 1873).
[193] George Rae, *The Country Banker, His Clients, Cares, and Work. From an Experience of Forty Years* (London: John Murray, 1885).
[194] Walter Leaf, *Banking* (London: Williams & Norgate Ltd., 1927). For a good overview of the British banking literature, see: Forrest Capie and Geoffrey Edward Wood, *Banking Theory, 1870-1930*, History of Banking and Finance (New York ; London: Routledge, 1999).
[195] Charles F. Dunbar, *Theory and History of Banking* (New York: G.P. Putnam's Sons, 1891).
[196] 'Unlimited liability gives greater security to the public. […] It is not necessary to prove that the paid-up capital and the remaining property of the partners form a larger fund than the paid-up capital. The unlimited liability of the partners constitutes therefore a higher guarantee for the ultimate payment of the debts of the bank, whether those debts arise from notes or deposits.' James William Gilbart, *The History of Banking in America* (London: Longman, Rees, Orme, Brown, Green, and Longman, 1837), p. 78.
[197] About the London joint-stock banks, Carey wrote: 'We have here all the elements of instability – large loans – large liabilities – small capital – and great dividends.' Henry Charles Carey, *Principles of Social Science, Volume 2* (Philadelphia: J.B. Lippincott & Co., 1860), p. 405.

about British banking in his book *Considerations on the Currency and Banking* in 1831.[198] Thus, the writers were aware of each other's publications.

Even though bank capital was frequently discussed in British banking literature, it was not a central issue. The early debates about banking stability arose over the topic of liquidity. Recommendations on liquidity were usually much more specific than recommendations on solvency ratios. The crises of 1847, 1857, and 1866 fostered the view that liquidity was vital in avoiding financial crises.[199] Rae, for example, argued that the 'financial reserve' should be one-third of the liabilities to the public in order 'to guard against all probable demands'.[200] Similarly, Bagehot highlighted the crucial role of reserves and that the 'greatest strain on the banking reserve is a "panic"'.[201] Reserves in the context of liquidity usually meant liquid assets such as cash, money at call and short notice, Consols, and reserves at the Bank of England.

At first glance, the publications to the British banking literature represent theoretical contributions to banking literature: theoretical in the sense that they contemplated and rationalised banking as a discipline. At the same time, however, the publications were usually strongly practice-oriented. Many writers elaborated on the management of banks, which was not surprising, given that many authors were practitioners themselves.

Banking literature from the German-speaking countries lagged slightly behind in time. One of the earliest classic publications on the practice of banking in German was Otto Hübner's *Die Banken* (1854), which described the different activities of banks. It also discussed other banking systems and published balance sheets of banks from various countries. Hübner did not propose specific minimum capital ratios but stated that capital 'must always be kept available as the basis of the banker's credit in order to maintain it and to make good the losses which may result from the purchase and sale of credit.'[202]

More importantly, Hübner's book was the first to formulate what came to be known as the 'Goldene Bankregel' in the German-speaking space. This 'golden bank rule'

[198] Albert Gallatin, *Considerations on the Currency and Banking* (Philadelphia: Carey and Lea, 1831). Gallatin, born Abraham Alphonse Albert de Gallatin in Geneva, was also a Senator (1793–1794) and member of the House of Representatives (1795-1801). Federal Reserve Bank of Richmond, 'Albert Gallatin - Federal Reserve History' <https://www.federalreservehistory.org/people/albert_gallatin> [accessed 13 January 2019].
[199] Capie and Wood, *Banking Theory, 1870-1930*, p. 8.
[200] Rae, *The Country Banker*, p. 206.
[201] Bagehot, *Lombard Street*, p. 129.
[202] Otto Hübner, *Die Banken* (Leipzig: Verlag von Heinrich Hübner, 1854), p. 29.

concerned the liquidity of banks and stated that the duration of assets and liabilities should match. In the words of Hübner:

> The credit which a bank can give, without running the risk of being unable to meet its obligations, must correspond not only in amount but also in quality to the credit which it enjoys. […] One cannot give the long-term credit if one has received only the short-term one without running the great risk of not being able to give the latter back.[203]

Only three years after Hübner's *Die Banken*, Adolph Wagner published a critique of the 'golden bank rule', introducing a second famous banking principle, the 'Bodensatztheorie'. Wagner stated that normally, not all depositors withdraw their capital at the same time. Thus, a certain amount of deposits can be used for long-term loans.[204] Both theories are still cited frequently in contemporary German literature as basic concepts for asset and liability management.[205] It was also Wagner who in 1873 provided one of the first thorough discussions of capital adequacy in the German literature.[206]

Both Hübner and Wagner were economists from Germany. In contrast to the English banking literature, German banking literature was dominated by academics rather than practitioners. Other examples are publications by Max Wirth (*Handbuch des Bankwesens*, 1870), Adolf Weber (*Depositenbanken und Spekulationsbanken*, 1902; *Geld, Banken, Börse*, 1939), or Georg Obst (*Banken und Bankpolitik*, 1909).[207]

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[203] Hübner, *Die Banken*, p. 28.
[204] Adolph Wagner, *Beiträge zur Lehre von den Banken* (Leipzig: Voss, 1857), p. 167.
[205] In 1879, Karl Knies extended the 'Bodensatztheorie' with the 'Realisationstheorie'. Knies argued that short-term liquidity problems can be ameliorated by the German Reichsbank if needed. Karl Knies, *Geld und Credit* (Berlin: Weidmann, 1879). Jan Körnert points out that the German discussions on liquidity developed similarly to that in the United States, where the Orthodox Theory/Commercial Loan Theory and the Shiftability Theory were discussed. Jan Körnert, 'Liquiditäts- oder Solvabilitätsnormen für Banken? Zu den Anfängen eines Paradigmenwechsels und zur Einführung von Solvabilitätsnormen zwischen 1850 und 1934', *VSWG: Vierteljahrschrift für Sozial- und Wirtschaftsgeschichte*, 99.2 (2012), 171–88.
[206] Adolph Wagner, *System der Zettelbankpolitik: mit besonderer Rücksicht auf das geltende Recht und auf deutsche Verhältnisse - ein Handbuch des Zettelbankwesens* (Freiburg i. Br.: F. Wagner, 1873).
[207] Max Wirth, *Grundzüge der National-Ökonomie: Handbuch des Bankwesens* (Köln: DuMont-Schauberg, 1870). Adolf Weber, 'Depositenbanken und Spekulationsbanken: ein Vergleich deutschen und englischen Bankwesens' (Rheinische Friedrich-Wilhelms-Universität, 1902). Georg Obst, *Banken und Bankpolitik* (Leipzig: Verlag von Carl Ernst Poeschel, 1909). Adolf Weber, *Geld, Banken, Börsen* (Leipzig: Quelle & Meyer, 1939). A general work of reference was also *Die Deutsche Bankwirtschaft*, an encompassing compendium of five volumes published between 1935 and 1938 that covered everything from bank products, accounting principles, to capital markets, and organisational questions. Walzer Kunze, Hans Schippel, and Otto Schoele, *Die deutsche Bankwirtschaft: Ein Schulungs- und Nachschlagewerk für das deutsche Geld- und Kreditwesen* (Berlin: Verlag der Betriebswirt, 1935).

Discussions about the management of banks and capital adequacy were often missing in these publications. Most comparable to the publications of British banking practitioners is Felix Somary's *Bankpolitik* from 1915.[208] Somary was an Austrian-Swiss banker, economist and political analyst.[209] *Bankpolitik* provided a practical overview of how banks, money and capital markets worked.

The banking literature in the German language did not evolve as an independent stream of knowledge but built on the already existing British banking literature. Among the German books cited above, for example, not a single book missed referring to Gilbart's classics when elaborating on capital. The publication of German magazines covering banking practice and theory evolved only about half a century after the British equivalents. The *Bank-Archiv*, for example, was published from 1901, *Die Bank* and *Zahlungsverkehr und Bankbetrieb* from 1908, and the *Bankwissenschaft* from 1927. In Switzerland, there were no banking magazines comparable to those from Germany or England. Annual publications on the evolution of Switzerland's banking and financial market such as the *Schweizerische Finanzjahrbuch*, published from 1899 to 1960, consisted mainly of statistical overviews.

Having outlined the central contributions to banking literature, the next section will move on to deal with the views present in the literature on capital adequacy.

4.1.1. How Much Capital is Adequate?

British banking literature used a variety of terms for what is nowadays referred to as equity capital. Gilbart, for example, distinguished between invested capital and banking capital.[210] The former refers to the capital provided by shareholders (equity capital), the latter to capital raised by the bank through deposits, the issuance of notes, and the drawing of bills (debt capital). Moreover, the term reserves can be easily misunderstood, especially as early debates in the British banking literature centred on the topic of liquidity. In this context, the term 'reserves' was also used for liquid assets and reserves at the Bank of England. If not specified otherwise, the use of reserve in the following section refers to reserves as part of the equity capital.

[208] Felix Somary, *Bankpolitik* (Tübingen: J. C. B. Mohr, 1915).
[209] See Tobias Straumann's introduction in: Felix Somary, *Erinnerungen aus meinem Leben*, NZZ Libro (Zürich: Verlag Neue Zürcher Zeitung, 2013), pp. 9–22.
[210] Gilbart, *The Principles and Practice of Banking*.

As mentioned above, 19th-century banking literature did put forward some ideas on the relevance of bank capital, despite it not being a central topic. Bagehot, for example, stressed the role of capital as a source of public trust in a bank and a guarantee for the bank for its operations.[211] However, he emphasised that 'a banker's business – his proper business – does not begin while he is using his own money: it commences when he begins to use the capital of others.'[212] In a similar fashion to Bagehot, Gilbart described the profession of a banker as 'a dealer in capital'.[213]

According to Bagehot and Gilbart, working with capital was at the heart of banking. By capital, they referred to all sorts of capital, be it from depositors, shareholders or other sources. Many authors also raised the question of capital adequacy, though remained vague when it came to specific quantitative recommendations. Joplin, for example, referred to a 'sufficient' capital. He did not suggest a specific figure but made 'sufficient' dependent on the efficient use of resources.[214]

Joplin seems to have had a reasonably well-founded idea of how much capital was adequate. In the context of Scottish banking, he noted that the capital of both the Bank of Scotland and the Royal Bank of Scotland were 'unnecessarily large'. Compared to the trade in Edinburgh and considering the stability of the banks, Joplin argued that they would be equally sound if they reduced their capital by 50%, with beneficial effects for the profit per stock.[215] With this argument, Joplin had already considered various factors determining the capital of a bank in 1822: he considered the risks involved in the business, referred to the interests of shareholders in a low capital level, and implied that capital resources should be allocated efficiently. For its time (1822), shedding light on capital efficiency both from a bank's and a shareholder's perspective and referring to a potential trade-off was already quite advanced.

[211] Bagehot, *Lombard Street*, p. 113.
[212] Bagehot, *Lombard Street*, p. 113.
[213] Gilbart, *A Practical Treatise on Banking*, pp. 1–2.
[214] Joplin, *Essay on Principles of Banking*, p. 30. 'All that a Bank can gain by capital is credit. And when its capital is sufficiently large to put that upon the most solid basis, it is as large as there is any occasion for; more than that only incumbers it, and would be as well in the hands of the original Stock-holder, many of whom would probably turn it to better account.'
[215] Joplin, *Essay on Principles of Banking*, p. 30. Related to that, Bagehot also observed that Scottish banks paid comparatively lower dividends than English banks. Bagehot, *Lombard Street*, p. 121.

The most well-known suggestion on the size of an adequate equity capital came from Gilbart in 1827 in *A Practical Treatise on Banking*:

> Although the proportion which the capital of a bank should bear to its liabilities may vary with different banks, perhaps we should not go far astray in saying it should never be less than one-third of its liabilities.[216]

Gilbart added that he would exclude everything but notes and deposits from the liabilities. Only if the ratio of paid-up capital to notes and deposits fell below one third would he advise banks to increase their capital. Similarly to Joplin, Gilbart also looked to the Scottish banking market for guidance, most probably deriving the 'one-third-requirement' from Scottish banks.[217] At the time – the late 1820s – joint-stock banks had just started to emerge in England, while Scotland already had a much more established joint-stock banking market.

The idea that the proportion of capital to deposits was crucial – rather than that to the total of assets – found its way into later discourses. If such proportions were discussed, they were based on comparisons with total deposits. In 1877, *The Bankers' Magazine* undertook the first attempt to measure the size of banks' capital in the United Kingdom.[218] In an article titled 'The Capital employed in Banking in the United Kingdom', the magazine presented statistics on the size of capital and reserves for joint-stock banks in England, Scotland, Ireland and the Isle of Man.

The interpretation of the data was limited. *The Banker's Magazine* noted that a comparison of capital with deposits would have been desirable, but data on deposits was not available for the United Kingdom.[219] Thus, *The Banker's Magazine* was not able to publish capital ratios. Instead, the magazine presented a comparison between total amount of capital in the United Kingdom and the United States. As of 1876, the capital of British joint-stock banks was estimated at £87.5m, divided into paid-up capital of £64.3m and reserves of £23.2m.[220] The capital of US banks reached £143.8m.[221] *The Bankers' Magazine* considered the figures for the United Kingdom's banks comparatively

[216] Gilbart, *A Practical Treatise on Banking*, p. 309.
[217] Gilbart, *A Practical Treatise on Banking*, p. 312.
[218] The Bankers' Magazine, 1877, 361–69.
[219] The Bankers' Magazine, 1877, p. 362.
[220] This includes the Bank of England, joint-stock banks from England, Scotland, and the Isle of Man. The total capital of joint-stock banks from England (excl. BoE) was £46.8m.
[221] This includes national banks, state banks, savings banks, and private banks. The original sources for the number cited in *The Bankers' Magazine* was the report of the Currency of the Comptroller.

high since they did not include numbers from private and savings banks.[222] The magazine stressed the importance of capital for public confidence and viewed the amount of capital as a meaningful figure for the progress of British banks. *The Bankers' Magazine* also indicated that domestic banks usually chose stability in the form of high capital over high dividend payments. With regards to the appropriate level of capital in banking, *The Bankers' Magazine* referred to Gilbart's 'one-third requirement' and confirmed the validity of his views.[223]

Thereafter, *The Banker's Magazine* published annual reviews of bank capital in the United Kingdom. From 1902, the magazine also began comparing capital and reserves to deposits and liabilities. The magazine wrote that 'the proportion of capital to the deposits is a matter of considerable importance.'[224] With regards to the optimal capital/liability ratio, however, *The Banker's Magazine* gradually changed its position. In 1903, the magazine stated that no specific ratio should be followed:

> Experience appears to point out to some banks that it is advisable for them to hold a larger amount of capital in proportion to their liabilities than other banks do. This might naturally be expected, from the different circumstances of the various businesses. Some banks may require in certain stages of their career to possess much larger sums as capital than others may do. They may be called on to make considerable advances, and may feel it necessary to hold a considerable capital while they are collecting the deposits which eventually gather round their business and help them.[225]

The move towards a more differentiated view on the adequate size of bank capital, however, seemed to have happened even earlier. Rae referred to the ratio of capital to liability as a measure for the 'ultimate stability' of a bank in 1885. In contrast to Gilbart's view on capital adequacy about 60 years earlier, Rae considered the assets of banks as a determining factor for adequate capital. The author emphasised that 'there is no accepted rule in the matter, and it would be difficult to frame one', making the size of adequate capital dependent on the soundness of the assets.[226] Similar, nuanced views can also be found in the US American banking literature. In 1891, Dunbar highlighted that there was not one single minimum capital ratio applicable to all banks. He stated

[222] The Bankers' Magazine, 1877, pp. 363–64.
[223] The Bankers' Magazine, 1877, p. 365.
[224] The Bankers' Magazine, 1903, p. 826.
[225] The Bankers' Magazine, 1903, p. 828.
[226] Rae, *The Country Banker*, p. 260.

that the safety of banks depended on the amount of capital. A sufficient amount of capital, in turn, would depend on 'the kind of business'.[227] These ideas would more clearly materialise in the second half of the 20th century, as national regulators started to introduce concepts based on the risk of assets (see Chapter 6).

The German banking literature also offers evidence of an increasingly nuanced view on capital adequacy. Wagner wrote extensively about the role of capital in banking in 1873, viewing it as a form of guarantee for depositors. This guarantee would not necessarily have to take the form of paid-up capital. It could also be an unlimited or limited liability. When making this point, Wagner referred to the British joint-stock banks as an example, noting that 'a highly magnificent banking operation does not necessarily require a substantial amount of own capital.'[228]

Moreover, the author noted that many German savings banks often commenced business without any capital at all. Instead, the capital was replaced by municipal guarantees. The use of guarantees was also widespread in Switzerland, as shown in Section 3.5.2. According to Wagner, the primary role of capital, and also its guarantee, was to generate trust for depositors and to cover losses. Without providing a specific minimum capital ratio, Wagner concluded that an adequate capital would have to be a compromise between the amount, risk, and coverage of assets.[229] Wagner also noted that younger banks tended to have higher capitals compared to liabilities, whereas older banks tended to have a lower ratio.[230] Almost at the same time, Bagehot made the same observation in the context of English joint-stock banking.[231]

In line with Rae and Wagner, Somary emphasised the importance of the duration and liquidity of assets as determinants of capital ratios. Moreover, he argued that the amount of capital should be dependent on the duration of liabilities. In the case of a bank with a large amount of short-term liabilities, more capital is required because short-term liabilities could be withdrawn more quickly than liabilities with longer maturities. Somary

[227] 'We can only say that other things being equal, the larger the business that can be carried on with safety with a given capital, the larger will be the field from which profits can be earned, and the higher the proportion which the profits will bear to the original investment; but the point at which the extension of the business passes the line of safety, must be determined by the circumstances of the particular bank, by the kind of business carried on by those dealing with it, and by the condition of the community in which it is established.' Dunbar, *Theory and History of Banking*, p. 20.
[228] Wagner, *System der Zettelbankpolitik*, p. 428.
[229] Wagner, *System der Zettelbankpolitik*, p. 431.
[230] Wagner, *System der Zettelbankpolitik*, p. 425.
[231] Bagehot, *Lombard Street*, p. 121.

agreed with Wagner on the two functions of capital, creating trust and covering losses. Comparing the Swiss and German banks to their English counterparts, Somary noted that English banks did not engage in long-term lending. Therefore, the (low) risks on the asset side did not require additional capital, as was the case with banks in Germany or Switzerland.[232] Reflecting on Gilbart's 'one-third-requirement', Somary stated in 1915 that such ratios were 'unimaginable in present times'.[233]

4.1.2. Capital, Risk and Return

As seen in the various statements on capital above, the authors understood the relationship between capital and risk. Later contributions in particular emphasised that assets with longer durations which could not be sold within a short time would require higher capital ratios, as did assets with high potential losses. These observations directly addressed the topics of solvency and liquidity. What did the literature reveal about the effect of a high capital/assets ratio on return on equity? Were trade-offs between these two ratios discussed?

Although the terms 'leverage', 'return on equity', or 'capital/assets ratio' were not used in the 19th century, contemporaries understood their meaning and relationships. Instead of 'return on equity', bank managers would discuss the extent of dividends. In 1873, Bagehot commented on the leverage effect with the concise notion that 'the main source of the profitableness of established banking is the smallness of the requisite capital'.[234]

The discussion on the adequate relationship between 'profitableness' and 'capital' in 19th century England usually materialised as a conflict of interest between shareholders and depositors. In 1834, Gilbart referred to the diverging interests of depositors and shareholders as the 'evil' of having 'too small a capital' and 'too large a capital' at the same time.[235] On the one hand, Gilbart emphasised the high potential losses of large banks in absolute terms. He also believed that it would be alarming if banks paid dividends as high as 15% or 20%. On the other hand, he argued that capital might be used inefficiently in the case of abundance.[236] Joplin made similar considerations. The idea of capital being a guarantee for depositors was featured in almost all publications

[232] Somary, *Bankpolitik*, pp. 5–9.
[233] Somary, *Bankpolitik*, p. 10.
[234] Bagehot, *Lombard Street*, p. 114.
[235] Gilbart, *The Principles and Practice of Banking*, p. 309.
[236] Gilbart, *The Principles and Practice of Banking*, p. 309.

that discussed capital. Moreover, contemporaries perceived adequate capital as the result of a compromise between the capital's role as a guarantee and the profitability of capital for the shareholders. The next section analyses how banks commented on changes in their capital structure. As will be shown, the conflict of interest between shareholders and depositors was an often-discussed issue.

4.2. Capital Ideas in the Practice of Banking

The following sections analyse the capital policies of joint-stock banks. Did their behaviour reflect the suggestions made by the banking literature? And what factors did banks consider when issuing new capital? One way to answer these questions is to analyse the statements made by banks at their annual shareholder meetings or in their annual reports.

4.2.1. England: The Interests of Shareholders and Depositors

The London & Westminster Bank and the London and County Bank serve as examples of large and influential English joint-stock banks. The London & Westminster Bank was the first joint-stock bank established in London in 1834. The new bank was greeted with hostility in professional banking circles. Neither private or country bankers nor the Bank of England welcomed the establishment of a new competitor in London.[237] Two years later, in 1836, the London and County Bank was established as the Surrey, Kent and Sussex Banking Company in London (Southwark).[238]

By the turn of the century, the two banks ranked third and sixth in terms of size among the English joint-stock banks.[239] The banks merged in 1909 to form the London County & Westminster bank. This amalgamation was the first among joint-stock banks of 'the first magnitude', creating the second-largest joint-stock bank in England at the time.[240] Another merger took place with Parr's Bank in 1918. By 1919, the then London County Westminster & Parr's Bank was the third-largest bank in England, ranked in size after

[237] Theodor Emanuel Gregory, *The Westminster Bank Through a Century, Volume 1* (London: Oxford University Press, H. Milford, 1936), p. 63ff.
[238] Gregory, *Westminster Bank, Vol. 1*, p. 322ff.
[239] Measured by total assets. Author's calculations, based on the Banking Supplement of *The Economist*.
[240] The Bankers' Magazine, 'The Important London Amalgamation', 1909, 346–50 (p. 346).

Lloyds and the London Joint City & Midland Bank.[241] In 1968, Westminster merged with the National Provincial Bank, becoming the National Westminster Bank.[242] The bank is in present days known as NatWest and is part of the Royal Bank of Scotland Group.

Two people who contributed substantially to the British banking literature were also crucial figures in the establishment and evolution of the London and County Bank and London & Westminster Bank. Thomas Joplin, who had published essays on banking in 1822 and was a strong proponent of the idea of joint-stock banking, was involved in the establishment of the London and County Bank.[243] James William Gilbart became the first General Manager of the London and Westminster Bank in 1833. He stayed in this position for 27 years, shaping the bank's evolution during its first decades.[244]

There are several good reasons for choosing these two banks for a closer analysis of capital ideas. As discussed, the two banks became influential joint-stock banks and were amongst the first large banks with roots in the very early period of English joint-stock banking. Thus, their capital position can be traced from the early period of English joint-stock banking. Moreover, balance sheets and income statements are available from the beginning of their establishment. Banks did not have to publish assets and liabilities if they were established under the Country Banker's Act of 1826 (as was the case for these two banks).[245] Nevertheless, the respective data is available as well as partly compiled and discussed by Theodor E. Gregory's two-volume history of the Westminster Bank.[246] Finally, the limited data available for the English banking market also leaves no other option than to turn to individual banks. Aggregated data for the whole English banking market was only published after 1880.[247]

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[241] 1918 marked the end of a series of large amalgamations in English banking. London Joint City and Midland Bank itself was the result of a merger of the London City and Midland Bank with the London Joint Stock Bank.
[242] For a history of the London and Westminster Bank, the London and County Bank as well as Parr's Bank, which amalgamated with London County & Westminster in 1918, see: Gregory, *Westminster Bank, Vol. 1*. Theodor Emanuel Gregory, *The Westminster Bank Through a Century, Volume 2* (London: Oxford University Press, H. Milford, 1936)., Ralph Hale Mottram, *The Westminster Bank, 1836-1936* (London: Westminster Bank, 1936).
[243] Gregory, *Westminster Bank, Vol. 1*, p. 322ff.
[244] RBS Heritage Hub, 'James William Gilbart' <http://heritagearchives.rbs.com/people/list/james-william-gilbart.html> [accessed 26 April 2017].
[245] *Country Bankers Act*, c. 46.
[246] Gregory, *Westminster Bank, Vol. 1*; Gregory, *Westminster Bank, Vol. 2*.
[247] See: 'The Economist Banking Supplement, Various, 1861-1946'. Another, early data source is John Dun, *British Banking Statistics: With Remarks on the Bullion Reserve and Non-Legal-Tender Note Circulation of the United Kingdom.* (London: E. Stanford, 1876).

Capital Structures at the Beginning of English Joint-Stock Banking: The Example of Westminster

Figure 9 shows the capital structure of the London and Westminster Bank in 1844, ten years after the establishment of the bank. It serves as an example of capital structures in English joint-stock banking. Westminster had an authorised capital of £5m, split up into 50,000 shares of £100 each. By then, shareholders had subscribed £4m of the authorised capital. Of the subscribed capital of £4m, £800,000 was paid-up. The rest was capital liability. The total shareholder liability, however, was far greater than the capital liability because the bank operated under unlimited liability until 1880. Moreover, it has to be noted that the shares of the London and Westminster Bank were not fully subscribed until 1847 – thirteen years after the bank's foundation.[248]

The capital structure visualised in Figure 9 allows us to compute several ratios. Adding reserves and retained profits to the paid-up capital, one can calculate the total capital. Compared to total assets, capital stood at 24.1% (capital/assets ratio). The capital/deposits ratio was 31.8%. Total subscribed capital as a percentage of total assets was 113.4%. The dividends paid to shareholders were determined semi-annually and based on paid-up capital. In 1844, it was 6% of £800,000.

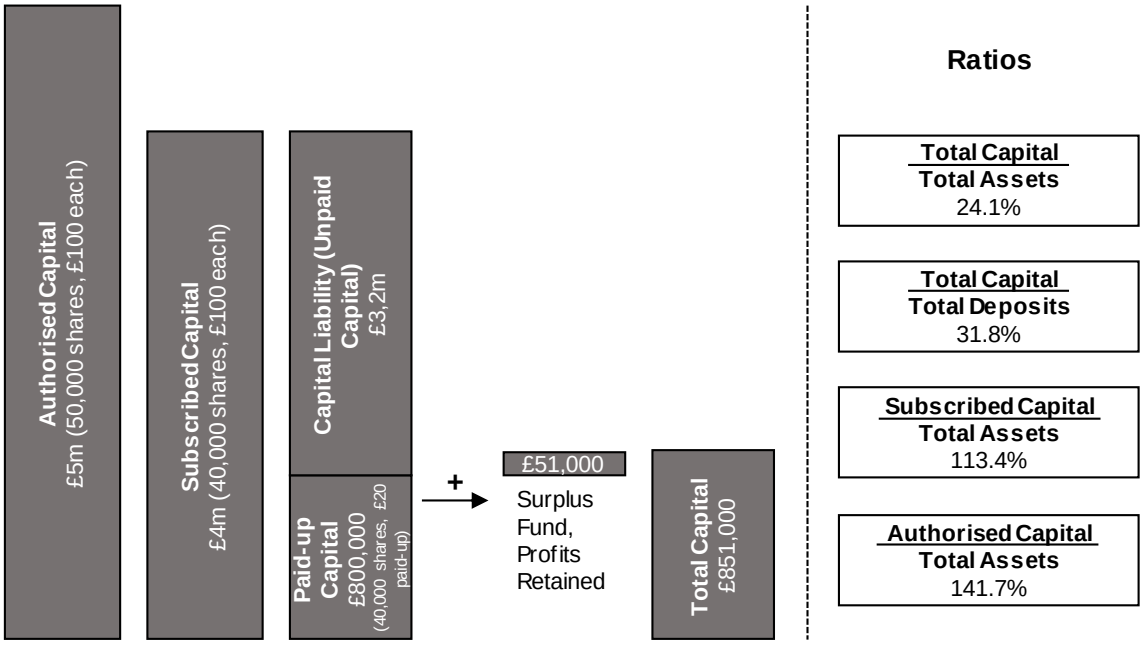

Figure 9: Capital Structure of the London and Westminster Bank, 1844

[248] The Bankers' Magazine, 'Reports of Joint-Stock Banks. London and Westminster Bank', 1848, 264–65 (p. 264).

Figure 10 shows the capital/assets ratios (left axis) and the authorised capital (right axis) of the London and County Bank as well as the London and Westminster Bank from 1834 and 1837 to 1908. The capital/assets ratios of both banks reached their low points in the 1860s. The authorised capital was raised substantially twice, in the mid-1860s and in 1878.

The two banks increased their capital in various ways. Firstly, they could call up further instalments from their shareholders and raise the fraction that was paid-up. Secondly, they sold additional shares from authorised capital that was not yet fully subscribed, which led to an increase in the paid-up capital. Furthermore, the reserves grew if investors bought shares with a premium. Thirdly, the authorised capital could be raised, which required the consent of shareholders.

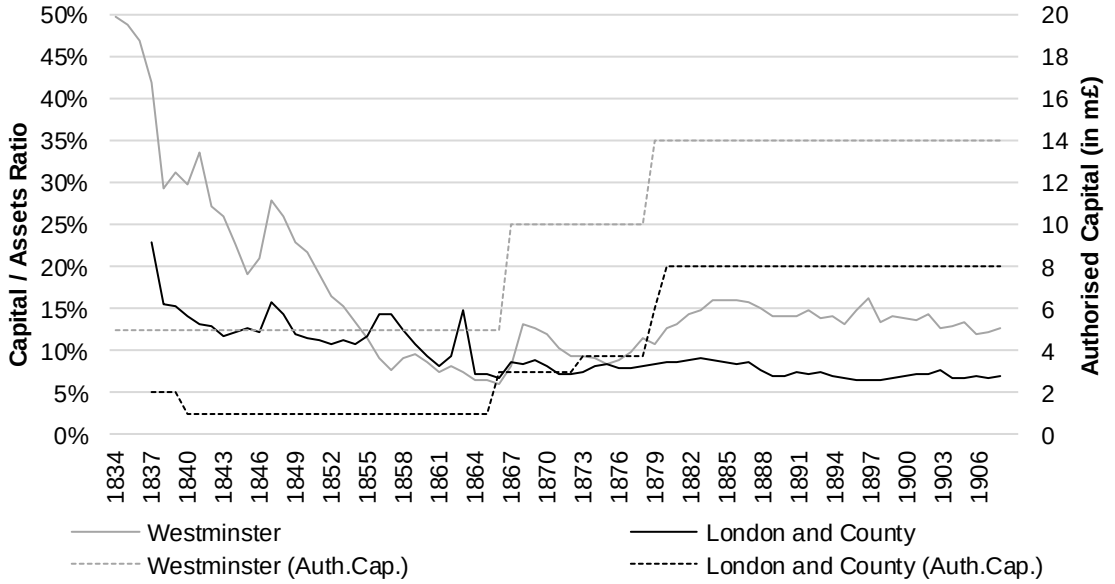

Figure 10: Capital/Assets Ratios and Authorised Capital in Million £, Westminster Bank (1834-1908) and London and County Bank (1837-1908)[249]

Large Capital as a Distinguishing Feature of the Early Joint-Stock Banks

The London and Westminster opened doors in 1834 with an authorised nominal capital of £5m, of which £1.7m was subscribed by proprietors (shareholders) in the first year of business. The paid-up capital stood at £182,000, representing 49.7% of total assets –

[249] Author's calculations. Data: Gregory, *Westminster Bank, Vol. 1*; Gregory, *Westminster Bank, Vol. 2*.

well within Gilbart's 'one-third-requirement'.[250] The London and County bank started operating three years later with an authorised nominal capital of £2m, of which also only a fraction was subscribed in the first year. The bank started with a paid-up capital of £24,000, representing a capital/assets ratio of 22.9%.

The fact that both Westminster and London and County started operating without having their authorised shares fully subscribed by shareholders was not unusual. The Country Bankers Act of 1826 allowed the establishment of joint-stock banks for the first time outside a 65-mile radius of London, but banks continued to be mostly unregulated.[251] The act did not introduce a charter requirement, nor did it set standards for the organisation or management of banks. There was no minimum nominal capital and no rule that a certain number of shares would have to be paid up before a bank started its operation. Theoretically, banks could have commenced business with no shares subscribed at all.[252] A 'Secret Committee on Joint Stock Banks', tasked by the Parliament with analysing the effects of the 1826 Act in 1836, showed that only 15.8% of the nominal capital of English banks was paid up.[253] Setting the authorised capital very high and without any direct relation to expected business activities might have been done intentionally in many cases. On the one hand, it created an impression of ambition and high expectations for prospective shareholders. On the other hand, a significant capital signalled strength to depositors.[254]

In the second year of business, both banks' authorised capital was still about nine times the amount of the balance sheet. This ratio continued to be high in subsequent years. Table 7 shows the total capital resources (authorised capital and reserves) as a percentage of total assets. In the 1840s, the Westminster's total capital resources were on average about 1.4 times the size of its balance sheet total.

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[250] For the annual reports of the first 13 years, see: James William Gilbart, *A Record of the Proceedings of the London and Westminster Bank, during the First Thirteen Years of Its Existence with Portraits of Its Principal Officers* (London: R. Clay, Bread Street Hill, 1847).
[251] *Country Bankers Act*, C. 46.
[252] Secret Committee on Joint Stock Banks, *Report from the Secret Committee on Joint Stock Banks: Together with the Minutes of Evidence, and Appendix*, 1838. The only step towards more regulation was the requirement to make a return to the Stamp Office, providing information about the company before commencing business; see: *Country Bankers Act*, C. 46 Appendix, A & B.
[253] *Strictures on the Report of the Secret Committee on the Joint Stock Banks with an Appendix Containing Some Valuable Tables, Compiled from the Evidence* (London: Joseph Thomas, 1836), pp. 19–21.
[254] Samuel Evelyn Thomas, *The Rise and Growth of Joint Stock Banking* (London: Sir I. Pitman & Sons, 1934), p. 222.

	Westminster		London and County	
	Total Capital Resources / Total Assets	C/A Ratio	Total Capital Resources / Total Assets	C/A Ratio
1841-1850	137.8%	24.8%	77.5%	12.9%
1851-1860	54.0%	12.0%	25.1%	11.7%
1861-1870	35.3%	8.8%	17.0%	8.8%
1871-1880	39.7%	10.0%	19.1%	8.0%
1881-1890	53.1%	14.9%	25.4%	8.3%
1891-1900	50.2%	14.2%	20.2%	6.9%
1901-1910	47.2%	12.1%	18.8%	7.0%

Table 7: Total Capital Resources (Authorised Capital and Resources) in Percent of Total Assets, Westminster Bank and London and County Bank, Averages per Decade, 1841-1910[255]

Westminster's capital/assets ratio remained above 20% until 1850 and was still roughly within Gilbart's 'one-third-requirement'. As Gilbart himself outlined, having a significant capital was one of Westminster's fundamental principles. The Bank should be 'prepared at all times for a withdrawal of its deposits – to be able to give adequate accommodation to its customers – and to support public confidence in seasons of extreme pressure'.[256]

However, operating with a high capital ratio was also a way of distinguishing the legal form of the bank from private banks. Gilbart argued that private banks did not 'carry on business with their own capital, but merely upon their credit'.[257] As Westminster stressed in its first prospectus for potential shareholders, capital was one of the main advantages of joint-stock banks compared to private banks.[258] The future bank promoted that it should be established 'with such an extent of Capital as will ensure the perfect confidence and security of depositors, and the greatest practical accommodation and assistance to trade and commerce.'[259]

Conflicting Interests: Shareholders vs Depositors

In the years after the foundation of the Westminster bank, its chairmen frequently justified capital increases as a way to foster public confidence – and more specifically, depositors'

[255] Author's calculations. Data: Gregory, *Westminster Bank, Vol. 1*; Gregory, *Westminster Bank, Vol. 2*.
[256] Gilbart, *Proceedings London and Westminster Bank*, p. 7.
[257] Gilbart, *Proceedings London and Westminster Bank*, p. 6.
[258] 'The advantages of Joint Stock Banks are obvious: Their capital cannot be diminished by either deaths or retirements; their numerous Proprietors ensure to them confidence and credit, as well as ample business in deposits, loans, and discounts.' Gilbart, *Proceedings London and Westminster Bank*, p. 15.
[259] Gilbart, *Proceedings London and Westminster Bank*, p. 15.

confidence.[260] The bank was anxious to balance both the interests of shareholders and depositors. When shareholders questioned the increases of the reserve fund at general meetings, the board argued that no one should be able to accuse the bank of not augmenting the reserves 'whilst it went on increasing its dividends'.[261]

Similarly, in 1862, the Westminster bank maintained that it wanted to pay high dividends, but also emphasised that extensive reserves were required as a sign of 'prudence and safety' for depositors.[262] Five years later, the bank urged its shareholders once again to increase the capital, arguing that depositors should be offered more than the existing capital 'as an immediate security for the payment of their liabilities'. However, the bank promised to make the capital increase 'as advantageous as possible for the shareholders'.[263]

The London and County Bank used a similar line of argumentation to justify capital increases to its shareholders. By 1857, the bank had capital and reserves of £600,000 in its balance sheet. Their capital/assets ratio was 14.3%. At the annual meeting in 1857, London and County's chairman stated that the paid-up capital invested in the bank should be of 'fair proportion' and that this capital would have 'to carry the weight of the customers' balances'.[264] In 1862, another substantial increase of capital was necessary, according to the chairman of London and County, in order 'to be in the front rank of joint-stock banks'.[265] The chairman argued that the bank's growth, primarily driven by advances to railway companies, should not be financed with customers' deposits. At the same time, the chairman replied to criticism from the shareholders by emphasising that additional capital now would mean that they would need to add less to the reserve fund

[260] See Gilbart, *Proceedings London and Westminster Bank*, pp. 55, 74.: 'This increase of Capital will, in the opinion of the Directors, have a beneficial influence, as it gives the Bank an additional claim upon public confidence, and ensures the means of conducting, with satisfaction to its customers, a more extensive business.'
[261] The Bankers' Magazine, 'Reports of Joint-Stock Banks. London and Westminster Bank', 1857, 167–72 (p. 172).
[262] The Bankers' Magazine, 'Reports of Joint-Stock Banks. London and Westminster Bank', 1862, 90–95 (p. 92).
[263] The Bankers' Magazine, 'Reports of Joint-Stock Banks. London and Westminster Bank', 1867, 804–9 (p. 807).
[264] The Bankers' Magazine, 'Reports of Joint-Stock Banks. London and County Bank', XVII (1857), 241–47 (p. 244).
[265] The Bankers' Magazine, 'Reports of Joint-Stock Banks. London and County Bank', 1864, 280–83 (p. 282).

in the future. Hence, London and County could share all its profits with the shareholders.[266]

As London and County raised additional capital in 1872, the chairman once again maintained that the relation of capital and reserves to liabilities should be 'fair'.[267] However, how much did London and County's chairman consider as fair or adequate? He referred to a target ratio of capital to liabilities of 10%.[268] Moreover, he commented that London and County had increased its capital in past years if the capital/liability ratio fell below 7%, and additional capital was necessary to 'keep up our position' compared to competitors.[269]

In comparison to other large joint-stock banks, London and County's capital ratio (7.15%) was actually among the lowest. In 1872, Westminster had a capital/assets ratio of 9.4%, National Provincial had a ratio of 8.1%, and the London Joint Stock Bank 8.2%. With that in mind, the chairman of London and County confirmed once again that a 10% ratio was considered a 'fair proportion' in 1873.[270] However, such ratios represented a significant shift in ideas among English banks, who had now moved away from the initial idea in the 1820s and 1830s that joint-stock banks would need to have a substantially high capital in order to distinguish themselves from private banks.

The City of Glasgow Shock

Despite frequent references to the importance of a high capital/liability ratio in gaining the trust of depositors, the capital/assets ratios of major English joint-stock banks had been falling since their establishment in the 1830s. The collapse of the City of Glasgow Bank in 1878, however, can be considered as a turning point for the trend towards lower capital ratios. The reversal of the trend, however, did not last long.

Like most other banks at the time, the City of Glasgow Bank operated under unlimited liability, and its failure led to the bankruptcy of most of the shareholders.[271] Even though

[266] The Bankers' Magazine, 'Reports of Joint-Stock Banks. London and County Bank', *Reports of Joint-Stock Banks. London and County Bank*, pp. 282–83.
[267] The Bankers' Magazine, 'Reports of Joint-Stock Banks. London and County Bank', 1872, 788–94 (p. 792).
[268] Capital/assets ratio of 9.1%
[269] The Bankers' Magazine, 'Reports of Joint-Stock Banks. London and County Bank', *Reports of Joint-Stock Banks. London and County Bank*, p. 792.
[270] The Bankers' Magazine, 'Reports of Joint-Stock Banks. London and County Bank', 1873, 854–60 (p. 857).
[271] Acheson and Turner, *The Death Blow to Unlimited Liability*. Sydney George Checkland, *Scottish Banking: A History, 1695-1973* (Glasgow: Collins, 1975), p. 471.

banks could register with limited liability from 1857 onwards, most banks continued to operate with unlimited liability until 1878, as unlimited liability was often seen as an essential guarantee for depositors.[272] Not surprisingly, contemporaries expected substantially higher capital ratios, as higher capital levels would replace the unlimited liability. In an article titled 'The Great Addition About to Be Made to the Capital Employed in Banking Enterprise', *The Bankers' Magazine* argued that the ratio of capital to liabilities would be 'altered materially' with the introduction of limited liability. In fact, *The Bankers' Magazine* estimated that the new average capital/liability ratio would stand around 20%.[273]

Indeed, both Westminster and London and County increased their authorised capital in 1878 (see Figure 11). The two banks justified the increases with additional security needed for their depositors. Having abandoned unlimited liability, they did not want their stability to be questioned by customers.[274] At the same time – once again – the banks tried to find a 'good middle course as between the interests of the shareholders and the customers.'[275]

Besides Westminster and London and County, the National Provincial Bank also changed to limited liability and increased its capital. Lloyds and Midland, also displayed in Figure 11, were already operating with limited liability before 1878 and did not issue additional capital. This behaviour is not surprising. John Turner analysed a broader sample of 63 English banks for the year 1874, when some banks were already on limited liability and others not. Turner shows that limited liability banks had higher capital ratios than those with unlimited liability in 1874.[276]

John Turner also provides a valuable contribution on the debate surrounding shareholder liability in British banking. Turner highlights that the debates focused on the credibility of unlimited liability regimes and the question of how depositors could be assured of bank

[272] Allen and others, *Commercial Banking Legislation And Control*, p. 232.
[273] The Bankers' Magazine, 'The Great Addition About to Be Made to the Capital Employed in Banking Enterprise', 1880, 28–29 (pp. 28–29).
[274] The Bankers' Magazine, 'Reports of Joint Stock Banks. London and Westminster Bank', 1880, 129–32 (p. 131). The Bankers' Magazine, 'Reports of Joint Stock Banks. London and County Bank', 1880, 230–33 (p. 232). This view is also supported by Turner, who attributes the late change to limited liability to concerns about the safety of depositors. Turner, *The Last Acre and Sixpence*, p. 124.
[275] Chairman of London and County at the annual meeting in 1880. The Bankers' Magazine, *Reports of Joint Stock Banks. London and County Bank*, p. 232.
[276] Turner, *Banking in Crisis*, p. 126.

safety once a bank would change from unlimited to limited liability.[277] Turner shows that William Clay, a member of Parliament from 1832 to 1857, outlined the relevant issues for discussing unlimited and limited liability already in 1836 (limited liability, paid-up capital, publicity). Clay argued that the change to limited liability would require forms of assurances to depositors concerning banking stability. The issues outlined by Clay were later discussed by banking experts, most notably Walter Bagehot and George Rae.[278] Resulting from this debate, the reserve liability was included in the Company Law in 1879.[279]

Figure 12 shows the capital/assets ratios of six joint-stock backs and the average ratio of all joint-stock banks. On average, the banks' capital/assets ratios increased slightly due to the capital increases of Westminster and London and County. By 1880, the capital/assets ratio stood at 17.5% (=capital/liability ratio of 21.4%). This level was considered as the new standard by *The Bankers' Magazine* after the elimination of unlimited liability. The new standard, however, deteriorated quickly. At the turn of the century, the capital/assets ratio stood at 11.6%. From 1880 to 1913, the capital/assets ratios of English joint-stock banks fell by 8.6 percentage points.

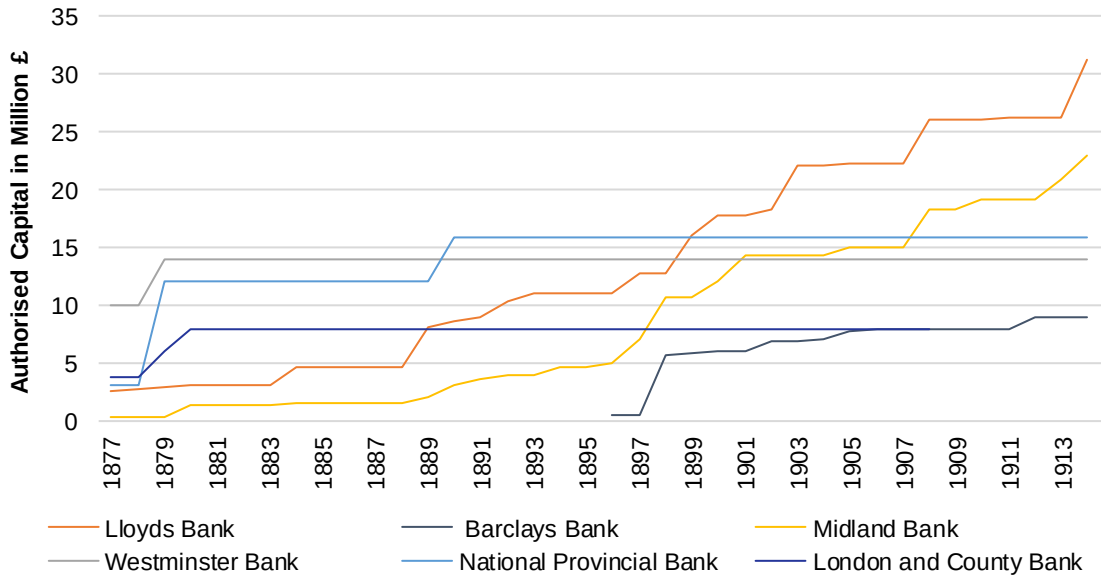

Figure 11: Authorised Capital, Selected Banks, 1877-1914[280]

[277] Turner, *The Last Acre and Sixpence*, pp. 111-27.
[278] Turner, *The Last Acre and Sixpence*, pp. 115-21.
[279] See also Section 3.5.1.
[280] Data: 'The Economist Banking Supplement, Various, 1861-1946'.

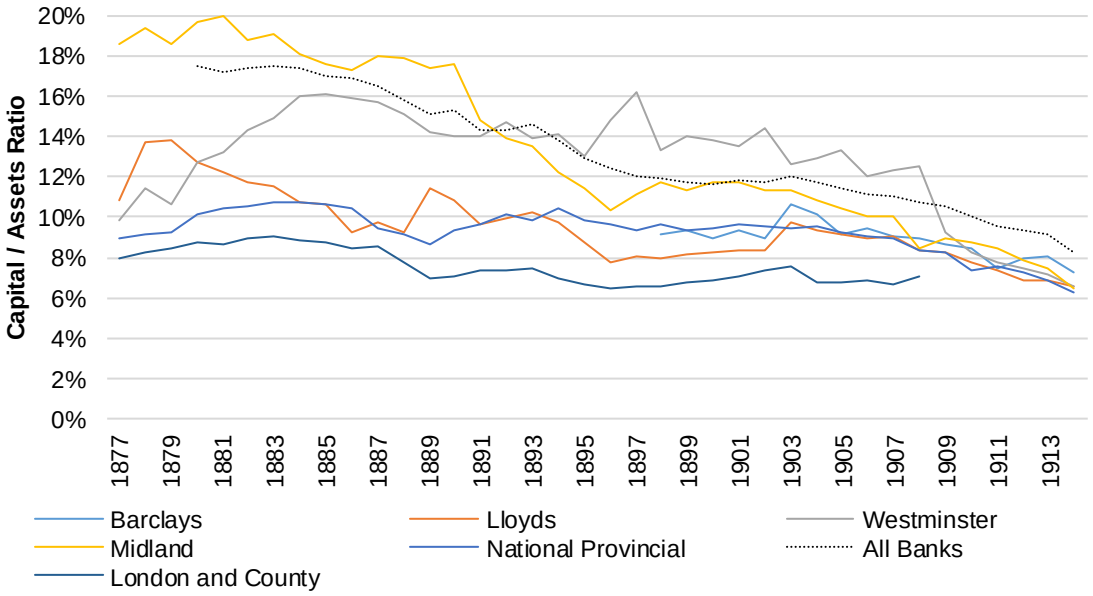

Figure 12: Capital/Assets Ratios, 1877-1914[281]

The 20th Century View on Capital – Shareholders' Interests Prevail

After the failure of the City of Glasgow Bank, the public and bank managers viewed recapitalisations as a necessity to maintain public confidence in the banks. Conversely, at the beginning of the 20th century, having too much capital was disparaged.

Once again, Westminster proves to be a case in point. The capital/assets ratio of the Westminster Bank was above the average of English joint-stock banks between 1895 and 1908 and was substantially higher than the ratio of any of its competitors shown in Figure 12. This high capitalisation was considered a problem at the Westminster Bank for many years.[282] Beyond the capitalisation itself, the structure of their capital was also viewed as problematic. Westminster's paid-up capital was twice as big as its reserves. Most other banks had reserves almost exceeding the paid-up capital. Consequently, Westminster was struggling to pay dividends as high as its competitors, given the high capital ratio. And not only was the capital ratio high, but the proportion of paid-up capital within the company's total capital was considered high too.[283]

Westminster saw the merger with the London and County Bank in 1908 as a solution to that problem. At the extraordinary general meeting in 1908, Westminster's chairman Walter Leaf presented the bank's capital/liability ratio as one of the main reasons for the

[281] Data: 'The Economist Banking Supplement, Various, 1861-1946'.
[282] Gregory, *Westminster Bank, Vol. 1*, p. 292.
[283] The Bankers' Magazine, *The Important London Amalgamation*, p. 349.

merger. Referring to Westminster's capital/liability ratio of 11% in 1907, Leaf argued that the ratio of London and County was below 5%, 'and it certainly could not be said that the larger figure [Westminster's] was necessary for the credit of their company'.[284] In a similar vein, *The Bankers' Magazine* commented that Westminster's capital was 'out of proportion' and that it would have been difficult to adjust the ratio if not through an amalgamation.[285] In contrast to previous discussions on the adequacy of the level of capital, neither the interests of depositors nor their confidence in the bank seemed to be of major importance anymore. Instead, Leaf remarked that their shareholders would be 'better protected by a reduced liability'.[286]

The newly established London County and Westminster Bank had a paid-up capital of £3.5m and reserves of £4.25m. The capital/assets ratio of London County and Westminster stood at 9.2%, 3.3 percentage points below the ratio of Westminster before the merger. With that, the capital structure of the 'new' Westminster converged towards that of its peers (see Figure 12).

Contemporary banking literature provides essential insights into the management of banks and their capital structure. Conflicting interests between shareholders and depositors with regards to the level of capital were frequently discussed in this literature. It was also a central topic within the managements of English joint-stock banks from their emergence in the 1820s to the beginning of the 20th century. At the beginning of English joint-stock banking, having a significant capital seemed to be of importance. Furthermore, target capital ratios – such as Gilbart's 'one-third-requirement' – were used. The Westminster Bank seemed to follow that guideline until the 1850s. The London and County Bank communicated a capital/liability target ratio of 10% in the 1870s, which was probably the convention for joint-stock banks at the time. In subsequent years, capital considerations became more nuanced, stressing the required balance between shareholders' and depositors' interests. After the turn of the century, shareholders' interest in low capitalisation and high dividend payments seem to have prevailed, leading to even lower capital/assets ratios. The question, therefore, arises whether Swiss banks had a similar understanding of capital adequacy to their English counterparts.

[284] The Bankers' Magazine, 'Reports of Joint Stock Banks. London and Westminster Bank', 1909, 438–39 (p. 439).
[285] The Bankers' Magazine, *The Important London Amalgamation*, p. 349.
[286] The Bankers' Magazine, 'Reports of Joint Stock Banks. London and Westminster Bank', *Reports of Joint Stock Banks. London and Westminster Bank*, p. 439.

4.2.2. Switzerland: The Relevance of Rules of Thumb

In the 19th century, many of the Big Swiss Banks discussed their capital level publicly. The following analysis focuses mainly on Credit Suisse. Where possible, the discussion of capital adequacy is broadened to the whole group of the Big Banks. However, in the absence of statutory accounting and publication standards, the availability of data and information remains fragmented.[287]

Founded in 1856 as 'Schweizerische Kreditanstalt', Credit Suisse is one of the oldest banks among the group of the Big Banks. Credit Suisse was the most transparent bank during the 19th century, providing comprehensive information on the state of their business and regularly discussing reasons for changes in the capital structure. Credit Suisse has been ranked among the biggest banks in terms of total assets during its entire lifespan.[288] The bank gained considerable importance in the financing of railway projects and industrial finance during the last third of the 19th century.[289]

Credit Suisse was founded with a nominal capital of CHF 30m, of which CHF 15m was paid-up. Shareholders were not liable beyond the nominal capital.[290] The bank discussed capital adequacy for the first time when it issued additional stocks of a nominal CHF 5m in 1873. The issuance of new capital brought its capital/assets ratio back to the 30% level after it had fallen below that threshold two years earlier. Credit Suisse justified the issuance by referring to increasing business activities both in Switzerland and abroad.[291] It has been stated that Credit Suisse profited from the strong economic activity in Switzerland, especially after the Treaty of Versailles in 1871.[292] Credit Suisse's Board of Directors emphasised the bank's international position:

[287] The only exception was minimum standards according to the Swiss Code of Obligations after 1883.
[288] Measured by total assets, Credit Suisse was usually the biggest or second biggest bank among the Big Banks (next to the Swiss Bank Corporation).
[289] Credit Suisse expanded domestically to become a universal bank in the 1930s. The bank also executed several major acquisitions in the 1990s (Bank Leu, 1990; First Boston, 1990; Swiss Volksbank, 1993; Winterthur Versicherungen, 1997). For the history of Credit Suisse, see: Martin Esslinger, *Geschichte der Schweizerischen Kreditanstalt während der ersten 50 Jahre ihres Bestehens* (Zürich: Orell Füssli, 1907); Walter Adolf Jöhr, *Schweizerische Kreditanstalt: 1856-1956* (Zürich: Schweizerische Kreditanstalt, 1956); Joseph Jung, *Von der Schweizerischen Kreditanstalt zur Credit Suisse Group: eine Bankengeschichte* (Zürich: NZZ Verlag, 2000).
[290] Esslinger, *Geschichte der Schweizerischen Kreditanstalt*, pp. 18–22.
[291] Schweizerische Kreditanstalt, *Jahresbericht Schweizerische Kreditanstalt 1973*, 1874, p. 3.
[292] Esslinger, *Geschichte der Schweizerischen Kreditanstalt*, p. 65.

> Based on the pleasant fact that the sphere of business of our institution is expanding both domestically and abroad, which naturally leads to higher expectations towards us, we must see it as a requirement of expedience to increase our capital to not only augment the capital available to us, but also to take into account our position which we have to secure in international transactions.[293]

Credit Suisse issued additional capital in 1889 and 1897. The stock issuance in 1889 again led to an increase in the capital/assets ratio from 22.3% to 30.4%. Similarly, the issuance of additional capital in 1897 lifted the ratio from 25.9% to 34.1%. It seemed that the bank aimed for a capital/assets ratio above 30%.

In the annual report of 1889, the bank cited the findings of an internal study paper on the 'question of the equity capital increase'. It is the most extensive public elaboration by the bank on why it required additional capital:

> 1. The balance sheet total grew from 72 million francs in 1872 to 96 million francs in 1888 […]. Only 5 million came from shareholder's capital […].
> 2. The proportion of own capital (shareholder's capital and reserves) to the debt capital […] was about 1:3.6 in 1872. By the end of November 1889, it was 1:3.5 and was therefore decreasing to the level before the last stock issuance.
> 3. Among the ca. 48 million current account receivables are, as known, many unsecured credits. With consideration of these [credits] and the risk naturally connected to it, it seems necessary to us to finance the required capital for the expanding business operations not exclusively through attracting more debt capital, but also through an increase of our own, liable capital.
> 4. Of outstanding importance seems to be that the turnover roughly doubled as compared to 1872. […]. Naturally, the brisk turnover requires a stronger capital, even more so, as individual deals have to be generally bigger today to provide an equal benefit […].
> 5. All these circumstances appear to secure an efficient use of the new capital. With regards to the current returns of the shares invested in Credit Suisse, it may

[293] Schweizerische Kreditanstalt, *Jahresbericht Schweizerische Kreditanstalt 1973*, p. 3. Similarly, the bank commented in a later report that the issuance of additional stocks in 1873 was due to the additional capital requirements resulting from increasing commerce and manufacturing in Zurich, Switzerland and abroad (Schweizerische Kreditanstalt, *Jahresbericht Schweizerische Kreditanstalt 1889*, 1890, p. 4.)

> be highlighted that the average dividend of our shares between 1857 and 1888 was 6.73%. For the last ten years (1879-1888), it was at 7.35%. […].[294]

Credit Suisse's Board of Directors argued in favour of higher equity capital by mentioning the fast balance sheet expansion, the proportion of equity capital to liabilities, the risk of potential losses arising from accounts due from customers without collateral, the expected strong demand for credit as a result of an increase in business activities in the past, and the high (and increasing) dividend performances in the past for its investors. The bank also communicated that it wanted to return to the capital ratio it maintained after its last stock issuance in 1873. It shows that Credit Suisse was aiming for a capital/assets ratio around 30%, for which it issued new stocks.

These arguments were not uncommon among the Big Banks. The Swiss Bank Corporation issued additional capital in the same years, citing rapid growth and its reputation as the reasons. Looking at the other Big Banks, the Board of Directors argued that these institutes could be perceived by customers as serious competitors due to their high capital ratios. Thus, the bank would require more capital to keep its standing. Towards its investors, the Swiss Bank Corporation made assurances that the fresh capital was just the minimum needed for the development of the bank and that the amount would ensure stable dividends in the future.[295]

In 1905, Credit Suisse commented on another stock issuance in its annual report, providing two arguments for raising its capital. Firstly, Credit Suisse was taking over the 'Bank in Zürich' and the 'Oberrheinische Bank' in Basel and needed new shares for a share swap with existing shareholders.[296] This was an often cited reason for capital issuances among the Big Banks.[297] Secondly, the bank once again stressed that the capital/liability ratio should not fall below a 'certain' level. The Board of Directors suggested a ratio of 1:3 (capital/liability ratio: 33%; capital/assets ratio: 25%) and

[294] Schweizerische Kreditanstalt, *Jahresbericht Schweizerische Kreditanstalt 1889*, pp. 4–5.
[295] Hans Bauer, *Schweizerischer Bankverein 1872-1972*, ed. by Schweizerischer Bankverein (Basel, 1972), pp. 81–83.
[296] Schweizerische Kreditanstalt, *Jahresbericht Schweizerische Kreditanstalt 1904*, 1905, pp. 40–43.
[297] The Swiss Bank Corporation, for example, issued fresh capital when it took over the 'Bank in Basel' in 1906 as well as 'Speyr & Co. and the 'Banque d'Escompte et de Dépòts Lausanne' in 1912. Schweizerischer Bankverein, *Jahresbericht Schweizerischer Bankverein 1906* (Basel, 1907); Schweizerischer Bankverein, *Jahresbericht Schweizerischer Bankverein 1912* (Basel, 1913).

emphasised that such a ratio would still allow for achieving an ‘adequate’ return for its shareholders:

> The development of our institution during the last eight years was positive; it is however also an obligation, that given the risks of our business operation as a trading and financing institute, we need to make sure that the capital strength of our bank does not fall below a certain ratio as compared to the debt capital. Even though the current ratio of about 1:3 is not inappropriate, it seems to us that the requested increase of our capital is in the interest of the reputation, the credit and the productivity of our institute. Even with the capital increase, we believe we can communicate the expectation that we will be able to provide appropriate returns, which will not be below previous returns.[298]

After a capital increase in 1904, the leverage ratio went up to 25.3%. With an additional equity issuance of CHF 15m in 1906, the bank increased its capital once again. As on earlier occasions, Credit Suisse assured its investors that it would pay stable dividends in the future.

In the years leading up to the First World War, Credit Suisse seemed to abandon its target capital ratio. 1905 marked the last year in which the bank made a specific statement on the size of capital that it aimed to maintain. From 1905 to 1914, capital/assets ratios decreased from 25.3% to 19.2%. The bank did not issue new shares until 1912, and only then as a result of the take-over of two banks.

A changing view on capital adequacy in later years was further demonstrated by Credit Suisse’s capital increase in 1927. The bank refrained from mentioning specific ratios or discussing the capital situation in more detail. Instead, the bank only remarked in rather general terms that its own capital and the debt capital should be in a ‘healthy proportion’ to each other.[299]

To sum up, the capital decisions of Credit Suisse during the first fifty years of its existence until 1905 seemed to be influenced by fixed guidelines. The bank recapitalised several times in order to maintain a capital/assets ratio of 30% and later of 25%. Figure 13 shows Credit Suisse’s capital/assets ratio as well as the total capital and reserves from 1857 to 1914. Until 1905, the bank issued new shares four times, usually when the capital/assets

[298] Schweizerische Kreditanstalt, *Jahresbericht Schweizerische Kreditanstalt 1904*, p. 43.
[299] Schweizerische Kreditanstalt, *Jahresbericht Schweizerische Kreditanstalt 1926*, 1927, p. 9.

ratio fell below the 20% or 25% threshold. What is also apparent from Figure 13 is the importance of the capital issuances not only for increasing the share capital but also for increasing the reserves. The premium between the nominal value and the share price was attributed to the reserves. During this period, it was mainly the premium on capital increases that led to growing reserves, and not retained profits.

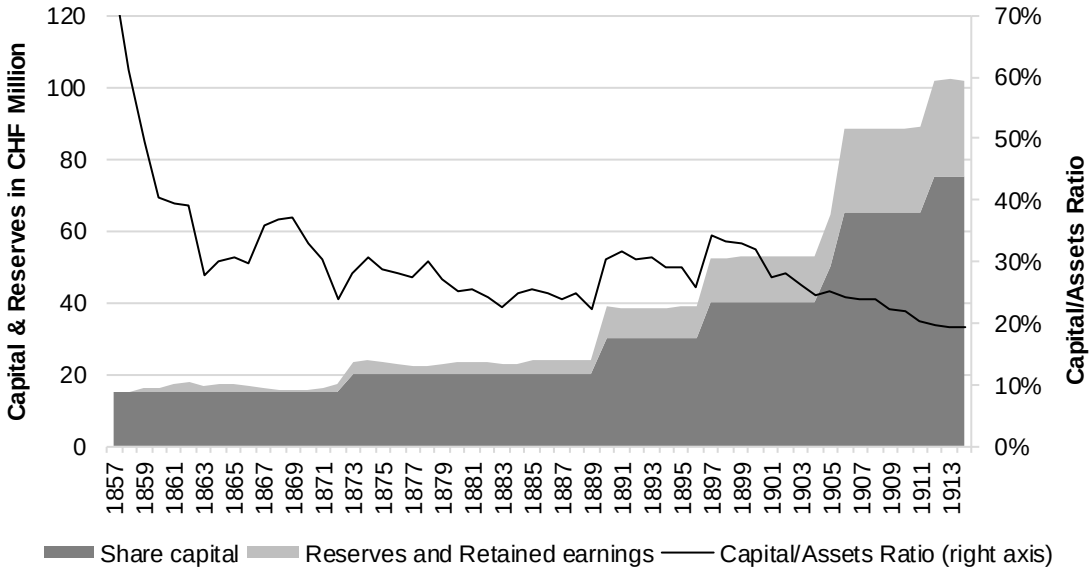

Figure 13: Share Capital, Reserves and the Capital/Assets Ratio of Credit Suisse, 1857-1914[300]

Swiss Banking Practice and the Role of 'Rules of Thumb'

Interestingly, the '1:3-rule' that was applied in Swiss banking practice was also promoted by James William Gilbart's *A Practical Treatise on Banking*, published in 1827. However, the Westminster Bank, of which Gilbart was the general manager from 1833 to 1860, abandoned that guideline in the 1850s. Did all Swiss banks nonetheless follow Gilbart's rule of thumb until the late 19th century, as the case of Credit Suisse would suggest?

It cannot be said that all Swiss banks followed Gilbart's principle. Most of the large joint-stock banks did, however, maintain capital/assets ratios above 20% until the end of the 19th century. Figure 14 shows the capital/asset ratios of the Big Banks from their establishment until 1914. The large drops in capital ratios at the beginning of the time

[300] Author's calculations. Data: Schweizerische Kreditanstalt, *Jahresberichte Schweizerische Kreditanstalt 1857-1914*, 1914.

series were due to the fact that the founders were very often ambitious regarding the growth of their business. Thus, capital ratios only 'normalised' over time once a bank started to make investments, grant loans and attract liabilities. As the banks grew, their capital/assets ratios began to fluctuate between 20% and 40%.

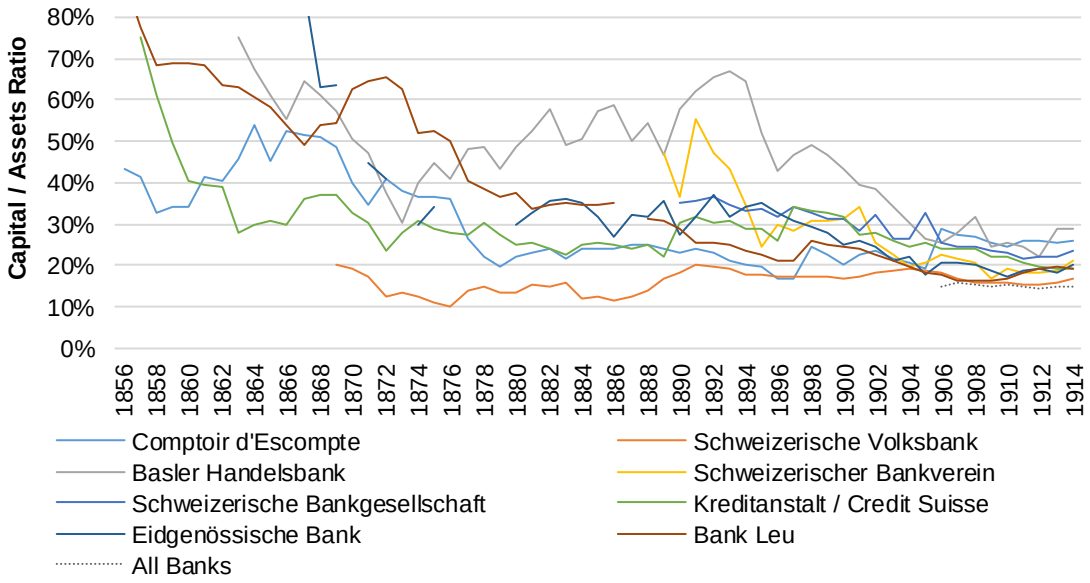

Figure 14: Capital/Assets Ratios, Big Banks, Switzerland, 1856-1914[301]

The bank with the lowest capital ratio throughout almost the entire period was the Swiss Volksbank. The Volksbank is the exception among the group of the Big Banks. It was not primarily established to provide credit for industrial and infrastructural projects. The bank started as a savings and loan bank for its private cooperative members, but also engaged in commercial loans towards the turn of the century and with that, pursued a business model similar to that of the other Big Banks.[302]

Until the 1940s, the Big Banks had considerably higher capital ratios than other bank groups in Switzerland. By 1914, the average capital/assets ratio of the Big Banks stood at 20.1%. Cantonal banks had a capital/assets ratio of 12.1% and Raiffeisen Banks a ratio of 3.3%. In earlier years, this discrepancy was even more prominent. Consequently, if Gilbart's ideas regarding capital (capital/liability ratio of 1:3) were present in

[301] Author's calculations. Data: Annual reports of the respective banks.
[302] For the history of the Swiss Volksbank, see: Schweizerische Volksbank, *Denkschrift der Schweizerischen Volksbank zur Feier ihres 50jährigen Bestandes - 1869-1919* (Bern, 1919); Emile Duperrex, *100 Jahre Schweizerische Volksbank - Schweizer Wirtschaftsleben, 1869-1969* (Bern: Schweizerische Volksbank, 1969); Jan Baumann, 'Bundesinterventionen in der Bankenkrise 1931-1937: Eine vergleichende Studie am Beispiel der Schweizerischen Volksbank und der Schweizerischen Diskontbank' (Universität Zürich, 2007).

Switzerland, only one group of banks had adopted them. All other groups would have disregarded it, which is unlikely.

The Business Models of the Big Banks

What else explains the persistently high capital/assets ratios of the Big Banks? The answer lies in the business models of the Big Banks and how the banks themselves perceived the risks associated with their business. Credit Suisse referred to the riskiness of its business operations as an argument in favour of a high capital ratio, maintaining that the high risks required more capital. What exactly did this mean?

Thomas Husy argued that the comparatively high capital ratio of the Big Banks was due to their 'universal strategy' – referring to the variety of banking services they offered for industrial and commercial companies. Other banking groups, such as regional, savings, Raiffeisen, and Cantonal banks, focused mainly on deposits and mortgages for private customers, a business model which bore less risk.[303] Husy concluded:

> The fact that the Big Banks usually use a larger part of their liabilities for mid- and long-term credit to the domestic and foreign industry, and that they engage in a variety of business activities bearing high risks, requires a relatively high equity capital.[304]

Table 8 provides insights into the asset structure of the Big Banks in 1870, 1880, 1890, 1900, and 1910. Investing in securities and providing commercial loans were two key pillars of the Big Banks' business at the time. The table presents these two asset items as a percentage of total assets. As we are interested in the riskiness of such investments, the table shows only unsecured loans instead of all loans.

	1870	1880	1890	1900	1910
Securities	13.9%	11.9%	10.2%	8.0%	8.7%
Unsecured loans	n.a.	21.5%	23.0%	24.0%	16.9%

Table 8: Share of Securities and Unsecured Loans in Percent of Total Assets, Big Banks, 1870-1910[305]

[303] Husy, *Die eigenen Mittel*, p. 38.
[304] Husy, *Die eigenen Mittel*, p. 36.
[305] Author's calculations. Data: Individual Annual Reports. Notes: The following banks are missing for 1870: Swiss Bank Corporation (SBC), Union Bank of Switzerland (UBS), Comptoir d'Escompte

The share of unsecured loans to commercial customers fluctuated between 16.9% and 24.0%. It seems that the amount of unsecured loans as a percentage of total assets dropped at the beginning of the 20th century. Similar to the unsecured loans, the share invested in securities also fell over time. By 1910, banks were investing on average 8.7% of their assets in securities. In 1870, the percentage had stood at 13.9%.

One might also ask how well diversified the securities portfolio was. There was a high sectoral dependence on investments in railway companies. In the case of Credit Suisse, for example, around 40% to 60% of the stocks held between 1870 and 1910 were in railway companies. The largest amount was invested in the 'Nordostbahn'.[306] The 'Nordostbahn' was run by Alfred Escher, who was also the President of the Board of Credit Suisse.[307] Credit Suisse also invested in a variety of foreign securities. Overall, the bank followed a rather speculative business model until the 1880s.[308]

The lower shares of securities and unsecured loans in the balance sheets in 1910 indicates that banks had reduced the risks of their assets, which would allow for a lower capital ratio. Furthermore, another emerging business model among the Big Banks had an impact on the composition of their securities portfolio when they, together with the Cantonal banks, managed to establish a monopoly in the issuance of government securities.

The underwriting business of the Big Banks had been growing since their establishment. In 1897, Credit Suisse started a cartel with the Swiss Bank Corporation and the Union Financière de Genève. More banks joined in the following years, forming the 'cartel of the Big Banks'.[309] The cartel contract stated that all government bond issues of more than CHF 2m that were handled by a cartel member had to be forwarded to the cartel. The cartel members then shared the placement and its profits.[310] The power of the Big

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de Genève (CEG), Bank Leu. Missing for 1880: UBS and CEG. Missing for 1890 and 1900: UBS. Data on unsecured loans is only available from Credit Suisse, SBC, and Bank Leu.

[306] Schweizerische Kreditanstalt, *Jahresbericht Schweizerische Kreditanstalt 1870*, 1871; Schweizerische Kreditanstalt, *Jahresbericht Schweizerische Kreditanstalt 1890*, 1891; Schweizerische Kreditanstalt, *Jahresbericht Schweizerische Kreditanstalt 1910*, 1911.

[307] Escher was president of the board from 1856 to 1877 and from 1880 to 1882.

[308] Jöhr, *Schweizerische Kreditanstalt*, pp. 89–92.

[309] The first episode of a cartel among the Big Banks can be traced back to 1863 when Credit Suisse and the Basler Handelsbank agreed on a cartel contract in order to jointly organise the takeover and placement of shares and bonds. The two banks were joined by the Banque Commerciale Genevoise in the same year. The cooperation only lasted until 1867. See: Esslinger, *Geschichte der Schweizerischen Kreditanstalt*, p. 173.

[310] One reason for the establishment of the cartel was that banks faced increased competition for domestic government issues from French banks. The French banks profited from abundant domestic capital at low interest rates and were essential financiers of the Swiss government. By

Banks grew further when their cartel joined forces with the Association of Cantonal banks in 1911. Government financing on Federal and Cantonal level as well as the emission of bonds for the by then nationalised Swiss railway became impossible without the support of the Big Banks and the Cantonal banks.[311] Some of these securities were kept in the banks' balance sheets. The available data in the annual reports of the Big Banks indicates that the share of government bonds increased slightly in the years before the First World War.

Overall, three effects had altered the business models of the Big Banks by 1914. Firstly, the Big Banks had reduced the share of unsecured loans. Secondly, the share of securities had decreased. Thirdly, the banks had engaged in the underwriting business. These three changes lowered the overall risks of the banks and their balance sheets and might have justified lower capital ratios.

The perception of what amount of capital should be considered adequate has changed over time. Banks followed specific benchmarks of about 25% until the late 19th century. Most large joint-stock banks in Switzerland showed similar behaviour, as they frequently issued new stocks to restore their target capital/assets ratio. This behaviour seems to have changed during the decade leading up to the First World War, when capital issuances became less frequent. The riskiness of their business was an often-cited reason for issuing fresh capital and banks compared their standing with that of their competitors. Yet the variation of the capital ratios decreased over time. Stable dividends for investors were given high importance in the statements made by banks, something which is not surprising given that investors had to approve capital issuances. The trade-off that defined an adequate capital ratio for the Swiss Big Banks was usually one between the risk of the business model and the interests of the shareholders.

1907, the capital supply from France dried up, and the Cartel of the Big Banks became increasingly influential. Linder, *Die schweizerischen Grossbanken*, p. 110; Esslinger, *Geschichte der Schweizerischen Kreditanstalt*, p. 175.

[311] Linder, *Die schweizerischen Grossbanken*, p. 110.

4.3. Conclusion

Early banking literature established several basic ideas about bank capital. The key roles of capital were to serve as an absorber of losses and to increase depositors' confidence in the banks. The advantages and disadvantages of a high or low capitalisation were well understood when the large joint-stock banks started to emerge in England from the late 1820s onwards and in Switzerland after the 1850s. Furthermore, there was a basic understanding of the relation between risk and return: a risky business model required a higher capital ratio.

In the 19th century, the choice of a capital level was often described as a trade-off. In England, the main discussion dealt with the interests of shareholders and depositors. Banks often justified the decision to issue additional capital as a necessary compromise between safety for depositors and stable and attractive returns for investors. In Switzerland, the trade-off was more about dividends for investors versus the risk of the business models. The banks seemed to be eager to signal trustworthy and responsible behaviour in their business, being aware that their activities involved a comparably high risk. However, the role of depositors and their trust in the bank seemed to be slightly less important in Switzerland than in England. The Big Banks in Switzerland focused mostly on commercial customers in the 19th century. Deposits from private customers as a source of funding were of secondary importance.

Discussions on investors' interests versus depositors' interests as well as responsible business conduct were proxies for the balance between risk and return. Banks were balancing these factors when determining their capital/assets ratios. Therefore, they had an idea of what an adequate capital ratio at the time would be. In England, for example, the Westminster Bank seems to have followed the guidelines of its first manager James William Gilbart in its early years. Gilbart stipulated a capital/liability ratio of 1:3. However, the data shows that English banks soon abandoned such high capital ratios. Towards the end of the 19th century, it seems that a capital/liability ratio of about 10% was considered as 'fair'. In Switzerland, target ratios were higher at the start but also decreased over time. In contrast to the English banks, a capital/liability ratio of about 1:3 was considered as adequate for Swiss Big Banks until the turn of the century. It is evident that the Big Banks were particularly conscious of the risk of their business activities and thus deliberately chose a high capital level.

The capital/assets ratios fell in both countries, together with perceptions of ideal capital adequacy. How can this decrease be explained? The discussion of capital in banking became more differentiated over time. ‘Capital ideas’ developed from crude rules of thumb to nuanced discussions about the structure and risk of assets and liabilities. Knowledge of how to manage a bank and its risks developed as well. This knowledge might have allowed for lower capital ratios.

An excellent example of this is the changing business model of the Swiss Big Banks. It was clear to the banks’ managements and other contemporaries that unsecured loans and a high amount of securities posed risks. Reducing the share of these two asset items in the balance sheet meant that the banks would require less capital.

There were two common trends in Switzerland and England. Firstly, capital/assets ratios were high in the banks’ first years of establishment and subsequently fell. This evolution was natural, as banks started with a higher amount of capital, anticipating a certain volume of business in the future. Secondly, having a significant capital was a signal to potential investors and customers. It showed ambition with regards to the development of the venture and it fostered trust for creditors.

Trust was critical in an environment where joint-stock banks were a relatively new concept. In England, the new joint-stock banks of the 1830s had to differentiate themselves from the dominant private banks. In Switzerland, the legal structure of joint-stock companies already existed when the Big Banks were founded in the second half of the 19th century. Nevertheless, the concept of large-scale joint-stock banks for financing infrastructure projects as well as industrial and trading companies was new. In both countries, banks lacked a track record proving the success of their business model.

While having a substantial capital served to induce trust from creditors, having a stable dividend aimed to encourage trust from investors. Both the English and Swiss banks frequently emphasised that a new capital issuance would not endanger future dividends for their shareholders. Such statements highlight the role of dividends as an anchor in the capital policies of banks. It seems that the timing of a capital issuance did not only depend on the actual need for resources, but also on the prerequisite of being able to hold dividends constant once the nominal amount of capital was increased.

Related to the topic of trust is the legal structure – more specifically the shareholder liability – of the banks. Two examples from the two countries are worth mentioning again. First of all, savings banks in Switzerland that were founded as cooperatives with often

the unlimited liability of their members had substantially lower capital ratios than joint-stock banks. Within the group of the Big Banks in Switzerland, there was also one bank that had the legal structure of a cooperative. The Swiss Volksbank was founded as a savings bank but developed into a Big Bank by beginning to offer larger loans to commercial customers and entering the underwriting business. Despite ending up having a similar business model and therefore being a Big Bank, the Volksbank had the lowest capital ratio among the Big Banks in the 19th century. Secondly – in the English context – the legal framework of the 1870s provides an excellent natural experiment for the effect of shareholder liability on capital/assets ratios. At the time, some joint-stock banks were already operating under limited liability, others still under unlimited liability. Turner shows that limited liability banks had higher capital ratios than unlimited liability banks.[312] Thus, the liability of a bank was highly relevant for its capital level.

While this chapter has provided insights into how capital ideas developed, the next chapter sheds light on how the two World Wars and their financing irreversibly altered the conventions of capital adequacy. It is not surprising that adequate capital among banks became less important during wartime. More interesting, however, were the discussions on whether banks should return to pre-war capital ratios once the wars were over.

[312] Turner, *Banking in Crisis*, p. 126.

5. How War Overturns Conventions

The two World Wars mark turning points in the evolution of capital/assets ratios and the perception of capital adequacy. During the First and Second World Wars, three major factors contributed to a further leveraging of the banking system: government financing, inflation, and the generally unfavourable political and legal environment for the capital issuances of banks. Each of these factors on its own influenced the capital/assets ratios, but during wartime, these drivers jointly accelerated the deterioration of capital levels.

The capital/assets ratios of banks in Switzerland and the United Kingdom fell substantially during the two World Wars. Figure 15 shows the capital ratios of British and Swiss Banks from 1910 to 1950. In the United Kingdom, the capital ratios were already at a low level in 1914. During the First World War, the capital/assets ratios fell by 2.8 percentage points, from 8.3% to 5.5%. The Second World War brought another decline of 2.5 percentage points for UK banks, falling to only 3.0% in 1945. Swiss banks showed a similar deterioration in capital/assets ratios, albeit on a higher level.

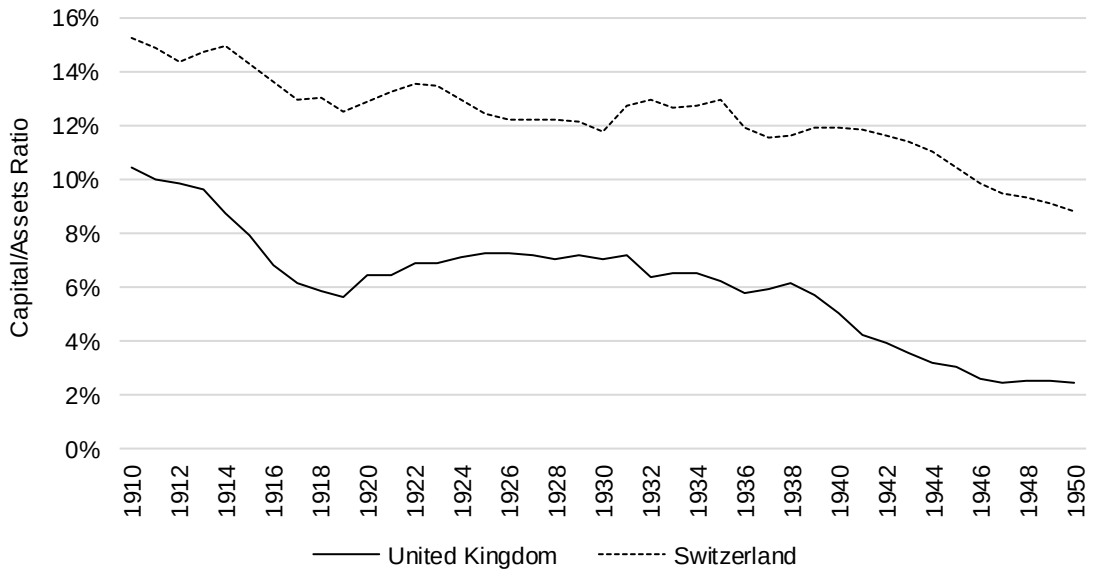

Figure 15: Capital/Assets Ratios, United Kingdom and Switzerland, 1914-1950[313]

Between 1914 and 1918, the capital/assets ratios of Swiss banks fell from 15.0% to 13.1%. From 1939 to 1945, the ratio fell from 12.0% to 10.4%. The decline in

[313] Author's calculations. Data: Swiss National Bank, *Die Banken in der Schweiz (annual issues 1906-2015)*; 'The Economist Banking Supplement, Various, 1861-1946'; Sheppard, *The Growth and Role of UK Financial Institutions*.

capitalisation was even more pronounced for the group of the Swiss Big Banks. Their capital ratios fell by 5.2 percentage points during the First and 4.4 percentage points during the Second World War. Capital ratios after 1945 were far from what was deemed adequate before the First World War. At the beginning of the 20th century, a capital/assets ratio of about 25% was the convention among the Big Banks in Switzerland. For British joint-stock banks, the conventional capital/assets ratio fluctuated around 10% (see Chapter 4).

Section 5.1 identifies patterns in balance sheets during the First and Second World Wars that explain why the banking systems became more leveraged. The analysis uses macroeconomic and banking statistics from Switzerland and the United Kingdom. Its goal is to provide insights into the characteristics of balance sheets in wartime. The economic dynamics of war financing were very similar both in the United Kingdom and in Switzerland: government debt grew, inflation rates were high, and banks became involved in the process of securing capital for the state. The two countries primarily differed in the amount of government debt accumulated during the two wars and the volume of debt that was held by banks.

While Section 5.1 deals with the reasons for the leveraging during the wars, Section 5.2 discusses why banks did or did not return to pre-war capital levels after the wars. Here, one can find many differences between the United Kingdom and Switzerland. A sub-section is dedicated to each country and each post-war period.

Section 5.3 concludes, showing how pre-First World War conventions for capital adequacy were overturned. Banks issued new capital in both Switzerland and the United Kingdom after 1918. Their motives, however, were very different. In Switzerland, the Big Banks in particular still intended to follow certain rules of thumb. In England, the amalgamation movement that had taken place before 1918 led to public concern for capital adequacy, which in turn resulted in substantial increases of paid-up capital. After the Second World War, the Bank of England emerged as an informal supervisor of the banking system, with a clear focus on liquidity rather than solvency. In the opinion of the Bank of England, liquidity was crucial for banking stability, while low capital ratios were a minor issue. There was no statutory banking legislation in the United Kingdom. Switzerland left the post-Second World War period in a different position. There was a formal supervisor of the banking system and statutory minimum capital requirements were in place. These formal requirements, introduced in 1934/1935, replaced to some extent the informal guidelines for capital adequacy.

5.1. Wartime Dynamics of Balance Sheets

Being an integral part of the economy and a facilitator of credit, banks play a central role in times of war. In the following, it will be outlined how far banks' balance sheets are a mirror of monetary and fiscal policy in wartime. The two World Wars resulted in bank balance sheets with very similar characteristics in Switzerland and the United Kingdom.

Some general observations can be made when looking at the effects of wartime monetary and fiscal policy on balance sheets. Firstly, banks became crucial providers of government debt by pooling deposits and investing in government bills and bonds. The large-scale investment in government debt had a profound impact on banks' balance sheets. The share of government investment increased substantially compared to other assets, leading to a structural change on the asset side.

Secondly, inflation rates and the velocity of money were high during both World Wars. The balance sheet items most affected by the rising price level were deposits. The rapid growth of deposits led to an increase of balance sheet totals. Moreover, the 'liquidity preference' of the public in uncertain times further contributed to the deposits' growth. Customers switched to financial products with shorter maturities, for example to accounts payable at short-notice or on demand.

Third, inflation undermines the value of paid-up equity capital. It is fixed and increases when a bank issues new capital. In real terms, the value of the paid-up capital is reduced by inflation. Besides the devaluation of the paid-up capital, the process of raising fresh capital was hampered in wartime by formal and informal constraints. In Great Britain, capital issuances had to be approved by a committee. There was no comparable regulation in Switzerland, but especially during the Second World War, it was deemed inappropriate to issue capital and compete with the state for the scarce resource of capital. The combination of restrictions on capital issuances, the devaluation of paid-up capital in real terms, and balance sheet expansion contributed substantially to the decline of capital/assets ratios.

When looking at deposits on the liability side and government investments on the asset side, the question is which of these items drove the growth of the balance sheet totals. Essentially, it is a question of demand (for government investments) or supply (of deposits). The discourse at the time indicates that deposits were the main driver of balance sheet growth during both wars. On the one hand, there was a reallocation effect on the asset side, which dampened the effect on the balance sheet total at the beginning

of the war. Raising debt was not only crucial for governments; it was also an alternative investment for banks in times of falling prices of other securities. Due to the rapid growth of deposits, banks were forced to allocate the capital somewhere else.

Figure 16 and Figure 17 show two key aggregates of the economic policies between 1910 and 1950. Figure 16 displays the evolution of the total government debt in Switzerland and the United Kingdom. British government debt grew enormously during wartime. In 1918, it reached £5.9bn (1914-1918: +732.4%). By 1945, the British debt stood at £22.5bn (1939-1945: +176.7%). Switzerland was not directly involved in either of the two wars through warfare.[314] Nevertheless, government debt grew rapidly during both. From 1914 to 1918, the Swiss government debt rose by 115.4% to CHF 3.9bn. During the Second World War, it increased by 105.7% to CHF 15.4bn. The amount of debt was large in both countries. In the United Kingdom, the Debt/GDP ratio was 235.4% in 1945.[315] The Swiss Debt/GDP ratio had reached 103.9% by the same year.[316]

[314] For the involvement of Swiss banks in the Second World War, see Barbara Bonhage, Marc Perrenoud, and Hanspeter Lussy, *Nachrichtenlose Vermögen bei Schweizer Banken. Depots, Konten und Safes von Opfern des nationalsozialistischen Regimes und Restitutionsprobleme in der Nachkriegszeit.*, ed. by Unabhängige Expertenkommission Schweiz – Zweiter Weltkrieg (UEK) (Zürich: Chronos, 2001), XV. For a broader overview, see Hans Ulrich Jost, *Politik und Wirtschaft im Krieg: die Schweiz 1938-1948* (Zürich: Chronos, 2016).
[315] Bank of England, 'A Millennium of Macroeconomic Data. A30a. Government Debt 1727-2016', 2016 <https://www.bankofengland.co.uk/statistics/research-datasets> [accessed 6 June 2018].
[316] This includes government debt on a federal, Cantonal, and municipal level. Author's calculations. Data: HSSO, 'Historische Statistik der Schweiz Online, Tab. Q.6a.', 2012 <www.hsso.ch/2012/q/6a>. HSSO, 'Historische Statistik der Schweiz Online, Tab. Q.16a.', 2012 <www.hsso.ch/2012/q/16a>. HSSO, 'Historische Statistik der Schweiz Online, Tab. U.45.', 2012 <www.hsso.ch/2012/u/45>.

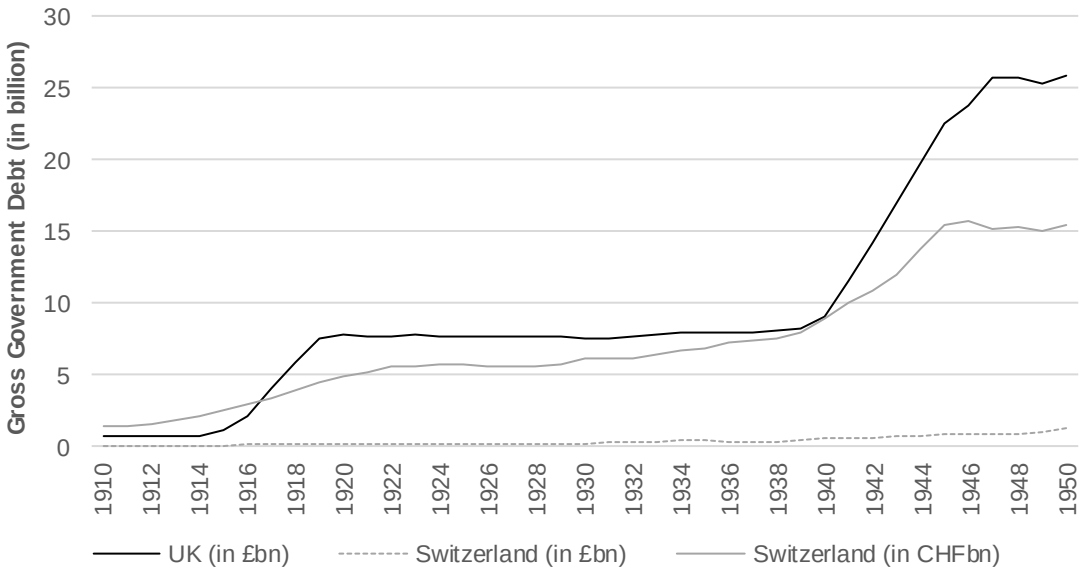

Figure 16: Gross Government Debt in the United Kingdom and Switzerland in £ and CHF Billion, Face Value, 1910-1950[317]

Both countries engaged in an expansionary monetary policy during the two wars. Figure 17 shows the inflation rates of the two countries from 1910 to 1950. The changes in the consumer prices indices have very similar patterns: inflation rates reached their high point in 1917/1918 with around 25%. The First World War was then followed by a deflationary period from 1921 to 1923/1924. The Second World War was marked again by a period of high inflation, albeit on a comparatively lower level. The inflation rates during the Second World War peaked at around 16% in 1940/1941. The similar dynamics of the inflation rates in both the United Kingdom and Switzerland are striking. At the same time, it has to be noted that the large range of the rates from -18% to +25% and their visualisation in the graph contribute to this impression.[318]

[317] Data: United Kingdom: Bank of England, 'A Millennium of Macroeconomic Data. A29. The National Debt', 2016 <https://www.bankofengland.co.uk/statistics/research-datasets> [accessed 6 June 2018]. Switzerland: HSSO, *Historische Statistik der Schweiz Online, Tab. U.45.* The data for Switzerland consists of government debt from all three governmental levels (federal, Cantonal, municipal). Exchange rate data (annual average; for Switzerland in 1936, the average after leaving the gold standard in September 1936 is used, the average GBP/CHF exchange rate changes from 15.3 to 21.3 with the devaluation of the Swiss franc): HSSO, 'Historische Statistik der Schweiz Online, Tab. O.22a.', 2012 <www.hsso.ch/2012/o/22a>.
[318] The correlation of the two time series is 0.9. Mean values: 3.5% (UK), 2.4% (CH).

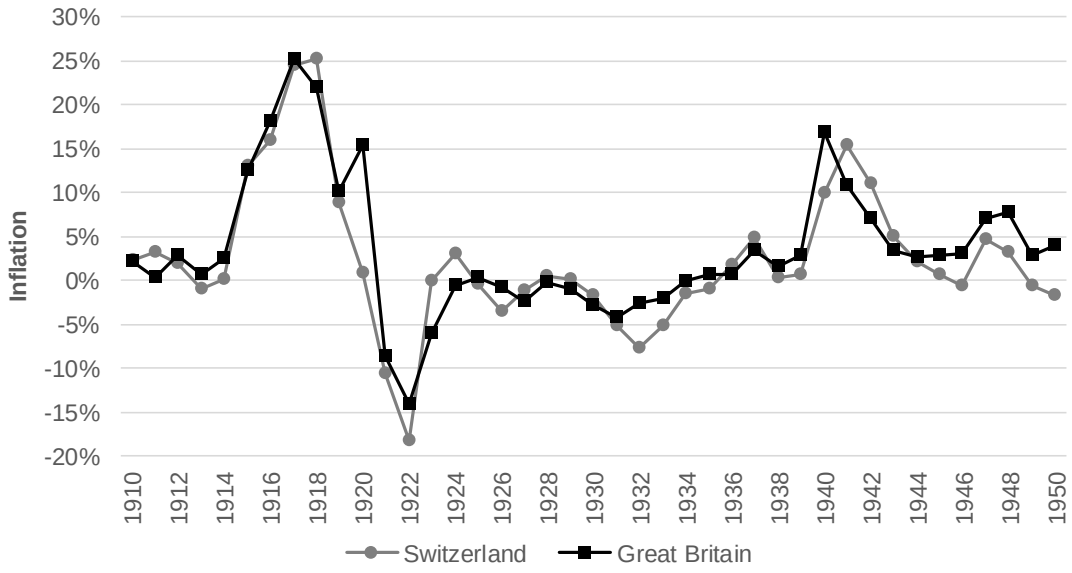

Figure 17: Inflation (Change of Consumer Price Index) in Switzerland and the United Kingdom, 1910-1950[319]

5.1.1. Asset Side: Financing Wars

Banks' contributions to financing governments can be traced by analysing the asset side of balance sheets. Such investments are usually in the form of direct loans to governments or securities, which are part of the investment portfolio of a bank. This section examines the amount of banks' investment in domestic government securities from 1910 to 1950.

Banks as Important Investors in Government Debt

Figure 18 shows the government securities at face value that were held by banks as a percentage of the total gross government debt. For the United Kingdom, the available data allows the analysis of the whole period from 1910 to 1950. Data on Swiss banks and their government investments are only available after 1924.[320] Both the Swiss and the British data sets have various shortcomings. The amount of British treasury bills is based on estimates.[321] In Switzerland, treasury bills ('Schatzanweisungen') and

[319] Data: United Kingdom: Bank of England, 'A Millennium of Macroeconomic Data. A47. Wages and Prices 1209-2016', 2016 <https://www.bankofengland.co.uk/statistics/research-datasets> [accessed 6 June 2018]. Switzerland: HSSO, 'Historische Statistik der Schweiz Online, Tab. H.39.', 2012 <www.hsso.ch/2012/h/39>.
[320] Swiss National Bank, *Die Banken in der Schweiz (annual issues 1906-2015)*.
[321] For the First World War, the amount of treasury bills cannot be found in the statistics of *The Economist* and the *Bankers' Almanac* published at the time. The volume of treasury bills in the

rescriptions ('Reskriptionen') are not included at all due to the lack of available data.[322] Moreover, direct loans to the Swiss Federal government, Cantons, and municipalities are also neglected, even though they were an important funding source.[323]

Nevertheless, Figure 18 serves as a reference point for banks' importance in financing government debt. During the First World War, British banks held up to 29% of the total British government debt. This share dropped substantially in subsequent years. It rose again during the Great Depression and further increased after 1939. The share of government debt held by banks reached about 16% during the Second World War.

In Switzerland, banks were also important lenders to the government during the First World War, even more so as access to foreign capital was limited at the time.[324] Besides the commercial banks, the Swiss National Bank was also a central creditor. It held the most substantial part of the rescriptions during the First World War.[325] The Swiss National Bank therefore directly financed the government, which was not the case to such a large extent anymore by the Second World War. The engagement of Swiss banks in public debt rose sharply in 1941, and by 1944 Swiss banks held about 17% of all government securities.

After the Second World War, the Swiss National Bank for the first time provided a more detailed analysis of government debt in the various banks' balance sheets. It also

balance sheets of British banks from 1910 to 1950 is based on estimates by Sheppard, *The Growth and Role of UK Financial Institutions*, pp. 116–17.

[322] 'Schatzanweisungen' were short-term securities (3-24 months) issued by the Swiss government's treasury department and placed only at banks. Rescriptions were securities issued by the government and financed by the SNB. These securities could then be sold by the SNB to the market and were important during the First and Second World Wars. See also: Patrick Halbeisen and Tobias Straumann, 'Die Wirtschaftspolitik im internationalen Kontext', in *Wirtschaftsgeschichte der Schweiz im 20. Jahrhundert*, ed. by Patrick Halbeisen, Margrit Müller, and Béatrice Veyrassat (Basel: Schwabe Verlag, 2012), pp. 983–1075 (p. 997).

[323] A part of the loans was registered in the debt registry of the federal government. Switzerland's first War Loan, issued in September 1936, for example, was not structured as a bond but based on entries in the debt registry. The use of a debt registry had various advantages compared to an ordinary security. Instead of holding a security, lenders could treat the loan as a receivable and would not need to value the investment in their balance sheet based on a market value. Moreover, the government as a borrower could control who owned its debt (as opposed to ordinary bonds traded on a market). See also: *Bundesgesetz über das eidgenössische Schuldbuch vom 21. September 1939*, 1939.

[324] Mazbouri, Guex, and Lopez, *Finanzplatz Schweiz*, p. 484. For an overview of the role of the banks during the two wars, see also: Malik Mazbouri and Marc Perrenoud, 'Banques suisses et guerres mondiales', in *Kriegswirtschaft und Wirtschaftskriege*, ed. by Valentin Groebner and Sébastien Guex (Zürich: Chronos, 2008), pp. 233–53.

[325] In 1918, CHF 312m of CHF 492m rescriptions were held by the SNB, the rest was placed on the market. Eveline Ruoss, *Die Geldpolitik der Schweizerischen Nationalbank 1907-1929: Grundlagen, Ziele und Instrumente* (Zürich, 1992), p. 92. Hermann Schneebeli, *Die Schweizerische Nationalbank 1907-1932* (Zürich, 1932), p. 469.

included direct loans as well as the treasury bills and rescriptions held by the Swiss banks. If all forms of debt are included, Swiss banks held CHF 3.9bn – about one quarter – of Switzerland's government debt in 1945. This number is clearly higher than that indicated in Figure 18.[326]

Figure 18: Percentage of Gross Government Debt Held by Banks, Switzerland (1924-1950) and United Kingdom (1910-1950)[327]

Government Debt in the Banks' Balance Sheets

What was the effect of government securities on banks' balance sheets? Figure 19 shows the percentage of government securities compared to the total assets for Swiss banks. In 1945, 11.5% (CHF 2.4bn) of the total assets of Swiss banks consisted of

[326] Author's calculations. The total face value of the bonds was CHF 2.4bn. Additionally, the Swiss banks had invested CHF 871m in rescriptions and CHF 606m in direct loans to the federal government, Cantons, and municipalities. The total government debt held by banks in 1945 amounted to CHF 3.87bn. Data: Swiss National Bank, 'Das Schweizerische Bankwesen 1945' (Orell Füssli, 1946), p. 43.
Another important government lender were the life insurance companies, which held 5.4% of the government debt in 1945. They were important for the bond issues of the central government, taking over on average about one sixth of all government bonds. Peter König, 'Der Anteil der Lebensversicherungsgesellschaften an der Finanzierung des Geldbedarfes des Bundes 1939-1945', *Schweizerische Zeitschrift für Volkswirtschaft und Statistik*, 1947, 560–69.
[327] Author's calculations. Data: Bank of England, *A Millennium of Macroeconomic Data. A30a. Government Debt 1727-2016*; Sheppard, *The Growth and Role of UK Financial Institutions*; HSSO, *Historische Statistik der Schweiz Online, Tab. U.45.*; Swiss National Bank, *Die Banken in der Schweiz (annual issues 1906-2015)*.

government bonds. If all other forms of government debt (loans, rescriptions, bills) had been included, the ratio would have been 18.5%.[328]

Figure 19 also displays the share of government securities in the balance sheets of the Big Banks in Switzerland. The data was collected from individual annual reports.[329] The Big Banks held comparatively more government debt on their balance sheets than other banks. If all forms of debt are considered for the Big Banks, 27.0% of the total assets of the Big Banks were invested in the Swiss government in 1945.[330]

However, the role of the Big Banks as vital lenders to the Swiss government during the First World War is not fully captured by the data shown in Figure 19. Treasury bills are neglected as banks did not publish any data on short-term debt. Contemporaries assumed that most of the bills held by banks at the time were invested in treasury bills.[331] If this were true, the actual amount of government debt in balance sheets of the Big Banks would range around 15% during the First World War.

Apart from being lenders to the government, the Big Banks were also involved in the underwriting of the government securities. They formed a cartel together with the Association of Cantonal banks (see also Section 4.2.2). Apart from the first war loan in 1914, the cartel was involved in all the issuances of the government during the First World War. In most cases, the cartel provided a firm commitment of underwriting. Thus, the banks were responsible for the risk of selling Federal and Cantonal bonds and bills to customers or other banks. The total volume underwritten by the cartel between 1914 and 1921 was about CHF 3 billion.[332]

[328] Author's calculations. See footnote 326.
[329] Before 1924, the only source of information is the annual reports of individual banks. Many banks voluntarily published an overview of their investments. Some banks even published the individual titles held by the bank, others published information on an aggregated level, showing the different asset classes. Therefore, the portfolio composition of the group of the eight Big Banks was collected. The eight Big Banks represent about 30% of the Swiss banking market from 1910 to 1923.
[330] Author's calculations. Data: See footnote 326.
[331] Linder, *Die schweizerischen Grossbanken*, pp. 189–99.
[332] Hermann Kurz, *Die schweizerischen Grossbanken: Ihre Geschäftstätigkeit und wirtschaftliche Bedeutung* (Zürich: Orell Füssli, 1928), p. 288.

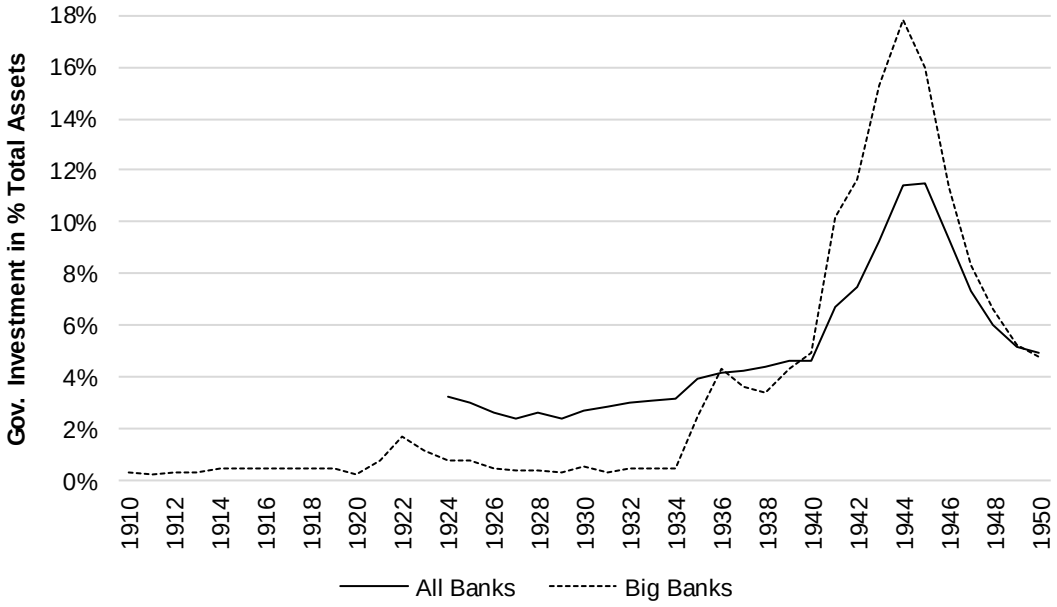

Figure 19: Government Securities as a Percentage of Total Assets, Swiss Banks, 1910-1950[333]

Compared to Swiss banks, the allocation of assets to government securities was higher among British banks (see Figure 20). In 1915, the share of government securities as a percentage of the balance sheet totals was 23.6%. The ratio fell below 20% after the First World War and increased again during the Great Depression. The Second World War led to a considerable increase of the share to 43.0% in 1940 and 62.2% in 1944.

Such comparably high ratios of government debt in balance sheets of British banks are not surprising. The British gross government debt was £22.5bn, Switzerland's debt stood at £0.9bn.[334] The British government debt was about 25 times bigger than that of Switzerland. However, the total assets of Switzerland's banks were comparatively high. The balance sheet total of British banks in 1945 was about five times the balance sheet

[333] Authors' calculations. Data: Swiss National Bank, *Die Banken in der Schweiz (annual issues 1906-2015)*. Big Banks 1910-1924: Data collected by the author from the annual reports of the following banks: Basler Handelsbank, Eidgenössische Bank, Comptoir d'Escompte de Genève, Schweizerische Volksbank, Schweizerische Kreditanstalt, Schweizerische Bankgesellschaft, Schweizerischer Bankverein, Bank Leu.

[334] Data: Bank of England, *A Millennium of Macroeconomic Data. A29. The National Debt*.HSSO, *Historische Statistik der Schweiz Online, Tab. U.45.* HSSO, *Historische Statistik der Schweiz Online, Tab. O.22a.*

total of Swiss banks, even though both its population and Gross Domestic Product were about ten times larger.[335]

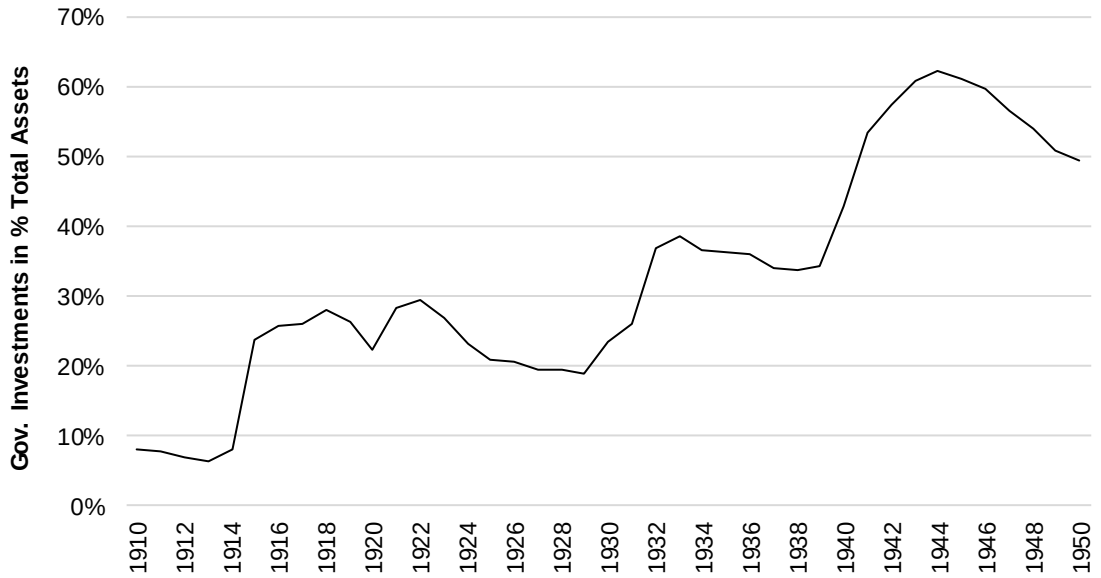

Figure 20: Government Securities as a Percentage of Total Assets, British Banks, 1910-1950[336]

Apart from the high amount of government debt held by banks leading to a balance sheet expansion, price fluctuations of securities can impact capital ratios as well. The most evident example is provided by British Consols at the beginning of the 20th century. Whereas prices for British Consols still ranged around par value at the turn of the century, these prices dropped to 42.75 (2.5%) and 47.25 (2.75%) in 1920.[337] The falling prices led to revaluations of assets in the banks' balance sheets. *The Bankers' Magazine* estimated the write-offs on securities between 1900 and 1918 to be around £37m. If hidden reserves were considered, the amount would likely have been much higher. Even neglecting the use of undisclosed reserves to cover losses, the £37m was a significant figure compared to the paid-up capital and reserves of £127m in 1918. *The Bankers' Magazine* argued that the capital position of British banks would have been much stronger in the absence of these write-offs.[338] Conversely, it also has to be mentioned

[335] Bank of England, 'A Millennium of Macroeconomic Data.', 2016, secs A9 & A18 <https://www.bankofengland.co.uk/statistics/research-datasets> [accessed 6 June 2018]; HSSO, 'Historische Statistik der Schweiz Online, Tab. B30.', 2012 <www.hsso.ch/2012/b/30>.
[336] Author's calculations. Data: Sheppard, *The Growth and Role of UK Financial Institutions*.
[337] Bank of England, 'A Millennium of Macroeconomic Data. A30b. National Debt Market Values', 2016 <https://www.bankofengland.co.uk/statistics/research-datasets> [accessed 6 June 2018].
[338] The Bankers' Magazine, 'The Progress of Banking in Great Britain and Ireland During 1918. Capital and Reserve Funds', 1919, 1–15 (pp. 4–6).

that prices of British securities increased in the years after the war, leading to substantial hidden reserves. *The Economist* commented in 1923 that until then, no bank had again written up their investments in the public accounts.[339]

The high ratios of government investments in both banking systems show that banks were highly relevant lenders to the government. It raises the question of how these ratios could be increased to such an extent. From an accounting perspective, there are two ways: firstly, it could have been done through a reallocation of assets. In that case, banks would have divested some assets and increased their exposure in government investments. Secondly, the total assets could have increased. In turn, this would have also required an increase on the liabilities side.

In both banking systems, one of the largest balance sheet items on the asset side for the period 1910 to 1950 were amounts due from customers. In the United Kingdom, this consisted of loans, advances, and other accounts.[340] Government securities surpassed the amount of loans, advances, and other accounts only after 1940. In Switzerland, amounts due from customers were loans, which were to a large extent covered by mortgages. In both countries, a large-scale reallocation of assets from loans to government securities did not take place. In wartime, the amounts due from customers usually increased, which supported the supply of capital for the war economy. There was only one exception. In the United Kingdom, loans, advances, and other accounts shrank by 18.6% from 1939 to 1945. In terms of volume, however, 18.6% represented only a reduction of £184.8m. At the same time, government securities grew by £2.2bn. Therefore, the reallocation effect coming from the shift from one asset (loans) to another (government securities) was minimal.

Within the short-term assets, however, there were some reallocation effects. In Switzerland, there was a rapid decline of investments in foreign commercial papers. This part was rapidly taken over by treasury bills during the First World War.[341] Similar effects were observed in London, where the declining share of the commercial papers and the

[339] 'The Economist Banking Supplement 1923', pp. 1059–60.
[340] For an overview of bank lending from 1860 to 1913, see: Michael Collins and Mae Baker, *Commercial Banks and Industrial Finance in England and Wales, 1860-1913* (Oxford ; New York: Oxford University Press, 2003).
[341] Swiss National Bank, 'Das Schweizerische Bankwesen 1916' (Buchdruckerei Stämpfli & Cie, 1918), p. 6.

drop of investments in foreign credit were rapidly replaced by treasury bills in both World Wars.[342]

Overall, the percentage of government debt in the balance sheets of banks grew substantially. In the United Kingdom, the government securities grew on average by 53.8% per year during the First World War and by 22.9% per year during the Second World War. In Switzerland, the average annual growth during the Second World War was 16.9% (see Table 9). For both countries, it can be stated that the large-scale investments in government debt were an essential driver of the growth of the total assets. But how was this expansion on the asset side funded on the liabilities side?

5.1.2. Liabilities Side: Deposits, Capital Issuances, and Effects of Inflation

Amounts due from customers in the form of loans were the largest balance sheet item on the asset side in both banking systems for most of the time from 1910 to 1950. On the liabilities side, customers' deposits (due to customers) were the most relevant funding source. In the United Kingdom, deposits contributed on average almost 90% of the balance sheet total from 1910 to 1950. In Switzerland, about three-thirds of the total liabilities came from customers. The differences may very well arise from statistical differences. The respective data covering Switzerland is more detailed than that for the United Kingdom. Funds due to banks, for example, are not shown separately in British statistics. Despite the lack of granularity in the British data, it is clear that funds from customers were the largest balance sheet item on the liability side.

The Growth of Deposits

Table 9 shows the changes both in volumes and percentage of the amounts due to customers, the total of domestic government securities (in the bank balance sheets), and the total assets during the two World Wars. In both countries, the customers' deposits grew substantially during the two wars and outpaced the growth of the balance sheet total. In terms of volume, the deposits grew more than the total of government securities. In the United Kingdom, for example, government securities held by banks grew by £391m during the First World War and £2.3bn during the Second World War. The deposits increased by £774m and £2.5bn respectively. Similarly, the amount of

[342] 'Banking Supplement 1940', *The Economist* (London, 18 May 1940), p. 4.

government securities held by Swiss banks grew by CHF 1.6bn during the Second World War, which was lower than the increase of CHF 2.5bn in customers' deposits.

To sum up, deposits grew faster than assets. The high share of deposits on the liabilities side indicates that deposits were the main driver of the balance sheet expansion during the two wars.

		Change in	1914-1918	1939-1945
	Due to Customers (Liability)	% (p.a.)	14.4%	11.3%
		£m	774	2,543
	Government Securities (Asset)	% (p.a.)	53.8%	22.9%
		£m	391	2,293
		% (p.a.)	13.3%	10.8%
United Kingdom	**Total Assets**	£m	782	2,547
	Due to Customers (Liability)	% (p.a.)	7.0%	2.4%
		CHFm	2,554	2,537
	Government Securities (Asset)	% (p.a.)	n/a	16.9%
		CHFm	n/a	1,585
		% (p.a.)	5.9%	1.9%
Switzerland	**Total Assets**	CHFm	3,116	2,631

Table 9: Changes in Percent (Nominal Changes) and Volume (in Million Domestic Currency) of Amounts Due to Customers, Domestic Government Securities, and Total Assets, United Kingdom and Switzerland, 1914-1918 and 1939-1945[343]

Why did customers' deposits grow to such a large extent during the two wars? The high inflation rates during wartime shown in Figure 17 substantially depreciated the value of money. Banks mostly deal with nominal financial instruments. Exceptions on the asset side are, for example, direct holdings of bank premises or real estate. The payments related to nominal financial instruments are fixed in nominal amounts. An increase in the expected inflation raises nominal interest rates, which translates into a change in the nominal value of a financial instrument.[344] Therefore, nominal balance sheet items adjust to inflation.

One of the drivers of inflation during the wars was the velocity of money. These effects were already understood and described during the First World War. *The Economist* outlined the driving forces behind the deposit growth in 1916, namely four processes that can contribute to the increase of deposits: first, deposits grow if the country's stock of

[343] Data: Sheppard, *The Growth and Role of UK Financial Institutions*. Swiss National Bank, *Die Banken in der Schweiz (annual issues 1906-2015)*.
[344] Irving Fisher, *The Theory of Interest: As Determined by Impatience to Spend Income and Opportunity to Invest It* (New York: Macmillan, 1930).

gold is increasing and the gold is brought to the banks. This increases the cash on the asset side and deposits on the liabilities side. Second, deposits grow if the stock of paper currency is increased and the currency is paid in. Third, banks can create money by giving discounts, loans, and advances, which then creates deposits. The fourth and last channel runs from banks buying securities to deposit growth. As banks invested in government securities, cash was transferred from the Bank of England to the government. British banks, therefore, held securities instead of cash. The government drew on the balance at the Bank of England and invested this capital in the economy. The companies that had received capital were depositing it into their accounts, which was increasing the volume of deposits.[345] *The Economist* heavily criticised the expansionary monetary policy of the government and the Bank of England and argued that private individuals would have to start investing in government securities more substantially to reduce inflation.[346] The role of inflation as a driver of deposits' growth during the two wars was also discussed in Switzerland.[347]

Besides inflation, various other reasons that were also frequently mentioned in the context of growing deposits. Both in the United Kingdom and Switzerland, it was argued that the public had a 'liquidity preference' during the two World Wars. In times of uncertainty and depressed securities prices, bank customers shifted their long-term investments into deposits, making their wealth more readily available.[348] Other domestic effects, such as the liquidation of inventories at the beginning of the wars, might have impacted the growth of deposits as well.[349]

Another relevant driver of deposits' growth in Switzerland was foreign capital inflows. The Swiss National Bank mentioned the stream of capital from abroad many times in its annual statistical publications during both the First and Second World Wars. Whereas capital inflows were directly referred to as 'tax flight capital' during the First World War, such specific remarks were not made in later years.[350] The Swiss National Bank simply

[345] For an overview of drivers of deposit growth during the First World War, see also: E. Victor Morgan, *Studies in British Financial Policy, 1914-25* (London: Macmillan, 1952), p. 242.
[346] 'Banking Supplement 1916', *The Economist* (London, 21 October 1916), pp. 701–2. 'Banking Supplement 1945', *The Economist* (London, 29 December 1945), p. 2.
[347] Jöhr, *Schweizerische Kreditanstalt*, p. 238. Swiss National Bank, 'Das Schweizerische Bankwesen 1917' (Buchdruckerei Stämpfli & Cie, 1919), p. 5. Swiss National Bank, 'Das Schweizerische Bankwesen 1942' (Orell Füssli, 1943), p. 11.
[348] 'The Economist Banking Supplement 1941', p. 5. Swiss National Bank, 'Das Schweizerische Bankwesen 1918' (Buchdruckerei Stämpfli & Cie, 1920), p. 4.
[349] Swiss National Bank, *Das Schweizerische Bankwesen 1918*, p. 3; Swiss National Bank, *Das Schweizerische Bankwesen 1942*, p. 11.
[350] Swiss National Bank, *Das Schweizerische Bankwesen 1918*, p. 4.

referred to it as foreign capital inflows.[351] There are no figures available that provide insights into the volume of foreign deposits during the two wars, even though for example the 'Independent Commission of Experts Switzerland' attempted to make such estimates when examining Switzerland's role during the Second World War.[352] Switzerland was a stable financial hub in the turmoil of war, which was the basis for large financial transactions. The Swiss franc was a stable currency and the only currency in Europe which was almost freely convertible. Indeed, Swiss banks also participated in purchases of Nazi gold and provided credit to Germany, Italy, and the Allies. Moreover, banking secrecy – codified in the Banking Act of 1934, but already rooted in the Swiss banking sector since the end of the 19th century – certainly also attracted foreign funds.[353]

Stagnating Equity Capital

Changes in two components can lead to a rise of the equity capital. Fresh shares might be issued, or reserves increased. Figure 21 and Figure 22 show the paid-up capital and the reserves of Swiss banks and British joint-stock banks.

In the early years of the First World War, Swiss banks were hesitant with new capital issuances. There were almost no recapitalisations from summer 1914 to 1916. The capital increases shown in Figure 21 are mostly related to banks that were newly included in the SNB statistics. It was only in 1916 that a larger amount of capital was issued (CHF 25m). The reasons mentioned for these issuances were the positive development of the economy after 1916 as well as growing deposits.[354] This, however, had little effect on the capital/assets ratio.

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[351] Swiss National Bank, 'Das Schweizerische Bankwesen 1940' (Orell Füssli, 1941), p. 8.

[352] The *Independent Commission of Experts Switzerland* analysed Switzerland's role during the Second World War. One part of the investigation focused on foreign capital at Swiss banks in the form of deposits, securities accounts, and safes that have not been claimed by someone after the war. The availability of the sources, however, did not allow the authors to make an estimate about the volume of these assets. Bonhage, Perrenoud, and Lussy, XV, *Nachrichtenlose Vermögen bei Schweizer Banken. Depots, Konten und Safes von Opfern des nationalsozialistischen Regimes und Restitutionsprobleme in der Nachkriegszeit.*
For a more broader analysis of assets under management, see: Christophe Farquet, *Histoire du paradis fiscal suisse* (Paris: SciencesPo les presses, 2018).

[353] Sébastien Guex, 'The Origins of the Swiss Banking Secrecy Law and Its Repercussions for Swiss Federal Policy', *Business History Review*, 2000, 237; Robert Vogler, 'The Genesis of Swiss Banking Secrecy: Political and Economic Environment', *Financial History Review*, 8.1 (2001), 73–84.

[354] Swiss National Bank, *Das Schweizerische Bankwesen 1916*, p. 2. For an overview of Switzerland's monetary policies during the First World War, see: Ruoss, *Die Geldpolitik der Schweizerischen Nationalbank 1907-1929*. Sébastien Guex, *La politique monétaire et financière de la Confédération suisse: 1900-1920* (Lausanne: Payot, 1993). For an overview of monetary policy during the First and Second World Wars, see: Michael Bordo and Harold James, 'Die

The first years of the Second World War in Switzerland are comparable to the period of 1914 to 1916 in terms of the absence of capital issuances. Only two Cantonal banks issued fresh capital in 1941.[355] The Big Banks did not issue capital at all during the war. There were no formal constraints with regards to capital issuances during both wars. Especially during the Second World War, however, there was a widespread conception that banks should not lock up capital that could be otherwise used for sovereign debt. As an observer at the time put it: 'Issuing capital during the war forbade itself'.[356]

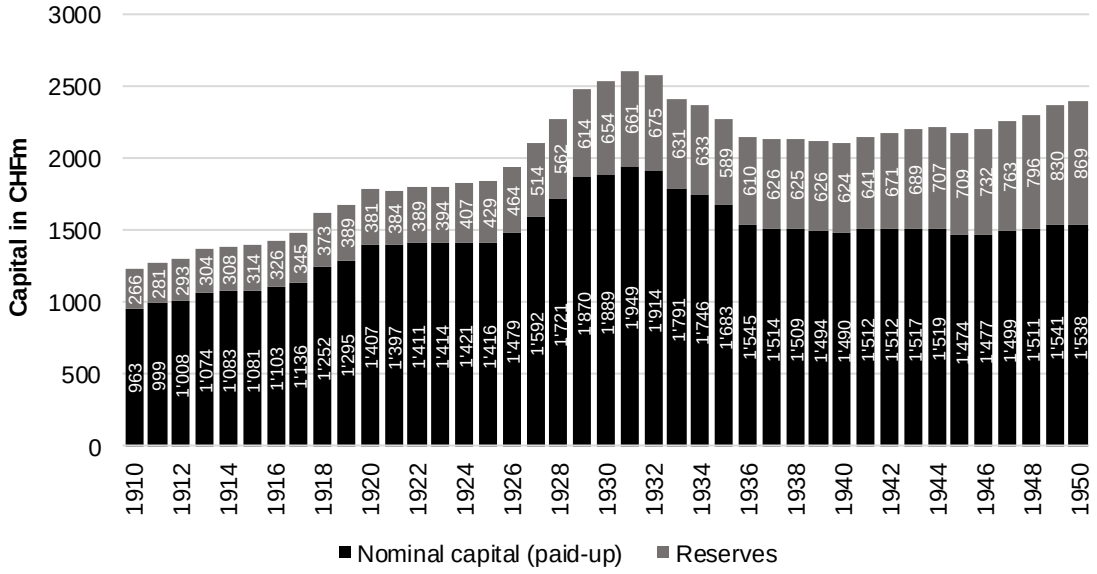

Figure 21: Nominal Capital (Paid-up) and Reserves in CHF Millions, Swiss Banks, 1910-1950[357]

Whereas almost no capital was issued in Switzerland during wartime due to informal constraints, the same happened in the United Kingdom due to formal restrictions. During the First World War, capital issuances had to be approved by the Treasury. In January 1915, the Treasury announced that 'in the present crisis all other considerations must be subordinated to the paramount necessity of husbanding the financial resources of the country with a view to the successful prosecution of the war' and that 'it feels it imperative

Nationalbank 1907–1946: Glückliche Kindheit oder schwierige Jugend?', in *Schweizerische Nationalbank, 1907-2007*, ed. by Schweizerische Nationalbank SNB (Zürich: Verlag Neue Zürcher Zeitung, 2007), pp. 29–118. Tobias Straumann, *Fixed Ideas of Money: Small States and Exchange Rate Regimes in Twentieth Century Europe*, Studies in Macroeconomic History (Cambridge: Cambridge University Press, 2010).

[355] The Cantonal banks from Luzern and Graubünden raised additional capital in 1941.

[356] Jöhr, *Schweizerische Kreditanstalt*, p. 476.

[357] Swiss National Bank, *Die Banken in der Schweiz (annual issues 1906-2015)*.

in the national interest that fresh issues of capital shall be approved by the Treasury before they are made.'[358]

The control of capital issuances was only one dimension of wartime control of financial resources. The export of capital was also severely restricted.[359] The Treasury's embargo had a substantial impact on the British financial market. In 1914, £512.6m were issued in the United Kingdom, of which £180.1m were not for the government. In 1916, £585.6m were issued, with only £31.5m left for non-government issuances. The figures diverged even more in 1917, with total issues of £1.3bn – of which all but £40.9m were government securities.[360] After the war, the government attempted to maintain this capital control policy. However, eventually, a less restrictive regulation was introduced, only forbidding capital issuances that could contribute to foreign capital purposes.[361] Thus, the government withdrew the domestic ban on capital issuances in March 1919.[362]

During the Second World War, the British government again controlled private capital operations. Based on a Treasury Memorandum of Guidance that was issued on 12 September 1939, capital issuances were to be restricted to production and services related to defence, essential services (such as transports, food supplies) and export purposes.[363] Moreover, banks were asked by the Bank of England to focus their lending on defence production, exports, coal-mining, and agriculture. After the war, in May 1945, new capital issuances were allowed again, but only for reconstruction purposes.[364]

Figure 22 shows the paid-up capital and reserves of British banks from 1910 to 1950. During these four decades, there was only one major increase of capital, in 1919 and 1920.

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[358] 'Passing Events', *The Investors' Review* (London, 23 January 1915), XXXV, No. 890 edition, p. 76.
[359] Henry Francis Grady, *British War Finance: 1914-1919* (New York: Columbia University Press, 1927), pp. 59–61.
[360] Richard Sidney Sayers, *The Bank of England 1891-1944* (Cambridge: Cambridge University Press, 1976), pp. 79–83.
[361] Regulation 30F. Grady, *British War Finance*, p. 63.
[362] Susan Howson, *Domestic Monetary Management in Britain: 1919-38*, Occasional Paper / University of Cambridge, Department of Applied Economics (Cambridge: Cambridge University Press, 1975), p. 10. For an overview of British monetary and financial policy during the First World War, see also: Morgan, *Studies in British Financial Policy, 1914-25*.
[363] Richard Sidney Sayers, *Financial Policy, 1939-45* (London: Her Majesty's Stationery Office, 1956), p. 165.
[364] Susan Howson, *British Monetary Policy 1945-51* (Oxford: Clarendon Press, 1993), p. 38.

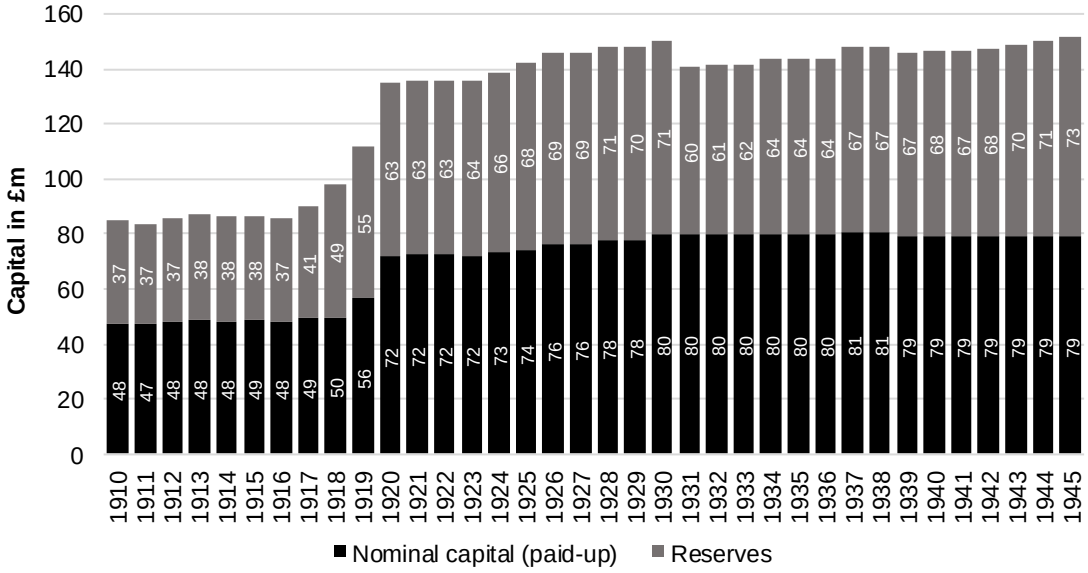

Figure 22: Nominal Capital (Paid-up) and Reserves in £ Millions, British Banks, 1910-1945[365]

[365] Author's calculations, the Bank of England was excluded. Data: 'The Economist Banking Supplement, Various, 1861-1946'.

5.2. Many Good Reasons for Increasing or Not Increasing Capital

Many of the balance sheet characteristics that had contributed to the declining capital ratios of banks during the two World Wars were similar for the United Kingdom and Switzerland. Did this also apply to the discussions in the two countries about capital adequacy? And did banks aim to reinstall pre-war capital ratios once the wars were over? The following section discusses the post-war situation in each country and reflects on the various reasons as to why banks did or did not issue new capital after the wars.

5.2.1. Switzerland After the First World War: Back to Normal?

The war years were a period of extraordinary conditions, which left their mark on banks' balance sheets. Many contemporaries expressed the argument that balance sheets – and with them capital ratios – would return to 'normal' in peacetime. On a broader level, there was also the idea of returning to the pre-war economic system, most prominently represented by the Gold Standard.[366] A normalisation in the banking sector meant that government debt and deposits would contract again. However, a transition to pre-war balance sheets and to a pre-war macroeconomic environment did not happen after either of the two wars. An economic depression followed the First World War in both countries. After the Second World War, Great Britain first dealt with reconstructing and reorganising the economy, whereas Switzerland rapidly entered a period of growth.

In Switzerland, banks engaged in sizeable capital issuances after the First World War because they wanted to return to pre-war capital ratios. The motives for capital issuances in Britain were different. 1918 marked the end of the amalgamation period in British banking. Capital adequacy became a topic, but it was mostly discussed in the context of the amalgamations that had contributed to falling capital ratios (see Section 5.2.3).

The view of the Swiss National Bank in 1918 is representative of the idea in Switzerland of returning to pre-war conditions:

[366] See for example: Barry Eichengreen, *Globalizing Capital: A History of the International Monetary System* (Princeton, New Jersey: Princeton University Press, 1998), pp. 57–62.

> It is to be expected that considerable sums of deposits will be taken out of the banks for other purposes after the peace agreement. The [capital/liability] ratios should, therefore, perhaps improve again by themselves over time.[367]

Similarly, contemporaries referred to the abnormally inflated balance sheets of banks as a result of the war economy.[368] Moreover, two of the Big Banks, Credit Suisse and the Swiss Bank Corporation, commented in their annual reports of 1917 that their large total assets and deposits were only a temporary phenomenon and would soon be shrinking again.[369]

Once the war was over, it became clear that macroeconomic conditions would not normalise immediately. The post-war economic depression reached its high point in Switzerland in 1922 with high deflation and high unemployment rates. Moreover, asset prices had been falling and capital markets were not able to absorb large capital issuances at the time, which restricted Swiss banks' capacity to refinance through capital issuances.[370]

On an international level, the monetary disorders after the war had consequences for the Swiss financial centre, as it experienced large-scale capital inflows. Against expectations, the balance sheet totals and deposits of Swiss banks did not fall after the First World War. Total assets grew by 6.6% between 1918 and 1922 (1.6% p.a.). Deposits even increased by 15.6% (3.4% p.a.). This growth reinforced the belief among the Swiss banking sector that capital issuances could not be postponed any further, given 'the unfavourable capital/liability ratio', as concluded by the Swiss National Bank.[371] Moreover, the Swiss National Bank noted that 'the uncertain outcome of the current depression and the need to counter it as a precaution really cannot be stressed enough.'[372]

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[367] Swiss National Bank, *Das Schweizerische Bankwesen 1917*, p. 8.
[368] Werner Hügi, *Ökonomische Eigenarten im schweizerischen Bankgewerbe* (Bern: P. Haupt, 1927), p. 85.
[369] Kurz, *Die schweizerischen Grossbanken*, p. 25. Schweizerischer Bankverein, *Jahresbericht Schweizerischer Bankverein 1918* (Basel, 1919), p. 26.
[370] Husy, *Die eigenen Mittel*, p. 57.
[371] Swiss National Bank, 'Das Schweizerische Bankwesen 1920' (Art. Institut Orell Füssli, Zürich, 1921), p. 15.
[372] Swiss National Bank, *Das Schweizerische Bankwesen 1920*, p. 15.

The Swiss banks started issuing capital once they realised that their balance sheets would not contract but grow – mostly due to foreign capital inflows.[373] Between 1918 and 1922, Swiss banks increased their paid-up capital substantially, by CHF 389.3m (+20%). The capital was increased despite difficult economic conditions, and even though distressed prices at capital markets led to very low share premia. In addition to the nominal capital raised, only CHF 13.3m could be added to the reserves as premia.[374]

Even though capital increases after the First World War were substantial in absolute terms, they had only small effects on the capital/assets ratios. The average capital/assets ratio of all Swiss banks grew from 13.1% in 1918 to 13.6% in 1922. For the Big Banks, the impact was more substantial. Their ratio increased from 14.8% to 17.5%. However, it was only a short-term recovery for capital levels. The rapid growth of deposits as a key component of liabilities also continued in later years. From 1922 to 1929, the deposits of Swiss banks grew on average by 6.6% per year. The deposits of the Big Banks even increased by an average of 10.5% p.a. Foreign capital inflows were a substantial driver of this growth.

There are no exact figures for the volume of foreign deposits transferred to Switzerland during and after the First World War. Contemporaries estimated that about half of the deposits flowing to the Swiss Banks in 1929 were transferred from abroad (about CHF 440m).[375] Gottlieb Bachmann, Head of Department I of the Swiss National Bank from 1925-1939, estimated the total volume of foreign funds by the end of 1929 to be from around CHF 1 to CHF 1.3 billion.[376] Domestic and foreign deposits in Swiss banks

[373] Jöhr, *Schweizerische Kreditanstalt*, p. 279. Linder, *Die schweizerischen Grossbanken*, p. 203. Herbert Raff, *Schweizerische Bankgesellschaft: 1862, 1912, 1962* (Zürich: Schweizerische Bankgesellschaft, 1962), p. 96.
[374] Author's calculations. Data: Swiss National Bank, *Das Schweizerische Bankwesen 1918*, p. 34; Swiss National Bank, 'Das Schweizerische Bankwesen 1919' (Buchdruckerei Stämpfli & Cie, 1921), p. 40; Swiss National Bank, *Das Schweizerische Bankwesen 1920*, p. 87. Swiss National Bank, 'Das Schweizerische Bankwesen 1921' (Art. Institut Orell Füssli, Zürich, 1923), p. 69. Swiss National Bank, 'Das Schweizerische Bankwesen 1922' (Art. Institut Orell Füssli, Zürich, 1924), p. 65.
[375] Rudolf Erb, *Die Stellungnahme der schweizerischen Grossbanken zu den bank- und währungspolitischen Problemen der Kriegs- und Nachkriegszeit* (Zürich: A.-G. Gebr. Leemann & Co, 1931), p. 15.
[376] Bernard Worner, *La Suisse, centre financier européen* (Argenton: Impr. de Langlois, 1931), p. 101.
For an overview of sources discussing foreign capital inflows during and after the First World War, as well as the foreign investments of the Swiss banks, see: Mazbouri, Guex, and Lopez, *Finanzplatz Schweiz*, pp. 484–86. and Yves Sancey, *Quand les banquiers font la loi: aux sources de l'autorégulation bancaire en Suisse et en Angleterre, de 1914 aux années 1950*, Histoire et société contemporaines (Lausanne: Ed. Antipodes, 2015), pp. 371–410.
For estimates about tax flight from Germany after the First World War, see: Christophe Farquet,

reached a volume of CHF 9.4bn in 1929.[377] Foreign capital inflows led to a further increase in the total assets, which in turn contributed to the deterioration of the capital/assets ratio. In 1929, the capital/assets ratio of all Swiss banks was 12.1%, while the ratio of the Big Banks fell to 14.0%.

Compared to the period before the First World War, these ratios were substantially lower. The perception of 'adequate capital' had changed substantially. Before the war, a capital/liability ratio of about 30% (c/a ratio = 23%) was considered adequate for the Big Banks (see also Section 4.2.2).[378] After the First World War, contemporaries viewed a capital/liability ratio of about 20% as the new standard for the Big Banks.[379] The standard ratio for banks focusing on savings and mortgages was in between 9% and 10%.[380] The Swiss National Bank was not worried about these new conventions, highlighting that the reserves had increased substantially since the end of the war and that the Swiss banks held more liquid assets, which would require less capital.[381]

5.2.2. Switzerland After the Second World War: The Importance of Formal Capital Requirements

The early 1950s mark the end of two conventions that had directed the capital policies of Swiss banks for a long time. Firstly, the group of the Big Banks no longer had the highest capital ratio of all the banking groups in Switzerland.[382] Traditionally, the argument had been that the Big Banks conducted a comparatively (to other banks) riskier business and therefore required more capital. However, with high shares of government papers in their balance sheets and sharply increasing amounts of deposits during and after the war, the business model of the Big Banks had changed. Moreover, the

'Quantification and Revolution: An Investigation of German Capital Flight after the First World War', *EHES Working Paper*, 2019.

[377] Switzerland was also the fourth largest creditor behind the UK, France, and the Netherlands in the period from 1924 to 1930. Katherine Watson and Charles H. Feinstein, 'Private International Capital Flows in Europe in the Inter-War', in *Banking, Currency, and Finance in Europe Between the Wars*, ed. by Charles H. Feinstein (Oxford: Oxford University Press, 1995), pp. 94–130 (p. 116).

[378] Swiss National Bank, *Das Schweizerische Bankwesen 1920*, p. 32.

[379] Erb, *Stellungnahme der schweizerischen Grossbanken*, p. 79. Schweizerische Volksbank, *Denkschrift der Schweizerischen Volksbank*, p. 59.

[380] Ernst Wetter, *Bankkrisen und Bankkatastrophen der letzten Jahre in der Schweiz* (Zürich: Orell Füssli, 1918), p. 207. Such capital levels were also considered as adequate for German mortgage banks. See: von Bissing Wolfgang Moritz Freiherr, 'Die Schrumpfung des Kapitals und seine Surrogate', in *Untersuchung des Bankwesens 1933 I. Teil*, ed. by Untersuchungsausschuß für das Bankwesen 1933 (Berlin: Heymanns, 1933), p. 77.

[381] Swiss National Bank, *Das Schweizerische Bankwesen 1920*, p. 32.

[382] Swiss National Bank, 'Das Schweizerische Bankwesen 1951' (Orell Füssli, 1952), p. 17.

importance of direct industrial investments decreased. Secondly, and certainly related to that, the rules of thumb that had been used as a reference for capital adequacy were abandoned. Before the First World War, the Big Banks had frequently issued new capital in order to maintain a certain capital ratio. After the First World War, a capital/liability ratio of about 20% for Big Banks was accepted by the Swiss National Bank. In 1945, the capital/assets ratio of the Big Banks was 11.0%; it had dropped by 4.4 percentage points during the war. The combined capital/assets ratio of all banks stood at 10.5%.

After the Second World War, the idea of returning to pre-war capital levels did not exist. In contrast to the aftermath of the First World War, the economic conditions were fundamentally different. Switzerland was in an economic upswing and the balance sheets of the Swiss banks grew rapidly. Between 1945 and 1950, the average annual growth rate of the balance sheet totals was 5.5%, while the economy grew on average by 8.0% p.a.[383] Despite these economically favourable conditions, there were very few capital issuances in the post-war years. Between 1945 and 1950, Swiss banks issued new nominal capital of only about CHF 110m (7% of the paid-up capital). The two largest Big Banks at the time – the Swiss Bank Corporation and Credit Suisse – did not increase their nominal capital in the first years after the war at all.[384] Why did banks not consider a return to pre-war capital levels? The following paragraphs will review three arguments. First of all, the legacies of the Great Depression are discussed. Secondly, the role of hidden reserves is highlighted. Thirdly, the effects of the new regulation replacing existing conventions are emphasised.

The Second World War brought the period of restructuring and consolidation among the Big Banks to a halt. This process, which also affected the capital structure of the banks, had been triggered by the Great Depression. Once the war was over, one of the first items on the agenda of the banks was to deal with the legacies of the 1930s.

The Swiss Volksbank had to be rescued by the Federal government in 1933.[385] The government held 50% of the Volksbank's capital. Not long into the war, however, the bank considered its capital to be too high and aimed to pay back the capital of the government. However, the Volksbank postponed the transaction until after the war.[386]

[383] Data on GDP growth: HSSO, *Historische Statistik der Schweiz Online, Tab. Q.6a.*; HSSO, *Historische Statistik der Schweiz Online, Tab. Q.16a.*
[384] Swiss National Bank, *Das Schweizerische Bankwesen 1951*, p. 17.
[385] Baumann, *Bundesinterventionen in der Bankenkrise 1931-1937*.
[386] Ernst Schneider, *Die schweizerischen Grossbanken im zweiten Weltkrieg 1939-1945* (Zürich: Brunner & Bodmer, 1951), p. 101.

The Volksbank's primary goal after the war was to become independent again and to start reducing the Swiss government's capital share, which happened between 1947 and 1949.[387] By 1945, the bank's capital/assets ratio was 10.5%. In 1950, the ratio was 7.6%.[388] Being the outcome of a long-planned capital reorganisation, it can be assumed that the management of Volksbank perceived a capital/assets ratio of roughly 7% to 8% as adequate.

Another bank from the group of Big Banks, Bank Leu & Co., had to be restructured in 1936 and again after the war. The bank reduced its capital and re-issued new shares in 1945. The increase of the capital was related to the write-down of foreign investments made before the war. Two other banks, the Basler Handelsbank and the Eidgenössische Bank, were also heavily invested in German loans and securities during the 1930s and never fully recovered from their losses. The Basler Handelsbank was taken over by the Swiss Bank Corporation in 1945.[389] The Eidgenössische Bank was taken over by the Union Bank of Switzerland in the same year. UBS increased its nominal capital for that purpose by CHF 10m to CHF 50m.[390] Nevertheless, the capital/assets ratio of the Union Bank of Switzerland fell to 7.1% in 1950, the ratio of the Swiss Bank Corporation to 7.6%.

Another legacy of the Great Depression and the war years was the low dividends for shareholders. Traditionally, Swiss banks aimed for stable dividends. The target dividend was usually met by augmenting or releasing internal or published reserves.[391] A case in point is Credit Suisse, which paid a dividend of 8% from 1895 to 1933.[392] The 'traditional 8%' became a benchmark for the Big Banks. Besides Credit Suisse, Bank Leu & Co., the Swiss Bank Corporation, the Eidgenössiche Bank, and the Basler Handelsbank all paid a dividend of 8% in 1930. The Union Bank of Switzerland paid 7% and the Swiss Volksbank 5%.[393] The losses of the 1930s forced banks to cut their dividends to between 0% and 5% (1935). A sharp reduction in foreign business in 1939 led banks to lower

[387] Neue Zürcher Zeitung, 'Schweizerische Volksbank, Delegiertenversammlung' (Zürich, 24 February 1947), section Handelsteil, p. 3. The *Neue Zürcher Zeitung* also noted that: 'During the uncertain war years, the Volksbank attached great importance to maintaining its comparably high equity capital.'
[388] Author's calculations, based on annual reports.
[389] Schneider, *Die schweizerischen Grossbanken im zweiten Weltkrieg 1939-1945*, p. 103.
[390] Swiss National Bank, *Das Schweizerische Bankwesen 1945*, p. 13.
[391] Linder, *Die schweizerischen Grossbanken*, pp. 132–33. Schneider, *Die schweizerischen Grossbanken im zweiten Weltkrieg 1939-1945*, p. 108.
[392] Jöhr, *Schweizerische Kreditanstalt*, p. 270.
[393] See annual reports for dividend data.

dividends even further, on average by another 1%.[394] It was not until 1952 that Credit Suisse and the Swiss Bank Corporation reached the 8% level again. The Union Bank paid 8% from 1956 onwards, and the Swiss Volksbank paid 8% only after 1960.

Given the low dividends after the war, it seems that the banks either opted in favour of their shareholders' interest or thought that they could not place enough shares in the market given the low dividends. Instead of issuing shares, the banks increased dividends first. This process would have certainly been more difficult, if not impossible, the other way around.

Another factor reducing the need for immediate capital issuances after the war was the growing hidden reserves, through which the actual capital of the banks also grew. The extent of the hidden reserves after the war is unknown. It is likely that the Great Depression diminished most of the hidden reserves since only two of the Big Banks – Credit Suisse and the Swiss Bank Corporation – managed to get through the crisis without being forced to reduce their nominal capital. Many other banks used most of their hidden reserves and large parts of their published reserves.[395] As asset prices increased after the war, hidden reserves started to accumulate substantially.[396] The actual capital rose with the increase of the hidden reserves. This build-up of hidden reserves cannot be detected in published accounts, but certainly strengthened the solvency of the banks. Estimates for hidden reserves in the Swiss banking system for the period 1961 to 1994 are shown in Section 3.4.2.

Bank capital was first regulated on a national level in Switzerland in 1934/1935 with the Banking Law and the Banking Ordinance. According to the Banking Law, a bank's capital would have to be in an 'appropriate' proportion to its liabilities.[397] The Banking Ordinance further specified minimum capital requirements (see Section 6.2.1. for a detailed overview of the legal framework).[398]

The introduction of written rules certainly contributed to the demise of informal conventions on what amount of capital was perceived as adequate. The optimal amount

[394] Rudolf Speich, *75 Jahre Schweizerischer Bankverein: 1872-1947. Vergangenheit und Gegenwart: Ansprache* (Basel: Schweizerischer Bankverein, 1947), p. 57; Schneider, *Die schweizerischen Grossbanken im zweiten Weltkrieg 1939-1945*, pp. 258–62.
[395] Husy, *Die eigenen Mittel*, p. 61; Schneider, *Die schweizerischen Grossbanken im zweiten Weltkrieg 1939-1945*, pp. 258–62.
[396] Jöhr, *Schweizerische Kreditanstalt*, p. 476.
[397] See Art. 4, *BankG 1934*.
[398] See Art. 12, *BankV 1935*.

of capital was discussed at times in the annual reports of banks and regularly in the statistical publications of the Swiss National Bank. After the 1930s, however, the topic was not covered as frequently anymore. If capital was mentioned in the annual reports of banks or by the Swiss National Bank, it was only in the form of a short note that the banks met the capital requirements.[399]

Another vital part of the capital legislation was that it allowed lower capital requirements for liabilities invested in mortgages and government debt. This rule shows that the regulators aimed to adjust capital requirements to the credit risk of the assets. This more nuanced view on capital and risk coincided with structural changes in banks' balance sheets at the time. During the war, the share of government debt in balance sheets grew. After the war, the Big Banks substantially increased their share in short-term loans to companies and later in mortgages. Short-term loans bore less risk than direct holdings of companies. Moreover, holding direct investments in companies had lost importance during the interwar years.[400] The geographic diversification of loans also increased. Foreign investments had been particularly skewed towards Germany until the 1930s. As for mortgages, these were thought to be of low risk as the land was collateralised.[401] Overall, lower risks through shorter maturities, diversification, and secured assets meant that a bank would require comparably less capital – and both regulators and banks were aware of that.

The Swiss National Bank also did not seem to be concerned by the falling capital/assets ratio, outlining that the structure of the assets had changed, and the fact that both the liquidity and the capital ratios of the Big Banks were substantially above the regulatory requirements.[402]

[399] See respective annual reports by the Schweizerische Nationalbank SNB, 'Das Schweizerische Bankwesen', various years. In the annual reports of UBS, the Swiss Bank Corporation, or Credit Suisse, capital adequacy was no longer discussed. The banks only mentioned the amount of capital and announced capital increases. Occasionally, banks would refer to the fact that they had met the capital requirements.
[400] For an overview of investments by the Big Banks in other companies before and after the Second World War, see: Linder, *Die schweizerischen Grossbanken*, pp. 101–4. Schneider, *Die schweizerischen Grossbanken im zweiten Weltkrieg 1939-1945*, pp. 179–209.
[401] Jöhr, *Schweizerische Kreditanstalt*, p. 476.
[402] Swiss National Bank, *Das Schweizerische Bankwesen 1951*, p. 17.

5.2.3. The United Kingdom After the First World War: Amalgamations Movement and Public Pressure to Recapitalise

By the beginning of the 20th century, bank capital was no longer a central topic in British banking. Back in 1827, James William Gilbart had suggested a capital/liability ratio of one to three. Referencing that rule in 1914, *The Bankers' Magazine* noted: 'This practice is now but a matter of history.'[403] Instead, the magazine praised the advantages of short-term securities and their relevance for capital ratios:

> Banks holding such securities, which turn themselves into money, may with safety venture to keep their capitals small as compared with their liabilities, and though the yield obtained from discounting good bills is not high, yet compared even with first rate fixed securities they are safer securities for banks to hold.[404]

Joseph Sykes, still an important reference on the history of England's amalgamations movement, argued that the topic of adequate bank capital did not receive serious attention until 1918.[405] The years after the First World War also marked the last period in five decades to come in which the capitalisation of British banks was questioned publicly, as will be shown in Section 6.1.

From 1914 to 1918, the First World War led to an expansion of the balance sheet totals. Combined with the loss in the real value of the paid-up capital, it put the capital/assets ratio under pressure. Even though the macroeconomic environment was an essential driver of the capital ratios, it was not this process that had raised interest in the capital of English banks in 1918. Instead, it was the rapidly growing market concentration of English banking – the amalgamation movement – that had led to inquiries about the adequacy of banks' capital.

After the first establishment of joint-stock banks in England in the 1820s, the number of joint-stock banks grew rapidly for about six decades, reaching its high point in the 1880s with around 110 joint-stock banks.[406] From the 1880s onwards, the structure of the banking system changed as larger banks started to take over smaller, mostly local or

[403] The Bankers' Magazine, 'The Progress of Banking in Great Britain and Ireland During 1913', 1914, 850–70 (p. 860).
[404] The Bankers' Magazine, *The Progress of Banking in Great Britain and Ireland During 1913*, p. 860.
[405] Joseph Sykes, *The Amalgamation Movement in English Banking, 1825-1924* (London: P.S. King & Son, Ltd., 1926), p. 102.
[406] Scottish and Irish joint-stock banks (about 20) not included. See: 'The Economist Banking Supplement, Various, 1861-1946'.

provincial and private banks. The characteristics in terms of bank sizes of the merged banks changed with time, mainly because the number of small local banks diminished, and private banks that were based on a partnership model became almost extinct. From 1910 to 1918, larger banks started to amalgamate amongst each other, leading to a highly concentrated market. These banks often did not operate in different geographical locations, as had been the case before, but in the same, and therefore overlapping regions. This concentration process culminated in a series of large mergers in 1917 and 1918. In 1917, the National Provincial Bank amalgamated with the Union of London and Smiths Bank. In March 1918, Westminster amalgamated with Parr's Bank. During the summer of 1918, London City and Midland merged with the London Joint Stock Bank, Lloyds amalgamated with the Capital and Counties Bank, and Barclays with the London Provincial and South Western Bank. In 1918, there were only 26 joint-stock banks left in England.[407]

Five major banks emerged from the amalgamation period: Barclays Bank, the London County Westminster and Parr's Bank, Lloyds Bank, the London Joint City and Midland Bank, and the National Provincial and Union Bank of England. By the end of 1918, these Big Five combined held more than four-fifths of the total assets of all banks in England and Wales.[408] Overall, 19 amalgamations, involving 38 banks, took place in 1917 and 1918.[409] With these large amalgamations, public opinion became increasingly critical towards the concentrated market and requests in favour of a regulatory intervention were voiced. Generally, there was a lack of trust towards the oligopolistic banking structure, which was usually referred to as the 'Money Trust'.[410]

In February 1918, the Chancellor of the Exchequer appointed a Committee on Bank Amalgamations, also known as the Colwyn Committee.[411] The Committee was assigned to consider the effects of amalgamations and discuss potential legislation on this

[407] 'The Economist Banking Supplement, Various, 1861-1946'.
[408] Author's calculations based on individual balance sheet data. For the whole banking market, see: Sheppard, *The Growth and Role of UK Financial Institutions*.
[409] Sykes, *The Amalgamation Movement*, p. 74.
[410] For example. the *Daily Express* noted on 4 February 1918 that the amalgamation of the London County and Westminster with Parr's Bank was just another step towards 'money power in a few hands' and went on to argue that the consolidation process, which had already begun with the takeover of small local banks and private banks and had brought banking based on personal relationships to an end, eliminated competition. The article called on the Board of Trade to step in and end the 'Money Trust' system (Daily Express, 1918, from the British National Archives: T 1/12431/52485). See also: Committee on Bank Amalgamations, 'Report of the Treasury Committee on Bank Amalgamations. Treasury Minute Dated 11th March 1918', 1918, The National Archives, T 1/12325/20697. Sykes, *The Amalgamation Movement*, p. 74.
[411] The Committee's Chairman was Lord Colwyn.

matter.[412] The Colwyn Committee finished its report in May 1918 and outlined the advantages and disadvantages of amalgamations.[413] The mergers up to about 1910, in particular, were thought to have had a positive impact on the (geographical) diversification of risks and the quality of bank management.[414] One of the key findings of the report dealt with capital adequacy:

> The proportion of capital to deposits is now so small in the case of English joint stock banks – even excluding the temporary war increase in the amount of deposits – that any further shrinkage of Bank capital is clearly undesirable, in the interest of depositors, if it can be avoided. Attention has been drawn to the fact that amalgamation schemes usually mean a reduction in the total paid-up capital and uncalled liability of the two pre-amalgamation units.[415]

Banks reduced their capital through amalgamations when shares of a bank were paid in cash. In this case, the shares of the first bank taken over were cancelled. Other takeovers were achieved by paying old shareholders with fewer but more valuable shares of the surviving bank. The liabilities were then also transferred, leading to a further leveraging of the new entity.[416]

The statement above shows that the Committee was aware of the problems of low bank capital. In addition, it emphasised the conflicting interests of depositors in safety versus shareholders in high dividends, confirming the view that capital was seen as a form of insurance for depositors. The Colwyn Committee also took a critical standpoint towards the reduction of uncalled liability. In an internal circular summarising the Committee's provisional impressions, this opinion became even more evident: the cancellation of uncalled liability was thought to reduce the security of depositors. According to the

[412] The Committee held eight meetings and questioned 22 witnesses, among them also the influential bankers of the time, such as Walter Leaf, Chairman of the London County Westminster and Parr's Bank, Lord Inchcape, Director of the National Provincial and Union Bank of England, and Sir Edward Holden, Chairman and Managing Director of the London City and Midland Bank.
[413] Committee on Bank Amalgamations, *Report Committee on Bank Amalgamations, BNA, T 1/12325/20697*.
[414] See also Sayers for a similar view: Sayers, *The Bank of England*, p. 235.
[415] Committee on Bank Amalgamations, *Report Committee on Bank Amalgamations, BNA, T 1/12325/20697*.
[416] The Bankers' Magazine, 'The Progress of Banking in Great Britain and Ireland During 1918', 1919, 381–90 (pp. 382–83). The Bankers' Magazine, 'Progress of Banking in Great Britain and Ireland during 1944', 1945, p. 241.

Committee, further large amalgamations were not in the interest of the public – the only interests such amalgamations would have served were those of shareholders.[417]

In its official report, the Committee stated that arguments against further mergers outweighed those in favour. Thus, it proposed legislation that required governmental approval for amalgamations by the Board of Trade and the Treasury, which should be advised by a Statutory Committee. With regards to larger amalgamations of banks with overlapping territories, the Committee suggested that such mergers should not be permitted.[418] Despite these proposals, a law on bank amalgamations was never introduced, even though a bill was drafted and taken to parliament in April 1919.[419] The government opted for private arrangements with the banks instead of introducing statutory banking legislation.[420]

The use of informal methods to convince banks of the importance of higher capital levels was successful. Helpful was the fact that a new Advisory Committee had already been appointed in the summer of 1918 to analyse the pending mergers at the time.[421] The Committee did not have legal power, but the government could provide de facto power to the Committee based on the embargo for capital issuances introduced at the beginning of the war.[422] At the same time, the efforts of the Colwyn Committee led to a change of opinion among the bankers.

The clear stance of the Amalgamations Committee – and later also the Advisory Committee – against a further leveraging through mergers triggered bankers to strengthen their capital position.[423] The fact that a war-related increase of deposits had

[417] Committee on Bank Amalgamations, 1918, Provisional Impressions: British National Archives, T 1/12431/52485.
Barclays abolished the uncalled liability in 1921, while the other four of the Big Five did so between 1956 and 1958. See Turner, *Banking in Crisis*, pp. 131–32.
[418] Committee on Bank Amalgamations, *Report Committee on Bank Amalgamations, BNA, T 1/12325/20697*.
[419] A draft of the bill can be found in the British National Archives: T 1/12325/20697.
[420] Moreover, Sayers mentions that a more general regulation of mergers (not only banking) was discussed at the time and that the President of the Board of Trade changed from Albert Stanley to Auckland Geddes in May 1919. Stanley was one of the central opponents of bank amalgamations. Sayers, *The Bank of England*, p. 241.
[421] The advisory committee consisted of Lord Inchcape, Lord Colwyn and C.L. Stocks as Secretary. See: British National Archive: T 1/12431/52485
[422] Sayers, *The Bank of England*, pp. 79–83.
[423] Sykes notes that the Committee on Financial Facilities after the war was also against low levels of capital. Sykes, *The Amalgamation Movement*, p. 142.

led to an additional leveraging of the banking sector further strengthened the awareness among bankers.

In 1919 and 1920, the paid-up capital of English banks grew by about £20m, reaching £72m by the end of 1920. In 1920, *The Economist* noted that 'the danger of allowing this ratio [capital/deposits] to fall to so low a figure is being realised by bank directors […]'. One year later, *The Economist* stated:

> It should be pointed out that some of this increase in capital is due to the rearrangement of capital necessitated by amalgamations and alliances. At the same time, tangible evidence has been given that banks' directors have become alive to the fact that the ratio of capital and reserves to deposits had shrunk during the war to an abnormally low figure.[424]

Despite these increases in the paid-up capital, the capital ratios grew only on a small level. In 1918, the capital/assets ratio was 5.8%. The ratio grew slightly to 6.4% in 1920, even though the total assets grew as well. During the second half of the 1920s, the ratio remained at the 7% level. However, this was mostly due to the contracting balance sheets of the British banks between 1920 and 1925. The capital/assets ratio never returned to pre-war levels of above 10%.

Overall, the capital/assets ratios remained relatively stable in the interwar period, even during the Great Depression. The capitalisation of British banks did not decrease again until the Second World War.

5.2.4. The United Kingdom After the Second World War: When Banks are not Allowed to Issue Capital

> Nowadays, in England at least, capital has ceased to be necessary […].[425]

This sentence was stated in one of the most popular banking textbooks of the 20th century, written by the economist and historian Richard Sidney Sayers. *Modern Banking* was first published in 1938 and was issued in several editions up to the 1970s. Sayers argued that English banks had a long track record of stability and had built up substantial

[424] 'Banking Supplement 1921', *The Economist* (London, 21 May 1921), p. 1034.
[425] Richard Sidney Sayers, *Modern Banking Sixth Edition* (Oxford: Clarendon Press, 1964), p. 30.

hidden reserves. If it came to the capital, the author was more concerned about foreign than domestic banks:

> In some other countries, where the banks are less firmly established and public confidence could be more easily shaken, the capital of banks naturally retains its requirement relating the minimum capital to the deposit liabilities of a bank.[426]

The sentences above were printed in the sixth edition of *Modern Banking,* published in 1964. In the first edition of the textbook in 1938, Sayers avoided the topic of capital altogether.[427] He viewed liquidity as the primary source of stability in banking. This view was representative of the perception of liquidity and solvency after the Second World War.

The topic of capital and capital adequacy also received relatively little attention in the media. Both *The Economist* and *The Bankers' Magazine* had frequently discussed such topics before the war. Building up capital was seen as part of the progress of the British banking system, enhancing its resilience. The annual article in *The Bankers' Magazine* discussing the evolution of the capital/deposits ratio was no longer published after the war, having until then been published for more than four decades. Later articles in *The Bankers' Magazine* on the capitalisation of banks were mostly descriptive, simply announcing changes in the structure of the capital or capital issuances. The same applied to articles published in *The Economist,* and in contrast to the aftermath of the First World War, the idea of returning to pre-war capital ratios was not expressed in either of these two key publications.

Scholars' low levels of interest in the topic of solvency as well as the lack of media coverage have to be viewed against the policy environment at the time. As discussed in Section 5.1.1, the amount of government debt was high, and so was the share of government debt in the banks' balance sheets. One of the central goals of monetary policy after the Second World War was to ensure capital supply for government debt. Therefore the banks, as sources of finance for the government, were highly affected by the government's repressive monetary policy.[428]

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[426] Sayers, *Modern Banking Sixth Edition*, p. 30.
[427] Sayers briefly discussed the role of capital in the context of American banking: Richard Sidney Sayers, *Modern Banking First Edition* (London: Oxford University Press, 1938), pp. 42–43.
[428] Turner, *Banking in Crisis*, p. 181.

Instead of statutory regulation, as for example in Switzerland or the United States, British banking regulation was exercised in an informal and flexible way through the Bank of England. This informal supervision was guided by moral suasion and the 'Governor's eyebrows'.[429] Key tools in the Bank of England's supervisory practice were cash and liquidity ratios. The cash ratio ensured that banks held a certain amount of their deposits at the Bank of England. The liquidity ratio forced banks to hold large amounts of cash, money at call, bills of exchange, and British government bills. This led to a high share of short-term government debt in the balance sheets of banks. The cash ratio was set at 8% and had to be adhered to daily between 1946 and 1971, while the liquidity ratio ranged around 30%.[430]

With such a focus on liquidity, there was little room for capital requirements. The goal of monetary policy to ensure demand for short-term government debt, enforced through informal control and liquidity ratios, was often believed to conflict with capital requirements.[431] It was not surprising that no capital issuances took place in such an environment. During the war, no bank raised new capital, even though the capital/assets ratio fell from 5.7% to 3.0%. By 1953/1954, capitalisation reached a low point at 2.3%. Some of the Big Five were even more extreme. Barclays had a capital/assets ratio of 1.9%, Midland's capital stood at 2.1%.

Capital ratios were rapidly shrinking at the beginning of the 1950s. Were the banks reckless, not worrying about the deterioration of their capital resources? After all, banks had frequently referred to both shareholders' and depositors' interests when issuing capital until the First World War. Moreover, there seemed to be an agreement that banks would need to strengthen their capital position. Was the depletion of capital a sign that all these ideas had disappeared?

Some banks had already expressed concerns about their capital position before the war. In 1937, for example, the Westminster Bank considered its capital to be too low. Comparing ratios with the other Big Five banks, the General Manager of Westminster

[429] See for example: Forrest Capie, *The Bank of England: 1950s to 1979*, Studies in Macroeconomic History (Cambridge: Cambridge University Press, 2010), pp. 587–643; Turner, *Banking in Crisis*, pp. 181–86; Michie, *British Banking*, pp. 173–81.
[430] Turner, *Banking in Crisis*, p. 181.
[431] *Clearing Banks - Capital Increases, Internal Note*, Banking and Banking Practice: Clearing Bank Capital (London, 5 November 1959), Bank of England Archive, C40/102. In order to maintain the demand and supply for government debt, the goal was to keep interest rates stable. On the monetary policy, see for example: D. C. Rowan, 'The Monetary System in the Fifties and Sixties', *The Manchester School of Economic & Social Studies*, 41.1 (1973), 19–42.

Bank (Sir Charles Lidbury) noted internally that their own capital/deposits ratio was lower than that of the other big banks and that Westminster paid comparatively higher dividends. On the one hand, Lidbury pointed out that banks should issue capital in periods of 'cheap money' and therefore the time was right to issue capital. On the other hand, he also referred to various problems arising from a possible capital issuance. In his view, it seemed to be difficult to compensate new shareholders adequately and without 'watering down' the 'preferential position' of existing shareholders. Westminster eventually decided against a capital increase.[432]

During the Second World War, several banks attempted to raise new capital. Between September and December 1943, the National Provincial, Midland, and Lloyds Bank all approached the Governor of the Bank of England, Montagu Norman, to discuss capital issuances. The Governor replied to National Provincial that they 'must abandon the idea'. Norman argued that if '£5/6 million were needed for one bank, the total for all banks might be £40 million or £50 million' and added that 'it seems impossible that a proposal of this kind could be allowed for a single bank'.[433] The argument that the capital issuance of one bank would trigger the other banks to recapitalise as well was frequently used in later years. It was always presented along with a brief calculation showing the total amount of capital that would be tied up by all the banks if they were to capitalise. The Bank of England would clearly not have allowed a withdrawal of such high resources.

Further attempts to raise capital and reorganise their capital structure were made after the war by the National Provincial (1946), District Bank (1946, 1949), Barclays (1948, 1949, 1953), Martins Bank (1953), and Midland (1958). The banks usually argued that capital was needed to protect depositors. In order to demonstrate the need for additional capital, they compared their capital with the fixed assets (premises, investments in subsidiaries and associated companies) they held. A frequently made argument with which the Bank of England did agree was that fixed assets should not exceed the capital.[434] The difference between the capital and fixed assets came later to be known

[432] Charles Lidbury, 'Internal Note', 1934, Archive of the Royal Bank of Scotland, Edinburgh, WES/1174/206.
[433] *Clearing Banks' Capital*, Banking and Banking Practice: Clearing Bank Capital (London, 6 February 1959), Bank of England Archive, C40/102.
[434] See for example: *Letter from Barclays Chairman to Governor of the Bank of England*, Banking and Banking Practice: Clearing Bank Capital (London, 12 February 1959), Bank of England Archive, C40/102; *Martins Bank*, Banking and Banking Practice: Clearing Bank Capital (London, 5 December 1958), Bank of England Archive, C40/102; *Lloyds Bank Limited*, Banking and Banking Practice: Clearing Bank Capital (London, 18 April 1962), Bank of England Archive, C40/102.

as ‘free resources’. The ratio between ‘free resources’ and deposits was called the ‘free resources ratio’. Therefore, a new ratio emerged from the supervisory practice of the 1950s. The previously used capital/deposits ratio had lost its importance in discussions between the Bank of England and the banks.

According to the Bank of England, issuing new capital in the after-war period ‘was completely out of question under existing conditions’.[435] By existing conditions, the Bank referred to the credit squeeze of the 1950s. In the view of the Bank, capital should be used for the ‘productive’ industry.[436] Moreover, the Bank of England considered liquidity to be much more important than capital from a depositor’s point of view.[437] The Bank also noted that depositors did not seem to worry about low capital/deposits ratios:

> It cannot be said that depositors really look on the share Capital of the Clearing Banks as providing any significant protection for their deposits. The experience of the last few years, when depreciation of banks’ investments made heavy inroads on shareholders’ capital, underlines this; and if the safety of deposits were ever in doubt, it is, in any case, to liquidity that the depositors should rather look.[438]

Despite postponing new capital issuances by the banks, the Bank of England was not completely ignorant of the importance of capital. In 1946, the Bank of England told the Committee of London Clearing Bankers that they should be prepared to raise capital once the time was right.[439] The time for capital issuances came in 1958 when all of the Big Five were finally allowed to raise capital.[440] As a result, the average capital/assets ratio grew from 2.6% in 1957 to 3.2% in 1959.

The Bank of England also discussed the importance and role of capital internally. It was clear that priority was given to liquidity ratios. On the issue of solvency, however, there was a range of opinions. In 1958, for example, the Bank’s Chief Cashier surmised that ‘even in the Bank of England we are beginning to believe that Capital plays little or no

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435 *Clearing Banks’ Capital*.
436 *Clearing Banks - Capital Increases, Internal Note*.
437 *Barclays Bank Capital*, Banking and Banking Practice: Clearing Bank Capital (London, 10 April 1958), Bank of England Archive, C40/102.
438 *London Clearing Banks’ Capital, Internal Note*, Banking and Banking Practice: Clearing Bank Capital (London, 8 October 1958), Bank of England Archive, C40/102.
439 *Barclays Bank Capital*. *Committee of the London Clearing Bankers Minute Book 1946-1954*, British Bankers’ Association (London, 7 November 1946), London Metropolitan Archives, CLC/B/029/MS32006/009.
440 *Clearing Banks - Capital Increases, Internal Note*.

part in a soundly based banking structure.'[441] At the same time, internal reports at the Bank discussed the idea that long-run targets for capital/deposits ratios should be in between 5% and 7%.[442] However, such deliberations never materialised as formal or informal minimum capital standards. Instead, the British system continued on a path of informal supervision that had a clear focus on liquidity.

5.3. Conclusion

Rapidly growing balance sheets coupled with high inflation rates during the two World Wars led to substantially lower capital ratios. The banking sectors in both the United Kingdom and Switzerland were aware that these ratios had dropped during the First and Second World Wars. Such ratios – in the form of the capital/liability ratio in Switzerland and the capital/deposits ratios in the United Kingdom – were also discussed publicly.

The public discourse on the topic was more intense after the First World War than after the Second World War. Until the early 1920s, the idea of returning to pre-war levels of capitalisation was prominent in the United Kingdom and in Switzerland. Banks in both countries issued fresh capital once the First World War was over. The impact on capital ratios, however, was small.

Swiss banks were determined to maintain a certain threshold of capital, issuing capital despite the economically difficult situation of the post-war period. On the one hand, the timing of issuing capital in an economic depression seems counterintuitive, as the banks were able to realise only very small premia on their new shares. On the other hand, the Swiss banks' balance sheets were still rapidly expanding, to some extent also driven by foreign capital inflows during the 1920s. Swiss banks and the Swiss National Bank settled for a new conventional, commonly accepted capital/liability ratio of about 1:5. The ratio had been about 1:4 before the First World War.

The motives of the British Big Five banks for issuing capital after the First World War were different from those in Switzerland. The high market concentration in the banking sector resulting from the amalgamation period raised public and political interest. The Colwyn Committee, investigating the mergers, stated that the takeovers were often used

[441] *London Clearing Banks' Capital, Internal Note by the Chief Cashier*, Banking and Banking Practice: Clearing Bank Capital (London, 13 October 1958), Bank of England Archive, C40/102.
[442] *London Clearing Banks' Capital, BOEA, C40/102*; *Internal Note by the Chief Cashier - Secret*, Banking and Banking Practice: Clearing Bank Capital (London, 21 March 1961), Bank of England Archive, C40/102.

to reduce capital and that lower capital ratios were favouring the interests of shareholders, and not depositors. The discussions raised awareness for the topic among British banks and led to the last substantial capital increases for four decades to come. While certain conventions, such as guidelines for capital adequacy, were still being discussed towards the end of the 19th century (often a 1:10 capital/deposits ratio), such a discourse fell out of use in the first half of the 20th century.

In the United Kingdom, the Second World War gave rise to a repressive monetary policy that aimed to use capital resources for government debt. Moreover, the informal banking supervision of the Bank of England was oriented towards liquidity targets rather than solvency targets. Liquidity ratios ensured – in the view of the Bank of England – that a rapid demand for deposits could be met with the sale of liquid assets and the discounting of securities at the Bank of England. The Bank of England was convinced that the stability of banking was based on liquidity, rather than solvency. The historical track record of the 1930s, in which the British system had not experienced a banking crisis, certainly reinforced this view. Capital/assets ratios in the United Kingdom reached a striking low point in the beginning of the 1950s with 2.6%. The banks felt uncomfortable with such a low level of capitalisation and approached the Bank of England before, during, and after the Second World War with requests to issue new capital. The Bank of England opposed these attempts until 1958. The restrictive, non-statutory financial policy was subjected to monetary policy.

In Switzerland, by contrast, a statutory framework for the regulation of banking had been in place since 1934/1935. Indeed, the Banking Act and the Banking Ordinance were a continuation of Switzerland's liberal approach towards banking legislation. The newly established Federal Banking Commission was a weak supervisor with – at least in the beginning – unclear competences.[443] Given the 'light touch' of this regulation, it seems almost paradoxical that the new banking legislation should have introduced a fixed minimum capital ratio. However, as will be shown in Chapter 6, the banks did not oppose such minimum requirements, most likely because they met the threshold easily.

The effect of the statutory capital regulation in Switzerland was that discussions on the riskiness of business models in banking and capital adequacy disappeared from the public discourse. Instead, banks, the supervisor, and the Swiss National Bank only

[443] Bernhard Müller, 'Die Entwicklung der Bankenaufsicht in der Schweiz', *Schweizerische Aktiengesellschaft: Zeitschrift für Handels- und Wirtschaftsrecht*, 1 (1977), 1–13.

commented on whether or not banks met the capital requirements. Conventions that had developed informally were replaced by rules written down in exact numbers.

In both countries, the enormous levels of government debt, especially during the Second World War, sharpened the perception of risk in the balance sheets. By 1945, the share of government debt in the balance sheets of British banks was 61.0%. In Switzerland, the share was 18.5% for all banks and 27.0% for the Big Banks. These high ratios were increasingly considered as being low risk when capital adequacy was discussed. Similarly, the importance of liquid assets for banking stability was recognised. Such discourses already foreshadowed later developments towards risk-weighted approaches in measuring solvency.

Switzerland and the United Kingdom left the post-Second World War period on very different tracks. On the British side, there was an informal system, in which the informal supervisor attached little importance to solvency and where the banks actually asked to raise capital in order to improve their capital levels. On the Swiss side, there was a formal system with statutory minimum capital requirements that banks were about to undermine as statutory requirements became a limiting factor for growth. The next section will provide insights into how Swiss banks tried to influence regulation and how bank capital resurfaced as a topic in British banking supervision. It will also trace the evolution of the two domestic regulatory frameworks into an internationally homogenised approach towards banking legislation.

6. How Capital Regulation is Developed

The previous two chapters focused on ideas of capital and the role of the two World Wars in shaping perceptions of capital adequacy and affecting capital/assets ratios. In the absence of regulation, banks often retreated to conventions that had developed over time. Conventions often developed against a background of shareholders' and depositors' interests. The following sections discuss the evolution of regulation and supervision, trace how and why these changed over time, and shed light on the interactions between regulation and the capital level of banks.

The interwar period and the Second World War led to the emergence of banking oversight in both countries, yet based on very different concepts. In Switzerland, there was a formal regulatory and supervisory framework. The Great Depression had pushed efforts for the introduction of statutory banking legislation forward. Bank capital had been regulated since 1934/1935. The Banking Act of 1934 also established the supervising agency, the Federal Banking Commission. By contrast, the United Kingdom developed a system of informal supervision with a strong emphasis on monetary goals. The 1930s marked the beginning of a period of 'cheap money' and a tight monetary regime. The Second World War reinforced the role of monetary control. Banks were subjected to monetary goals and the Bank of England supervised banks in an informal and flexible way without an encompassing statutory framework. Capital adequacy was an almost irrelevant topic in the United Kingdom. Public attention to the subject of capital was only prompted again by the secondary banking crisis of the 1970s. It was not until 1979 that the Banking Act in the United Kingdom introduced statutory banking legislation.[444]

This chapter focuses on the evolution of the regulatory frameworks in the United Kingdom and Switzerland up to the 1980s. The chapter deals with two arguments. Firstly, both domestic and international developments provided the context and set the impulses for regulatory changes. Secondly, once regulatory adjustments were on the agenda of regulators and supervisors, banks became influential forces in shaping the regulatory design – and more specifically capital regulation.

This chapter relates to various fields of literature.[445] Numerous contributions to economics and finance discuss the impact of capital regulation on banks, with scholars emphasising both the advantages and disadvantages of capital requirements. On the

[444] *Banking Act 1979*, *C. 37*, 1979.
[445] For a broader literature review on the evolution and drivers of capital ratios, see Section 1.1.

one hand, it is argued that costs induced through higher requirements (i.e. lower return on equity, lower stock price) outweigh the potential losses for banks. On the other hand, higher capital requirements might foster risk-taking behaviour by banks (see also Section 2.3 for corporate finance theories).[446] These discussions will be left aside. Instead, this chapter focuses on the actual procedure of creating and developing capital regulation.

The financial history literature provides a good coverage of the emergence of the Basel Accord in 1988 and the convergence of capital regulation. Perhaps the seminal work in this field is Charles Goodhart's history of the Basel Committee on Banking Supervision (BCBS) from 2011.[447] Besides Goodhart, several scholars who address the history of the BCBS place it into the broader perspective of regulatory and supervisory evolution, or provide case studies that help to understand the process of financial globalisation and banking supervision. Among them are Piet Clement, Catherine Schenk, Eugene White and Gianni Toniolo, Christopher Kobrak and Michael Troege, and Alexis Drach.[448] Moreover, there are several contributions that examine the history of the BCBS from political science or international relations perspectives. One of the first to discuss the Basel Accord was Ethan Kapstein in 1989 and 1994.[449] Many publications that followed used Kapstein's narrative as a starting point.[450]

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[446] For an overview of these debates, see: James R. Barth, Gerard Caprio, and Ross Levine, *Rethinking Bank Regulation: Till Angels Govern* (Cambridge University Press, 2006), pp. 53–54.
[447] Charles A. E. Goodhart, *The Basel Committee on Banking Supervision: A History of the Early Years, 1974-1997* (Cambridge: Cambridge University Press, 2011).
[448] Piet Clement, 'The Missing Link : International Banking Supervision in the Archives of the BIS', in *State and Financial Systems in Europe and the USA: Historical Perspectives on Regulation and Supervision in the Nineteenth and Twentieth Centuries*, ed. by Stefano Battilossi and Jaime Reis (Farnham, England; Burlington, VT: EABH/Ashgate, 2010), pp. 167–75; Catherine R. Schenk, 'Summer in the City: Banking Failures of 1974 and the Development of International Banking Supervision', *The English Historical Review*, 129.540 (2014), 1129–56; Gianni Toniolo and Eugene N. White, *The Evolution of the Financial Stability Mandate: From Its Origins to the Present Day* (National Bureau of Economic Research, January 2015); Christopher Kobrak and Michael Troege, 'From Basel to Bailouts: Forty Years of International Attempts to Bolster Bank Safety', *Financial History Review*, 22.2 (2015), 133–56; Alexis Drach, 'Liberté surveillée: Supervision bancaire et globalisation financière au Comité de Bâle, 1974-1988' (European University Institute, 2016).
[449] Ethan B. Kapstein, 'Resolving the Regulator's Dilemma: International Coordination of Banking Regulations', *International Organization*, 43.2 (1989), 323; Ethan B. Kapstein, *Governing the Global Economy: International Finance and the State* (Cambridge, MA: Harvard University Press, 1994).
[450] See for example: Tony Porter, *States, Markets and Regimes in Global Finance*, International Political Economy Series (New York, London: St. Martin's Press, Palgrave Macmillan, 1993); Steven Solomon, *The Confidence Game: How Unelected Central Bankers Are Governing the Changed Global Economy* (Simon & Schuster, 1995); Thomas Oatley and Robert Nabors, 'Redistributive Cooperation: Market Failure, Wealth Transfers, and the Basle Accord', *International Organization*, 1998, 35; Duncan Wood, *Governing Global Banking: The Basel*

There are also a few contributions that focus on the United Kingdom or Switzerland specifically. For example, Forrest Capie provides a chapter on banking supervision in the United Kingdom in his history of the Bank of England.[451] John Turner also discusses the context of informal supervision, financial repression, and the introduction of statutory banking regulation in the United Kingdom.[452] In the context of Switzerland, Hugo Bänziger, Thibaud Giddey, and Tobias Straumann and Jürg Gabathuler have all published overviews of the evolution of Swiss banking regulation.[453]

In contrast to the existing literature, this chapter focuses mostly on the evolution of capital regulation, how and why regulation changed over time, and the use of capital ratios in supervisory practice. Sections 6.2 and 6.3 each provide insights into the development of the national regulatory frameworks of the United Kingdom and Switzerland, with a particular focus on the regulation of capital and the use of capital ratios in supervisory practice. Both countries converged towards a similar (risk-weighted) approach to capital regulation, but the paths and experiences leading to this approach were very different. Before turning to these different national patterns, however, Section 6.1 deals with two international topics. First, the changing economic and financial environment of the 1970s and 1980s is emphasised. Second, and related to that, the emergence of the Basel I framework on an international level is briefly outlined. Providing this international context first will allow for a better understanding of the national narratives within it.

Figure 23 shows the evolution of capital/assets ratios in Switzerland and the United Kingdom from 1940 to 1990. The average capital/assets ratio of the Swiss banks fell from about 12.0% in 1940 to 5.6% in 1970. During the 1970s and 1980s, the capital ratios ranged mostly between 6.0% and 7.0%. The capital/assets ratio of British banks fluctuated between 2.4% and 3.0% from 1945 to 1958 and recovered substantially in subsequent years. (The sudden increase in capital ratios in 1969 to 7.4% was mostly due to the disclosure of hidden reserves.) The capital/assets ratio came increasingly

Committee and the Politics of Financial Globalisation, Global Finance Series (Aldershot: Ashgate, 2005); Tarullo, *Banking on Basel*.

[451] Capie, *The Bank of England*, pp. 587–643.

[452] Turner, *Banking in Crisis*, pp. 173–203.

[453] Bänziger, *Die Entwicklung der Bankenaufsicht in der Schweiz*; Tobias Straumann and Jürg Gabathuler, 'Die Entwicklung der Schweizer Bankenregulierung', in *Krisenfeste Schweizer Banken? Die Regulierung von Eigenmitteln, Liquidität und «Too big to fail»*, ed. by Armin Jans, Christoph Lengwiler, and Marco Passardi (Zürich: NZZ Libro, 2018), pp. 57–86; Thibaud Giddey, *Histoire de la régulation des banques en Suisse (1914-1972)* (Genève: Droz, 2019). For an overview of capital regulation in the 1980s and 1990s, see also: Daniel Zuberbühler, 'Eigenmittelvorschriften der Banken', in *Derivative Finanzinstrumente und Eigenmittelvorschriften*, ed. by Rolf H. Weber and Christine Hirszowicz (Zürich: Schulthess, 1995), pp. 113–45.

under pressure at the beginning of the 1970s and the 1980s. Not included in Figure 23 is non-paid capital by shareholders. This form of shareholder liability would increase the 'total capital strength' of the assessed banks substantially until the beginning of the 1960s, which is discussed later (see Section 6.3.1).

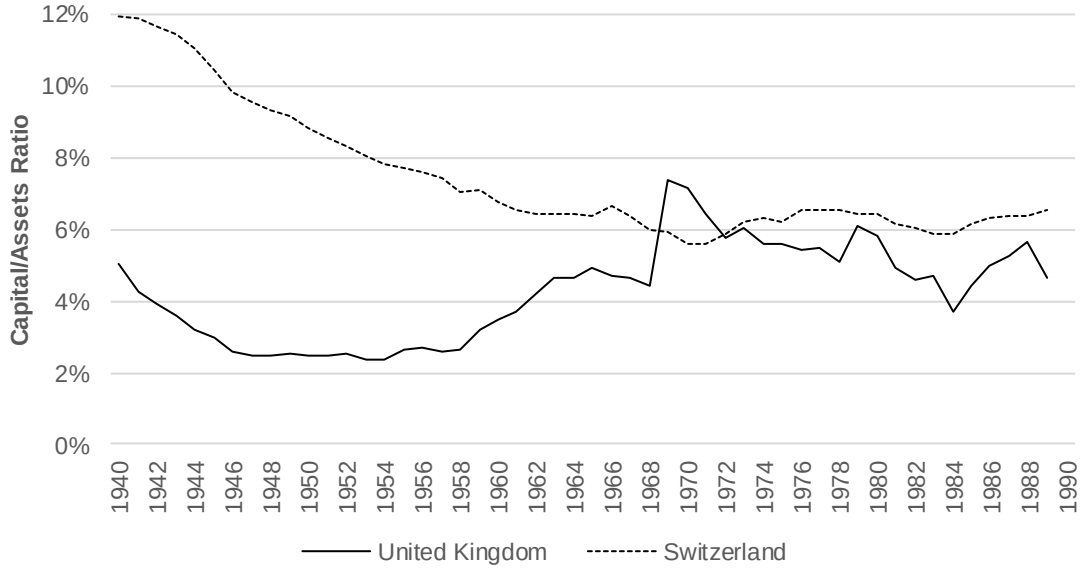

Figure 23: Capital/Assets Ratio, United Kingdom and Switzerland, 1940-1990[454]

[454] Data Switzerland: Swiss National Bank, *Historical Time Series*. Data United Kingdom: 1880-1966, all banks: Sheppard, *The Growth and Role of UK Financial Institutions*.; 1967-1978: Data obtained from individual annual reports of Big Four/Big Five due to lack of data availability in official statistics (official statistics included subordinated debt as capital); 1979-1983, clearing banks: Revell, *Costs and Margins in Banking: Statistical Supplement*.); 1984-2008, all banks: OECD, *Income Statement and Balance Sheet Statistics*.)

6.1. The International Environment and Regulatory Convergence

The macroeconomic and financial sphere was redefined with the end of Bretton Woods at the beginning of the 1970s. The European currencies had already returned to convertibility back in 1958. The balance sheets of the major banks in the United Kingdom and Switzerland expanded rapidly from the 1950s onwards and the financial centres in the respective countries gained importance. London established itself as a hub for the Eurodollar market towards the end of the 1950s and the financial hub in Switzerland attracted large-scale capital inflows, of which substantial volumes were invested abroad. In the 1960s, the top three financial centres in terms of global importance were New York, London, and Switzerland.[455]

Various events between the 1960s and 1980s questioned the stability of the monetary system and with that, the stability of financial markets. The euro-currency markets grew rapidly after the late 1950s. The unregulated offshore market for short-term funds in US currency – the Eurodollar market – increasingly undermined the Bretton Woods system of pegged exchange rates and questioned the monetary control of central banks. By 1971, the US government had decided to terminate the convertibility of US Dollar to gold, which initiated the transition to a system of flexible exchange rates. The end of Bretton Woods, together with the oil crisis of 1973, led to increasing financial instability, coupled with inflation and diverging interest rates around the world.[456]

The failure of two banks in 1974 triggered the reassessment of risk, regulation, and supervision in banking. In the United States, the Franklin National Bank collapsed in May 1974. In Germany, the small German Bank Herstatt failed due to speculation on foreign exchange markets.[457] The collapse of Herstatt in particular and the disturbances on foreign exchange markets fuelled concern about financial stability and led to the creation of two initiatives to foster international cooperation in the 1970s: the Basel Committee of

[455] Cassis, *Commercial Banks in the 20th-Century Switzerland*, p. 71.
[456] For an overview on Bretton Woods, see for example: Eichengreen, *Globalizing Capital*, pp. 93–128. For an outline of the international environment from the 1950s to the 1980s and the development of international organisations, see also: Youssef Cassis, *Crises and Opportunities* (Oxford: Oxford University Press, 2011), pp. 121–30.
[457] On the effects of banking failures – more specifically those of Herstatt, Lloyds Lugano, and the Israel-British Bank – on the evolution of the financial system see: Schenk, *Summer in the City*.

Banking Supervision at the Bank of International Settlements (BIS) and the Committees of the European Economic Community (EEC).

First to emerge was an ad-hoc working group established in 1969 by supervisors of the EEC member countries to discuss a potential harmonisation of banking legislation. In 1972, the working group became a permanent place for discussing regulation and supervision, with the title 'Groupe de Contact'.[458] The supervisors discussed, on an informal level, various issues that had surfaced in the context of the internationalisation of finance. Among these issues were, for example, common publication standards for bank balance sheets, cross-border examinations of banks' foreign subsidiaries, the Euro-currency markets, or the measurement of solvency and liquidity in the respective countries.[459] Many of these discussions were taken up by the European Commission, which produced a first Draft Directive for the coordination of banking legislation in 1972. The proposed paper was an all-encompassing framework that would have regulated all credit institutions, managerial competences, as well as solvency and liquidity.[460] However, the far-reaching regulatory ambitions for the Directive were lowered once the United Kingdom joined the EEC in 1972.[461] As will be shown in the later sections, the European attitude towards regulation was in stark contrast to the discretionary approach taken towards regulation in the United Kingdom. Nevertheless, the First Banking Directive by the European Commission, as well as the establishment of official working groups, had pushed the development of concepts to measure capital adequacy forward.

The EEC members adopted the First Banking Directive in 1977. The key feature of the directive was that each member state needed to have an authorisation procedure for credit institutions.[462] The capital requirements in the directive were related to that. It stated that institutions 'must possess adequate minimum own funds' when applying for authorisation and that a supervisor could withdraw the authorisation if an institution 'no longer possesses sufficient own funds'.[463] Article 6 also stated that domestic authorities should establish liquidity and solvency ratios for monitoring purposes. In order to

[458] The Groupe consisted of officials from the supervisory authorities of the by then six EEC member countries: Belgium, France, Germany, Italy, Luxembourg, and the Netherlands.
[459] Goodhart, *The Basel Committee on Banking Supervision*, pp. 19–22.
[460] See: Capie, *The Bank of England*, p. 600.
[461] Kapstein, *Governing the Global Economy*, p. 134.
[462] Peter W. Cooke, 'Self-Regulation and Statute - the Evolution of Banking Supervision', in *UK Banking Supervision*, ed. by Edward P.M. Gardener (London: Allen & Unwin, 1986), pp. 85–98 (p. 89).
[463] Council of the European Communities, *First Council Directive on the Coordination of Laws, Regulations and Administrative Provisions Relating to the Taking up and Pursuit of the Business of Credit Institutions*, 1977, Art. 3 & 8.

harmonise solvency and liquidity definitions, a special Advisory Committee should 'decide on the various factors of the observation ratios'.[464]

The Advisory Committee did not propose minimum capital requirements, but rather four different ratios for observational purposes: a risk assets ratio (own funds / risk assets), a gearing ratio (own funds / other liabilities), a fixed assets ratio (own funds / fixed assets), and a large exposures ratio (own funds / total large exposures).[465] The members of the Committee defined 'own funds' as paid-up capital, reserves, and provisions that were made for unexpected losses, and therefore had the character of reserves. With regards to subordinated debt, the Committee opted for two definitions of 'own funds', one which included and one which excluded subordinated debt. This distinction reflected the diverging views on the definition of capital in the different EEC member countries.

For the 'risk assets ratio', the Advisory Committee defined three categories with which to weight assets. Zero weighting was given to assets guaranteed by institutions of the EEC or guaranteed by an EEC member country and a specific list of countries (referred to as the preferential zone).[466] Assets of credit institutions (and assets with guarantees from such institutions) from the preferential zone were assigned a 20% weight. All other assets were weighted with 100% (e.g. domestic credit to the private sector, assets from the non-preferential zone). For loans covered by 'real estate or marketable securities', the national supervisors could make their own weighting decisions.[467] The EEC's framework did not stipulate a minimum capital requirement but presented a reliable framework for assessing capital adequacy.

In 1989, the European Commission adopted the Second Banking Coordination Directive, introducing the Single Banking Licence in Europe.[468] This 'single passport' allowed banks

[464] Council of the European Communities, *First Council Directive on the Coordination of Laws, Regulations and Administrative Provisions Relating to the Taking up and Pursuit of the Business of Credit Institutions*, Art. 6.
[465] Commission of the European Communities, Advisory Committee on Banking Coordination, *Notice on the Calculation of Observation Ratios for Assessing Bank Solvency*, Committee of London Clearing Bankers. Capital and Liquidity Adequacy of Banks' (London, 1 May 1980), London Metropolitan Archives, CLC/B/029/MS32152B/004.
[466] The countries were the EEC members and Australia, Austria, Canada, Finland, Iceland, Japan, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, and the United States. Commission of the European Communities, Advisory Committee on Banking Coordination, *Calculation Observation Ratios, LMA, CLC/B/029/MS32152B/004*, pp. 7–8.
[467] Commission of the European Communities, Advisory Committee on Banking Coordination, *Calculation Observation Ratios, LMA, CLC/B/029/MS32152B/004*, p. 10.
[468] Council of the European Communities, *Second Council Directive 89/646/EEC of 15 December 1989 on the Coordination of Laws, Regulations and Administrative Provisions Relating to the Taking up and Pursuit of the Business of Credit Institutions*, *89/646/EE*, 1989.

from the EEC member states to establish subsidiaries and provide services throughout EEC countries. More important with regards to capital adequacy were the 'Own Funds Directive' and the 'Solvency Ratio Directive' in 1989.[469] These two directives, however, did not build directly on the proposals by the EEC's own Advisory Committee developed in the 1970s. Instead, the EEC mostly translated the 'Basel Accord on International Convergence of Capital Measurement and Capital Standards' by the BCBS into the European legal framework.

At the BIS, the BCBS had started working on the very same topic – capital adequacy – only shortly after the EEC's Advisory Committee went to work. In September 1974, the central bank Governors at the BIS had decided to establish a 'Standing Committee on Banking Regulations and Supervisory Practices', later termed the 'Basel Committee for Banking Supervision'. The aim of the BCBS was to 'intensify the exchange of information between central banks on the activities of banks operating in international markets and, where appropriate, to tighten further the regulations governing foreign exchange positions.'[470] While this statement in the press release was fairly broad, internal understanding of the BCBS and its goals was much clearer. George Blunden, the first Chairman of the BCBS, noted that 'our main objective is to help ensure the solvency and liquidity of banks'.[471]

The BCBS advanced several suggestions that became cornerstones of banking regulation and supervision. It promoted the concept of home country control, which established that every financial institution, including foreign subsidiaries, is supervised by its national supervisor. The first step in this direction was the BCBS' proposal in 1978

[469] Council of the European Communities, *Council Directive 89/299/EEC of 17 April 1989 on the Own Funds of Credit Institutions*, *89/299/EEC*, 1989; Council of the European Communities, *Council Directive 89/647/EEC of 18 December 1989 on a Solvency Ratio for Credit Institutions*, *89/647/EEC*, 1989.
[470] The press communiqué published on 10 September 1974 is cited in: Goodhart, *The Basel Committee on Banking Supervision*, p. 39.
[471] See notes for the preparation of the opening remarks for the first BCBS meeting by George Blunden, cited in: Goodhart, *The Basel Committee on Banking Supervision*, p. 45.

to use consolidated balance sheets and income statements in supervisory practice.[472] A topic, by the way, which had already been being discussed in the EEC since 1972.[473]

The topic of the soundness and safety of the financial system gained further significance with the outbreak of the Latin American Debt crisis in 1982. After banks had increased their lending to developing countries for many years, the crisis led to a reassessment of sovereign risk, and with that questioned the solvency of both international banks and regional banks that had engaged in syndicated loans.[474] One impulse seemed to be of particular relevance for the later evolution of the Basel Accord. The US Congress debated the increase of the United States' quota at the International Monetary Fund in 1983. In this context, the US Congress demanded a review of banking regulation and capital requirements for large domestic commercial banks. Moreover, fearing competitive disadvantage as compared to foreign banks, the Congress also asked to promote the international convergence of capital requirements.[475] Developing a level playing field was certainly of importance both from the US and the European perspective. The Japanese banks were traditionally operating with much lower capital ratios than their US-American and most of their European competitors.[476] Moreover, Japanese banks were controlling about one eighth of all US assets and the United States and Japan were in a trade conflict.[477]

On the US side, a group of supervisors started to work on a new system to measure capital adequacy.[478] Internationally, Paul Volcker, Chairman of the Federal Reserve, took the matter to the meeting of the Governors at the BIS in 1984. Volcker even suggested the introduction of a leverage ratio of 5%, which was rejected by the Governors.[479] At the

[472] The necessity of the principle of home country control was demonstrated by the failure of Banco Ambrosiano in 1982, which had a holding company in Luxembourg and subsidiaries in Italy and Panama. See for example: Ethan B. Kapstein, 'Architects of Stability? International Cooperation among Financial Supervisors', BIS Working Papers, 2006, p. 7; Charles A. E. Goodhart, 'Financial Supervision from an Historical Perspctive: Was the Development of Such Supervision Designed, or Largely Accidental?', in *The Structure of Financial Regulation*, ed. by Charles A. E. Goodhart, David G. Mayes, and Geoffrey E. Wood, Routledge International Studies in Money and Banking (London: Routledge, 2007), pp. 43–64 (p. 58).
[473] It had been frequently discussed already by the Groupe de Contact. Goodhart, *The Basel Committee on Banking Supervision*, pp. 12–25.
[474] Kapstein, *Governing the Global Economy*, pp. 104–6; Wood, *Governing Global Banking*, p. 72.
[475] Kapstein, *Governing the Global Economy*, pp. 92–95.
[476] Wood, *Governing Global Banking*, p. 77.
[477] Solomon, *Confidence Game*, p. 415.
[478] Supervisors from the Federal Reserve Board in Washington and the Federal Reserve of the Bank of New York were involved in this process. Kapstein, *Governing the Global Economy*, p. 110.
[479] Drach, *Supervision bancaire et globalisation financière*, p. 336.

time, the US supervisors (Federal Reserve, Office of the Comptroller of the Currency and the Federal Deposit Insurance) were using a minimum capital/assets ratio of about 5%.[480]

Even though this first attempt for an internationally agreed capital requirement failed, the BCBS continued its work on a framework for capital adequacy. One of the key problems was the variety of different national standards and definitions of capital, which made the measuring of capital adequacy across countries more difficult. In 1984, the BCBS started to assess the capital level of large international banks using several definitions for capital.[481] Nevertheless, the issue of having fundamental differences in the national regulatory systems remained. In January 1987, the United States and the United Kingdom announced that they had reached an agreement on regulating capital adequacy. The bilateral agreement bypassed the work of the BCBS. It consisted of a common definition of capital, the use of a risk-weighted assets approach, and the inclusion of off-balance-sheet items. Later in the year, the agreement was extended to Japan. Confronted with this fait accompli, the BCBS' negotiations were severely accelerated. In December 1987, the supervisors in the BCBS agreed to a common framework for the measurement and adequacy of capital.[482]

The central bank Governors at the BIS adopted the Basel Accord in 1988. The Accord defined capital, set weights for calculating risk-weighted assets, and introduced a capital requirement. The capital requirements specifically addressed credit risks and left the regulation of other risk types to national authorities.[483] The agreement differentiated between core capital (Tier 1) and supplementary capital (Tier 2). The former consisted of paid-up equity capital and disclosed reserves, whereas the latter included hidden

[480] Kapstein, *Governing the Global Economy*, p. 110. Tarullo, *Banking on Basel*, p. 36.
[481] Goodhart, *The Basel Committee on Banking Supervision*, pp. 151–67; Drach, *Supervision bancaire et globalisation financière*, pp. 335–41.
[482] The existing literature discusses various reasons that led to the breakthrough in the negotiations. Kapstein established the first narrative by emphasising the leadership of the US and the UK together with the growing recognition for risks in banking (Kapstein, *Resolving the Regulator's Dilemma*; Kapstein, *Governing the Global Economy*.) Oatley and Narbors highlight the role of competition and the interest of the US in a level playing field (Oatley and Nabors, *Redistributive Cooperation*.). Drach provides a more differentiated view, incorporating several European countries and showing that Basel I was not simply the result of pressure by the US and the UK, but resulted also from a desire for regulatory convergence on a European level, as well as the aim of most European countries to strengthen the capital position of their banks (Drach, *Supervision bancaire et globalisation financière*.).
[483] Basel Committee on Banking Supervision, *Basel I*, p. 2.

reserves, revaluation reserves, general provisions, hybrid debt capital instruments and subordinated debt. At least 50% of the required capital had to be Tier 1 capital.[484]

The two-tier structure of capital was a compromise between the varying national traditions. As will be shown in later sections, Switzerland and the United Kingdom provide good examples for countries translating national regulatory conventions into the Basel Accord. The British perceived subordinated debt as comparable to equity capital. In Switzerland, hidden reserves could be used as part of the required capital since 1961. The Basel Accord also set five risk classes for on- and off-balance sheet items, which allowed for the calculation of risk-weighted assets. Tier 1 and tier 2 capital would have to be at least 8% of the risk-weighted assets.

The 8% capital ratio was based on a compromise. Charles Goodhart argues that the 8% 'emerged naturally', as analyses had shown that the ratios of most banks already ranged in the area of 7% to 10%.[485] Alexis Drach highlights that the BCBS had already been running analyses and solvency calculations since 1984. Suggestions in 1985 and 1987 targeted 10% and 9% as a total capital ratio (Tier 1 & 2 capital). The BCBS ran various analyses comparing the capital level of banks in different countries compared to suggested capital requirements. Banks in France and Japan were undercapitalised compared to the discussed capital requirements. For the United Kingdom, the inclusion of subordinated debt was crucial to meet the requirements. The Swiss banks were comparably well capitalised and meeting the standards did not seem to be an issue.[486]

The BCBS was clearly not where the idea of risk-weighted assets as a tool to assess capital adequacy originated. On a European level, similar concepts were already put forward as a result of the First Banking Directive in 1972. The European and international attempts towards the regulation of capital did not develop independently. Goodhart points out that several individuals were a member of two or even three of the committees working on capital adequacy at the same time (the unofficial Groupe de Contact, the official Advisory Committee by the EC, and the BCBS).[487] Thus, much of the knowledge already present and further developed by the BCBS had probably been accumulated through work on the European level.

[484] Basel Committee on Banking Supervision, *Basel I*, pp. 3–7.
[485] Goodhart, *The Basel Committee on Banking Supervision*, p. 178.
[486] Drach, *Supervision bancaire et globalisation financière*, pp. 335–42.
[487] Goodhart, *The Basel Committee on Banking Supervision*, p. 24.

After having outlined the main lines of development that led an agreement on capital regulation at international level, the next sections rewind to the national experiences that preceded this harmonisation. For Switzerland, the section will go back to the interwar period. In 1934 and 1935, banking was regulated on a national level for the first time. The section on the United Kingdom focuses on the post-war period leading up to the late 1980s.

6.2. Regulation in Switzerland – and How it Was Influenced

The Great Depression and its severe effects, especially on Switzerland's Big Banks, had led to a breakthrough of banking legislation in Switzerland in 1934. Swiss banks were subject to banking legislation on a national level for the first time. Among various other areas, this banking legislation also covered capital and liquidity requirements. The new legislation was comprehensive, in the sense that it regulated many aspects of banking, but light in terms of the strictness of rules. A former Director of the Secretariat of the Federal Banking Commission, Bernhard Müller, once stated that it was 'easier to open a bank than a restaurant' before the 1970s.[488] Müller's statement might have been an exaggeration, but it emphasises the liberal spirit with which the law was drafted and the comparably weak position of the supervisor.

Introduced in 1934, it was not until 1961 that the first revisions of the banking legislation were undertaken. The regulatory changes, as will be outlined in the next sections, coincided with the development of Switzerland's banking market. A first revision of the Banking Ordinance in 1961 was of particular importance for the regulation of capital. It was the basis for later regulatory changes of the capital requirements. On a broader level, the revision of the Banking Act in 1971 was even more relevant.[489] It enlarged the circle of supervising institutions to all deposit-taking banks. Moreover, the Banking Act in 1971 incorporated stricter licencing rules both for domestic and foreign banks. The revised Banking Act also gave the Federal Banking Commission more power in supervision.[490]

The period between the 1950s and the 1980s became the 'golden age' of Swiss banking. It was marked by Switzerland's rise as global financial centre. Two major developments became apparent in the process of the internationalisation of Switzerland's financial centre. Firstly, capital inflows accelerated after the war, which in turn triggered monetary problems. There were probably several drivers that contributed to these capital inflows.

[488] Müller, *Entwicklung der Bankenaufsicht*, p. 6. Müller was the Director of the Secretariat of the FBC from 1976 to 1985.
[489] *Bundesgesetz über die Banken und Sparkassen vom 11. März 1971*, 1971.
[490] An example of the increasing supervisory power of the FBC was the frequent use of the provision that required the management to have a 'good reputation and guarantee the proper conduct of their business' (Art. 3). *BankG 1971*; Straumann and Gabathuler, *Die Entwicklung der Schweizer Bankenregulierung*, pp. 76–77. For a good overview on the evolution of Swiss banking legislation, see: Straumann and Gabathuler, *Die Entwicklung der Schweizer Bankenregulierung*.

The Swiss franc was undervalued under the fixed exchange rate regime.[491] Switzerland was both economically and politically stable, and banking secrecy was certainly important as well. The Swiss National Bank was challenged to maintain monetary control over its currency and tried to lower inflation. In this context, various administrative measures were taken, aiming to reduce foreign capital inflows. This was often done through Gentlemen's Agreements with the banks, for example those on non-interest payments on short-term foreign liabilities (from 1950), on negative interest rates on foreign deposits (1972/1974), or on the ban of investments in domestic securities and the real estate market (1972).[492]

The capital inflows were both a blessing and a curse. While they created monetary distortions, they also allowed Switzerland to gain considerable international weight. In the 1950s and 1960s, Switzerland became by far the largest foreign buyer of securities in the United States.[493] By 1970, Swiss investors held about half of the German debt which was invested by foreigners.[494] Moreover, estimates by Max Iklé, member of the SNB's Governing Board from 1956 to 1968, indicate that Swiss banks bought about 30% to 40% of the Eurobond issuances in the 1960s.[495] Swiss banks were also major players in the Eurodollar market. By 1963, Swiss banks held Eurodollar assets of USD 1.7bn and liabilities of USD 1.1bn. On par with Japan, Switzerland was the second largest lender on the Eurodollar market after the United Kingdom and the fourth largest borrower that year.[496]

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[491] After the end of Bretton Woods, the Swiss franc tended to be overvalued very often, which contributes to the argument that undervalued currency was not the sole driver of capital inflows. See: Peter Bernholz, 'Die Nationalbank 1945–1982: Von der Devisenbann-Wirtschaft zur Geldmengensteuerung bei flexiblen Wechselkursen', in *Schweizerische Nationalbank, 1907-2007*, ed. by Schweizerische Nationalbank SNB (Zürich: Verlag Neue Zürcher Zeitung, 2007), pp. 119–211 (pp. 123–24).

[492] Swiss National Bank, *75 Jahre Schweizerische Nationalbank, 1907-1982* (Zürich, 1982), pp. 34, 102, 104, 127. For an overview of Switzerland's monetary policy, see also: Bernholz, *Die Nationalbank 1945–1982*.

[493] Board of Governors of the Federal Reserve System (U.S.), *Banking and Monetary Statistics, 1941-1970*, 1976, pp. 967–75, 1002 <https://fraser.stlouisfed.org/title/41> [accessed 31 July 2018].

[494] Deutsche Bundesbank, 'Die Kapitalertragsbilanz Der Bundesrepublik Im Aussenwirtschaftsverkehr', 1971 <http://www.bundesbank.de/Redaktion/DE/Downloads/Veroeffentlichungen/Monatsberichte/1971/1971_03_monatsbericht.pdf?__blob=publicationFile>.

[495] Max Iklé, *Die Schweiz als internationaler Bank- und Finanzplatz* (Zürich: Orell Füssli, 1970), p. 136.

[496] Catherine R. Schenk, 'The Origins of the Eurodollar Market in London: 1955–1963', *Explorations in Economic History*, 35.2 (1998), 221–38 (p. 235).
For a discussion of why Switzerland did not promote a Eurodollar market in Switzerland, see: Tobias Straumann, 'Finanzplatz und Pfadabhängigkeit: Die Bundesrepublik, die Schweiz und

A second dimension of the internationalisation of Switzerland's financial hub was the attraction of foreign banks. These foreign banks were either established in Switzerland as independent (but foreign-controlled) banks or as subsidiaries. By 1970, 76 out of 473 banks in Switzerland were controlled by foreign owners. In 1980, there were 83 foreign-controlled banks and 16 subsidiaries of foreign banks. The revision of the Banking Act in 1971 therefore also addressed issues in supervising these foreign banks. For example, before 1968, the establishment of foreign banks or takeovers by foreign banks did not require authorisation. The rapid growth of foreign banks, however, was perceived as a threat.[497] In response, in 1968 the Swiss parliament introduced licencing requirements for foreign banks, which were later incorporated in the revised Banking Act.[498]

Figure 24 and Table 10 provide insights into the effects of rapid internationalisation on the Swiss banking market. Figure 24 presents the percentage of foreign assets and liabilities in the banks' balance sheet totals. One of the prerequisites for the rapid growth of the foreign capital flows was certainly the transition to convertibility of the major European currencies in 1958. In the years from 1960 to 1970, the share of foreign assets grew from 13.3% to 33.7%. The share of foreign liabilities developed similarly. The numbers regarding foreign assets and liabilities are also impressive when looking at the volumes. In 1958, the volume of foreign assets was CHF 5.9bn. In 1970, the foreign assets reached a volume of CHF 70.8bn and in 1980 CHF 182bn.

Most foreign activities stemmed from the three largest Big Banks (Credit Suisse, Union Bank of Switzerland, Swiss Bank Corporation). The rest of the capital flows were directed to or came from foreign banks and private banks in Switzerland. Other banks, such as the Cantonal banks or savings banks, played a minor role.[499] The data in Figure 24 shows

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die Vertreibung der Euromärkte (1955-1980)', in *Europas Finanzzentren: Geschichte und Bedeutung im 20. Jahrhundert*, ed. by Christoph Maria Merki (Frankfurt a.M.: Campus, 2005), pp. 245–68.

[497] The Federal Council wrote that some foreign institutions would make 'blatant and intrusive' use of the Swiss banking secrecy and that there are foreign banks with 'most serious grievances'. Moreover, the Federal Council feared a further increase of the monetary base that would lead to domestic credit expansion. Bundesrat, 'Botschaft des Bundesrates an die Bundesversammlung zum Entwurf eines dringlichen Bundesbeschlusses über die Bewilligungspflicht für ausländisch beherrschte Banken', *Bundesblatt*, 2.48 (1968), 756–71 (pp. 759–61).

[498] '*Bundesbeschluss über die Bewilligungspflicht für ausländisch beherrschte Banken vom 21. März 1969*'). For the regulatory history of foreign banks in Switzerland, see: Thibaud Giddey, 'The Regulation of Foreign Banks in Switzerland (1956-1972)', *Foreign Financial Institutions & National Financial Systems*, The European Association for Banking and Financial History, 2013, 449–85.

[499] See: Henner Kleinewefers, *Das Auslandsgeschäft der Schweizer Banken*, Schriften zum Bankenwesen (Zürich: Schuthess, 1972). Kurt Speck, *Strukturwandlungen und*

only balance sheet data. Customers' securities deposits would very likely show a very significant foreign exposure too.

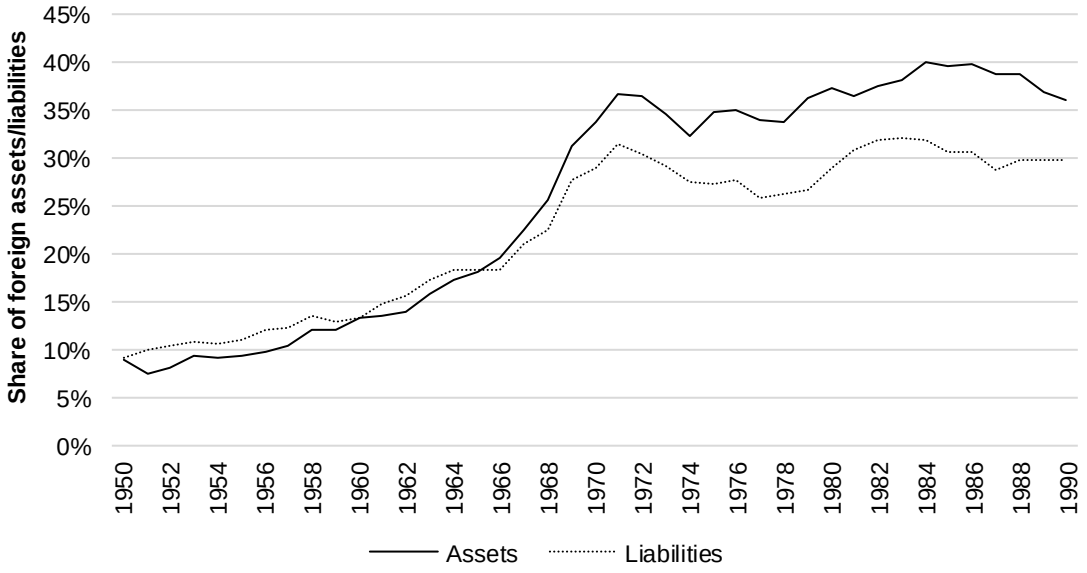

Figure 24: Percentage of Foreign Assets/Liabilities in Balance Sheets of Swiss Banks, 1950-1990[500]

	Total Assets (Growth p.a.)		Total Capital (Growth p.a.)		Capital/Assets Ratio (Average)		*Inflation*[501]
	All Banks	Big Banks	All Banks	Big Banks	All Banks	Big Banks	
1951-1960	7.4%	8.2%	4.6%	5.0%	7.6%	7.4%	*1.5%*
1961-1970	13.5%	18.3%	11.3%	15.2%	6.3%	5.8%	*3.3%*
1971-1980	8.8%	9.8%	10.5%	12.9%	6.3%	5.7%	*5.0%*
1981-1990	8.3%	8.1%	8.5%	8.4%	6.2%	5.9%	*3.4%*

Table 10: Decadal Average Growth Rates (p.a.) of Total Assets, Total Capital, Inflation (Consumer Price Index) and Average Capital/Assets Ratio, 1951-1990[502]

Entwicklungstendenzen im Auslandsgeschäft der Schweizerbanken, Prospektivstudie über das schweizerische Bankgewerbe (Zürich: Juris Druck Verlag, 1974).

[500] Data: Swiss National Bank, *Die Banken in Der Schweiz 1990*, 1991.

[501] The decadal averages of the inflation rates might be misleading since the time periods do not capture the business cycles. A more appropriate view would be a focus on the periods 1958-1966 and 1967-1975. The first cycle was marked by strong GDP growth (on average 5.3% p.a.) and moderate inflation (3.9% p.a.). The annual GDP growth fell by about 50% in the second cycle, and inflation rates grew to 6.2% p.a. See: Swiss National Bank, *75 Jahre Schweizerische Nationalbank, 1907-1982*, pp. 57–67.

[502] Bank data: Swiss National Bank, *Historical Time Series*.; Consumer Price Index: HSSO, *Historische Statistik der Schweiz Online, Tab. H.39.*, p. 39.

Table 10 shows the growth of the total assets of banks in Switzerland. From the 1950s to the 1980s, the average annual growth rate of total assets was between 7.4% and 13.5%. The Big Banks even reached annualised growth rates of 18.3% in the 1960s. One of the key drivers of these growth rates were foreign capital flows. As the total assets grew quicker than the equity capital, the capital/assets ratios declined.

The following sections describe how banking in Switzerland was regulated, how and why the regulation of capital was changed over time, and how relevant these changes were for the growth of the Big Banks in Switzerland. It will be argued that the rapid balance sheet growth would not have been possible without lowering capital requirements. Once some of the banks no longer met the statutory capital requirements, legislation was hindering growth, and banks started to demand regulatory changes.

6.2.1. Banking Legislation in the 1930s

Swiss banking legislation consisted of three layers. The banking regulation introduced in 1934/1935 was based on the Banking Act and the Banking Ordinance.[503] The former was passed by the government in November 1934 and became effective in March 1935.[504] The latter – the Banking Ordinance – outlined the application of the Banking Act and was introduced in 1935.[505] A third level was introduced in 1936: the Circulars issued by the Federal Banking Commission outlined its position on certain questions over the application of the law. The Circulars were not legally binding but gained soft law character over time. In the Circulars, the Commission described how it applied banking legislation in supervisory practice.[506]

The responsibilities for each layer of the banking legislation were and still are different. New laws and amendments have to be passed by the Swiss parliament. In contrast to the Banking Act, the Ordinance requires only the approval of the Federal Council.[507] The Circulars are in the power of the Federal Banking Commission. The three-layer system – Banking Act, Ordinance, and Circulars – remains the same today.[508]

[503] *BankG 1934*; *BankV 1935*.
[504] *BankG 1934*.
[505] *BankV 1935*.
[506] Please note that parts of sections 6.2.1 to 6.2.3 were already published here: Amrein, *Eigenmittel der Schweizer Banken im historischen Kontext*.
[507] The Federal Council is Switzerland's highest executive body consisting of seven ministers.
[508] One key difference in the regulatory structure is that the Federal Banking Commission was replaced by the Swiss Financial Market Supervisory Authority FINMA in 2009.

The Banking Act was the first comprehensive banking regulation on the national level in Switzerland. The newly introduced legal framework also regulated capital requirements.[509] Article 4 of the Banking Act stated as follows:

> Banks have to make sure, that there is an appropriate ratio between their own capital and their total liabilities. […] The Ordinance defines the rules that have to be followed under normal circumstances by taking into account the business activities and types of banks […].[510]

The Banking Ordinance (Art. 10) further expanded upon Article 4 of the Banking Act. Regulatory capital was defined as: paid-up capital, 50% of non-paid-up capital (liability), guarantees from municipalities, disclosed reserves, and retained profits (or losses).[511]

In Article 12, the Banking Ordinance set two different minimum capital requirements, depending on the type of bank and the structure of its assets. Cantonal banks and cooperative banks with the unlimited liability of their members were required to hold a capital equivalent to at least 5% of the liabilities. All other banks had to hold a minimum of 5% of the liabilities that were invested in assets covered by domestic real securities (i.e. mortgages) and government securities.[512]

The Banking Act not only stipulated an appropriate amount of capital, but also liquidity requirements.[513] There were two types of liquidity ratios: one that included only cash and reserves at the Swiss National Bank and one that considered a broader range of liquid assets.[514] The liquidity ratios were measured as a percentage of short-term liabilities.

The roots of the Banking Act of 1934 reach back to a first legislative draft that was developed between 1914 and 1916. After a series of bank defaults from 1910 to 1914,

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[509] Another important feature of the new legislation was the codification of the banking secrecy in Art. 47 of the Banking Act. For an overview on the history of the banking secrecy, see: Guex, *The Origins of the Swiss Banking Secrecy Law and Its Repercussions for Swiss Federal Policy*. Vogler, *The Genesis of Swiss Banking Secrecy*. For a more general and contemporary overview, discussing also the developments since the last financial crisis, see: Stefan Tobler, *Der Kampf um das Schweizer Bankgeheimnis: Eine 100-jährige Geschichte von Kritik und Verteidigung*, NZZ-Libro (Zürich: NZZ Libro, 2019).
[510] Art. 4, *BankG 1934*.
[511] Art. 10, *BankV 1935*.
[512] Art. 12, *BankV 1935*.
[513] 'Banks must ensure that there is an appropriate ratio between tangible assets and readily realisable assets on the one hand and short-term liabilities on the other.' Art. 4, *BankG 1934*.
[514] Liquid (tangible) assets were defined as discountable securities (discountable at the SNB), sight deposits at banks (maturity <1m), treasury bills and acceptances (maturity <3m). Short-term liabilities were defined as sight deposits from customers (maturity <1m), cheques, 15% of saving deposits, bonds and short term notes (maturity <1m). Art. 13-17, *BankV 1935*.

the Federal Council commissioned Julius Landmann, Professor of Economics at the University of Basel, to develop a draft for the regulation of banking.[515] Landmann suggested a discretion-based framework for Switzerland's bank regulation. Given that Swiss banks followed a variety of activities, ad-hoc judgements would ensure that different business models were taken into account. Moreover, Landmann claimed that a governmental authority would usually be too late to intervene in a rule-based system, proposing a flexible regulation without detailed rules. Specific capital and liquidity ratios should result from the 'practice of regulation'.[516]

Landmann's discretion-based approach, as well as much of the content of the first draft, served as a blueprint for the Banking Act of 1934. The pressure of the Great Depression and two Big Banks at the brink of default had finally led to the introduction of a nationwide banking law.[517] The regulation of capital in the Banking Act as presented above in Art. 4 was almost identical to Landmann's proposal. When the Banking Act was submitted to the parliament, the Federal Council emphasised the discretion-based approach taken in the regulation of banking. For the regulation of capital, that meant that it was 'difficult or even impossible' to stipulate a universally valid ratio between capital and liabilities for all banks. The Banking Act should provide guidelines only. Nevertheless, specific minimum capital ratios were set in the Banking Ordinance, according to the Federal Council, considering the 'nature of the different institutes'.[518]

The main goals of the new banking regulation were to increase security for creditors, ensure the supply of capital for the economy, and to improve the degree of information available to the Swiss National Bank to enhance transparency.[519] The role of capital was seen as being an absorber of losses to safeguard depositors.[520] The liquidity requirements were viewed as being equally as important as capital adequacy for the

[515] A study by the Federal Department of Economic Affairs on the banking crisis of 1910-1914 counted 17 defaults, 21 liquidations, 5 restructurings, and 2 mergers. The total losses were estimated at about CHF 110m. For a discussion of the crisis, see: Julius Landmann, *Entwurf eines Bundesgesetzes: betreffend den Betrieb und die Beaufsichtigung von Bankenunternehmungen nebst Motivenbericht* (Bern: Schweizerisches Volkswirtschaftsdokument, 1916), p. 31. Wetter, *Bankkrisen und Bankkatastrophen*.
[516] Landmann, *Entwurf eines Bundesgesetzes*, p. 91.
[517] In that sense, the introduction of banking regulation was very much a story of crises and opportunities, as described by Youssef Cassis: Cassis, *Crises and Opportunities*.
[518] Bundesrat, 'Botschaft des Bundesrates an die Bundesversammlung betreffend den Entwurf eines Bundesgesetzes über die Banken und Sparkassen vom 2. Februar 1934', *Bundesblatt*, 1.6 (1934), 171–224 (p. 176).
[519] Bundesrat, *Botschaft des Bundesrates an die Bundesversammlung betreffend den Entwurf eines Bundesgesetzes über die Banken und Sparkassen vom 2. Februar 1934*, p. 175.
[520] Bundesrat, *Botschaft des Bundesrates an die Bundesversammlung betreffend den Entwurf eines Bundesgesetzes über die Banken und Sparkassen vom 2. Februar 1934*, p. 176.

stability of banks. Both measures were usually mentioned together and perceived as an instrument for the protection of depositors. The statement by the Federal Council in 1934 is fairly representative for the time: 'It is not sufficient for the deposits to be secured in principle [by capital and reserves]; they must also be able to be withdrawn within the specified time limits'.[521]

The Federal Department for Finance and Customs was charged with drafting the Banking Act and Ordinance.[522] In an internal report, the Department analysed the capital structure of the Swiss banks in February 1934.[523] The authors remarked that there was a strong relationship between the level of capital and the share of mortgages: savings and Raiffeisen Banks held the lowest capital and had the comparatively highest shares of mortgages on the asset side. The group of Cantonal banks, also mainly focused on the mortgage business, held only slightly more capital than the other two bank groups. The authors of the report believed that 'banks with a predominant mortgage business have normally lower risks than trading banks'. By 'trading banks', they were referring to the group of Big Banks. The Federal Department for Finance and Customs also discussed the liability of the banks' owners. Most Cantonal banks at the time had government guarantees, and Raiffeisen Banks were cooperative banks with unlimited joint guarantees of their members. The Department, therefore, proposed that the mortgage share and the form of the liability should be considered if capital requirements were introduced.[524] Both recommendations found their way into the banking legislation.

The group of experts developing the law believed that using the mortgage share and liability situation of a bank to determine an adequate capital was only the second-best option. In principle, the authors thought that the size of capital should depend on the risks

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[521] Bundesrat, *Botschaft des Bundesrates an die Bundesversammlung betreffend den Entwurf eines Bundesgesetzes über die Banken und Sparkassen vom 2. Februar 1934*, p. 177.
See also: Paul Rossy and Robert Reimann, *Bundesgesetz über die Banken und Sparkassen vom 8. November 1934: mit Vollziehungsverordnung vom 26. Februar 1935 und Verordnung des Bundesgerichts betreffend das Nachlassverfahren von Banken und Sparkassen vom 11. April 1935* (Zürich: Polygraphischer Verlag, 1935), p. 21.: 'The provisions of this section are intended to safeguard creditors. On the one hand, they oblige banks to ensure a sound financial basis so that depositors do not risk losses in the event of any shock. On the other hand, they require adequate liquidity to be maintained so that a bank does not have to resort immediately to the National Bank when withdrawing funds.'

[522] 'Eidgenössisches Finanz- und Zolldepartement' / 'Département fédéral des finances et des douanes'

[523] Eidgenössisches Finanz- und Zolldepartement, *Bericht über die statistischen Grundlagen für die Aufstellung von Ausführungsbestimmungen zu Art. 10 des Entwurfes zu einem Bundesgesetz über die Banken und Sparkassen vom 2. Februar 1934* (Bern, 2 February 1934), Swiss Federal Archives, E6520A#1000/1059#5*.

[524] Eidgenössisches Finanz- und Zolldepartement, *Bericht statistische Grundlagen, SFA, E6520A#1000/1059#5**, pp. 4–5.

that each individual bank took and that those risks could be 'found in the assets'.[525] However, the experts concluded that 'it is impossible to find a measure for the risks on the asset side; it is not like reading the temperature on a thermometer.'[526] Nevertheless, one could argue that the final legislation already provided a simple risk-weighted approach. It was just that there were only two risk categories: mortgages and government securities on the one hand, and all other assets on the other hand. Instead of a risk-weighting of assets, two different minimum capital ratios were applied to the two classes.

When discussing various possible capital ratios, the group of experts of the Federal Department for Finance and Customs discussed the idea that capital requirements should balance the interests of creditors and shareholders. For creditors, the experts emphasised the role of capital as a buffer against losses. Regarding shareholders and banks, it was argued that excessive capital ratios could lead to more risk-taking by banks, since they would be pressured to provide sufficiently high returns to their shareholders.[527]

The considerations for an appropriate liquidity requirement were almost identical to those on capital adequacy. The group of experts argued that banks with a high share of mortgages bore a lower risk. Thus, they should be allowed to have lower liquidity ratios. Furthermore, the experts noted that bigger banks, measured by total assets, should hold more liquid assets as they were systemically more relevant 'to maintain the ability to pay'.[528]

Apart from this argument on the systemic stability of the financial market, another issue became apparent in the context of liquidity: in contrast to capital adequacy, liquidity was perceived as relevant for monetary policy. Liquidity ratios were not actively used to influence the individual business policies of banks, such as domestic lending policies, accepting foreign capital, or investing abroad.[529] The relevance of liquidity ratios for monetary policies, however, was recognised. One of the central concerns of the Banking Act was to increase the transparency of the banking market for the Swiss National Bank.

[525] Eidgenössisches Finanz- und Zolldepartement, *Bericht statistische Grundlagen, SFA, E6520A#1000/1059#5**, p. 4.
[526] Eidgenössisches Finanz- und Zolldepartement, *Bericht statistische Grundlagen, SFA, E6520A#1000/1059#5**, p. 4.
[527] Eidgenössisches Finanz- und Zolldepartement, *Bericht statistische Grundlagen, SFA, E6520A#1000/1059#5**, pp. 6–11.
[528] Eidgenössisches Finanz- und Zolldepartement, *Bericht statistische Grundlagen, SFA, E6520A#1000/1059#5**, p. 20.
[529] Another important feature with regards to the foreign capital flows, however, was that the Swiss National Bank could veto certain foreign transactions. Art. 8, *BankG 1934*.

The commercial banks had to submit monthly or quarterly balance sheets (depending on their size) that allowed an assessment of their liquidity by the Swiss National Bank.

The final introduction of a minimum capital ratio in the Banking Ordinance is somewhat surprising, given the liberal character of the legislation that was meant to be restricted to a 'few general principles'.[530] The banks themselves did not resist these capital requirements. During the consultation process, various interest groups submitted their suggestions for the drafting of the law. Credit Suisse's general manager, Adolf Jöhr, was primarily concerned that private banks should not be excluded from capital requirements.[531] The Cantonal banks wanted to be excluded from being subjected to banking legislation altogether, claiming that the regulation of Cantonal banks would undermine Cantonal sovereignty.[532] And the Berne Audit Association, a self-regulatory body auditing its member banks, suggested a capital/deposits ratio of 10%, as its member banks already voluntarily adhered to this ratio.[533]

The use of capital ratios was already well accepted as a vital factor for the soundness of a bank before the introduction of banking legislation in the 1930s. There were already conventions among the banks with regards to capital adequacy for different groups of banks (e.g. that of the Berne Audit Association). Also, the group of the bank (e.g. Cantonal bank, Big Bank) served as a proxy for the riskiness of a business model. To some extent, the capital requirements formalised conventions that already existed before. The introduction of a capital threshold was further facilitated by the fact that most banks fulfilled the requirements. Based on year-end figures of 1932, the Federal Department of Finance and Customs had discussed potential capital/liability ratios between 5% and 15%. The Department's analysis showed that most banks would have fulfilled these requirements.[534] On a broader level, the Big Banks in particular had little negotiating power once they started to accumulate significant losses in the 1930s.

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[530] Bundesrat, *Botschaft des Bundesrates an die Bundesversammlung betreffend den Entwurf eines Bundesgesetzes über die Banken und Sparkassen vom 2. Februar 1934*, p. 174.
[531] Adolf Jöhr, *Letter from Credit Suisse's General Manager Dr. Adolf Jöhr to the Director of the Department of Finance* (Zurich, 26 December 1933), Swiss Federal Archives, E6520A#1000/1059#5*.
[532] *Letter from the President of the Association of Swiss Cantonal Banks to Minister of Finance* (Basel, 14 October 1933), Swiss Federal Archives, E6520A#1000/1059#23*.
[533] President and Secretary of the Auditing Association, *Letter from the Association for the Auditing of Banks and Savings Banks in Berne to the Minister of Finance ('Revisionsverband der bernischen Banken und Sparkassen')* (Bern, 2 December 1933), Swiss Federal Archives, E6520A#1000/1059#27*.
[534] Schweizerisches Bundesarchiv, E6520A#1983/50#62*.

6.2.2. The Evolution of Capital Regulation: 1934-1991

Figure 25 visualises the evolution of capital regulation in Switzerland from 1934 to 1991. There are two key components of the regulation: capital requirements (required capital), and the definition of capital from a regulatory point of view (regulatory capital). In 1961, the Banking Ordinance and its capital requirements were revised for the first time. Changes were made on two levels. First, a lowered ratio for investments made in liquid assets was introduced, which reduced the required capital. For banks that were not Cantonal or cooperative banks, that meant that were three risk classes on the asset side: liquid assets, assets invested in government securities or covered by mortgages, and all other assets. Second, the definition of the regulatory capital was broadened. The revised Banking Ordinance allowed any kind of 'free reserves' to be used as part of the capital. That included hidden reserves. The extent of this use could be set by the Federal Banking Commission.[535]

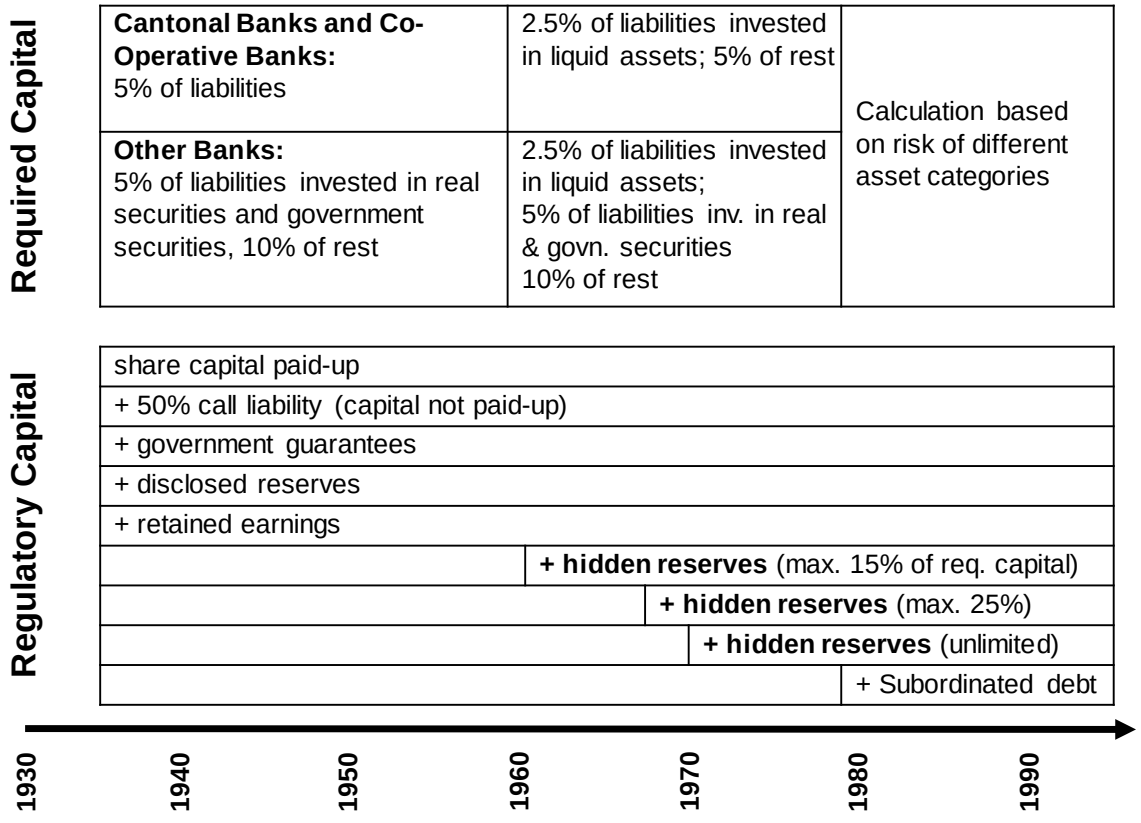

Figure 25: Capital Regulation in Switzerland, 1934-1995

[535] *Vollziehungsverordnung zum Bundesgesetz über die Banken und Sparkassen vom 30. August 1961*, 1961 Art. 9f.

The Federal Banking Commission allowed that up to 15% of the required capital could consist of hidden reserves. The ratio was increased to 25% in 1967. After 1972, hidden reserves could be used as part of the required capital without any restrictions at all. After 1981, banks could also use subordinated debt as part of their required capital (up to 10%; the ratio was further increased in 1988). Thus, the definition moved closer towards what came to be Tier 2 capital in Basel I. By 1981, the definition of regulatory capital in Swiss legislation was almost identical to that in the Basel Accord.

The revision of the Banking Ordinance of 1981 also brought the introduction of a risk-weighted approach. For the first time, the capital was not measured against liabilities, but against assets. According to the Federal Banking Commission, the new approach allowed a better consideration of the different business activities and structures of banks.[536]

Having presented capital regulation as introduced in 1934/1935, and the changes it subsequently underwent up to 1991, the question remains of whether or not banks actually met the statutory capital requirements. In order to assess this, one can divide the regulatory capital by the required capital. The percentage is the so-called capital coverage ratio.[537] If the ratio is above 100%, a bank holds more capital than legally required. Until the revision of the Banking Ordinance in 1961, most balance sheet items relevant for calculating the capital coverage ratio were public. After 1961, the opacity of the banking market was significantly increased as hidden reserves could be used as well. In 1953, however, the Swiss National Bank started to publish the capital coverage ratio for all bank groups in Switzerland.[538] Based on a few assumptions, one can estimate the capital coverage ratio for the period of 1935 to 1953.[539]

Figure 26 shows the capital coverage ratio from 1935 to 1991. The average of all Swiss banks together was above the minimum capital requirement of 100% for the entire period. However, the capital coverage of the group of Big Banks deteriorated rapidly after the end of the Second World War, and in the mid-1950s the Big Banks increasingly struggled to meet capital requirements. The capital coverage still reached 105.7% in 1957, but fell below the 100% capital requirement to 95.5% in 1958 for the first time. The low point was reached with a capital coverage ratio of 84% in 1960, meaning that the

[536] Eidgenössische Bankenkommission, *Jahresbericht 1980 der Eidgenössischen Bankenkommission* (Bern, April 1981), p. 5.
[537] In German, the ratio was called ‘Eigenmitteldeckungsgrad’.
[538] Swiss National Bank, ‘Das Schweizerische Bankwesen 1952’ (Orell Füssli, 1953).
[539] See footnote 540.

banks lacked 16% of the required capital. The ratio then recovered in the 1960s, only to drop below the minimum capital requirement once more in 1971 (93.0%). It was only in the 1980s that the Big Banks managed to improve their capital coverage to above the minimum threshold.

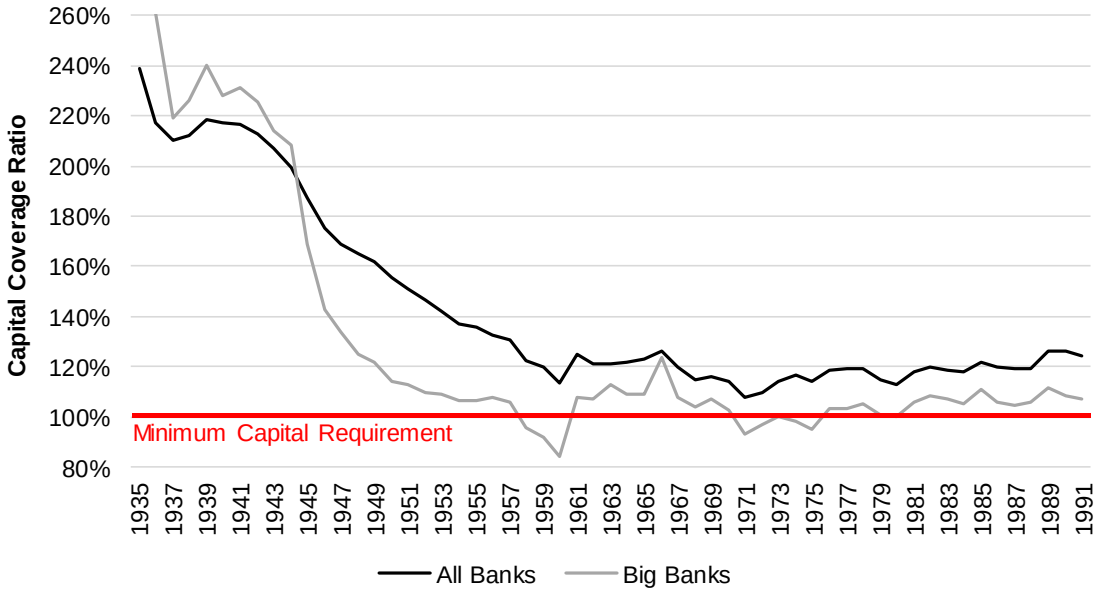

Figure 26: Capital Coverage Ratio (Regulatory Capital vs. Required Capital), All Banks and Big Banks in Switzerland, 1935-1991[540]

6.2.3. The Influence of Banks on the Evolution of Banking Regulation

The data shown in Figure 26 indicates that most banks fulfilled the capital requirements. However, the capital coverage ratio of the Big Banks also indicates that at least some of the Big Banks did not meet capital requirements for several years. The Federal Banking Commission discussed the capitalisation of banks in its annual reports to the Federal Council. These reports provide insights into which banks failed to meet capital requirements.

[540] Calculations and data: 1935-1949: Author's calculations and estimates based on balance sheet data of bank groups, taking into account collateralised loans and government securities. It was assumed that 80% of the loans to customers were collateralised. For the calculation of the regulatory capital, the Banking Ordinance of 1935 allowed also the use of municipal guarantees and 50% of unpaid capital. It was assumed that these two forms of capital contributed 1% to the regulatory capital (assumption based on data from the 1960s, for which the detailed disaggregated capital is available). 1950-1989: Author's calculation. Data on investments in (respectively loans to) the Federal government, the Federal Railway, Cantons, and municipalities were used to adjust for a lower capital requirement for these assets. Data: Swiss National Bank, *Die Banken in der Schweiz (annual issues 1906-2015)*.

The number of non-compliant banks did not change significantly over time. What changed, however, was the relevance of the banks concerned. In 1959, the Federal Banking Commission granted eleven approvals to Raiffeisen banks, savings banks, and one Cantonal bank. Besides these banks, the Union Bank of Switzerland and the Swiss Bank Corporation also failed to meet capital requirements.[541] At the beginning of the 1960s, Credit Suisse failed to meet capital requirements too.[542] This gap in the capital requirements meant that the three biggest financial institutions in Switzerland lacked capital from a regulatory point of view. Measured in total assets, the three banks represented about a fourth of Switzerland's banking market.[543]

Such a situation triggers a reaction from a banking supervisor. Theoretically, a non-compliant bank may be forced to terminate its businesses and be liquidated or sold. Alternatively, the bank may continue its business by 1) issuing new shares, 2) restructuring (e.g. reducing the total of assets), 3) being granted an exceptional approval for not complying with the regulatory standards, 4) or the regulation is changed altogether, and the capital requirements lowered. In the Swiss case, apart from divesting and reducing the balance sheet sizes, all these alternative options were used.

The Swiss banks frequently sold new shares to their shareholders. The Union Bank of Switzerland increased its paid-up capital in 1959, 1961, 1962, and 1965. Within seven years, the paid-up capital had doubled. Credit Suisse issued fresh capital in 1961, 1963, and 1965. The Swiss Bank Corporation raised its nominal capital in 1961, 1963, and 1966. The Federal Banking Commission also frequently granted exceptional approvals for non-compliant banks based on the Banking Act (Art. 23, 3d). In the long run, however, the capital requirements were further eased through lower capital requirements and broader definitions of capital, as shown in Section 6.2.2. Naturally, non-compliant banks have a distinct interest in their regulatory framework. What was the role of the banks in the regulatory changes which took place from the 1960s to the 1980s?

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[541] Eidgenössische Bankenkommission, *Geschäftsbericht der Eidgenössischen Bankenkommission an den Bundesrat für das Jahr 1959* (Bern, 1960), Swiss Federal Archives, E6520A#1983/50#62*.

[542] Eidgenössische Bankenkommission, *Eigene Mittel der Grossbanken. Notiz an Mitglieder der Eidg. Bankenkommission* (Bern, 21 March 1963), Swiss Federal Archives, E6520A#1983/50#48*.

[543] In 1960, the three banks had a cumulated balance sheet total of around CHF 5bn. For detailed figures, see: Swiss National Bank, 'Das Schweizerische Bankwesen 1960' (Orell Füssli, 1961), p. 240ff.

In fact, the regulatory changes outlined above were made upon requests from banks. Besides the Big Banks, the Swiss Bankers Association (SBA) as a representative body for banking interests lobbied for the continuous development of the banking legislation. The Bankers Association had been established in 1912. One of its goals was to coordinate and promote banking interests domestically and abroad. Since then, it had become one of the most influential business interests' associations in Switzerland. The Bankers Association also had well-established connections on political and administrative levels. Members of the Bankers Association were frequently present in extra-parliamentary commissions.[544] These commissions complemented the administration, providing expert knowledge. There were also links between the Bankers Association and the Swiss National Bank. Several board members of the Bankers Association were also members of the Swiss National Bank's 'Bank Council', while some were even members of the 'Governing Board'.[545]

The first requests to lower the capital requirements were brought to the Federal Banking Commission by the Swiss Bank Corporation in 1955 and 1956. A second attempt was made in 1957 by the group of the Big Banks together with the Swiss Bankers Association. The banks and the Bankers Association suggested that hidden reserves should be

[544] Thomas David and others, 'Networks of Coordination: Swiss Business Associations as an Intermediary between Business, Politics and Administration during the 20th Century', *Business and Politics*, 11.4 (2009), 1–38.
For an overview of networks between individual banks and other firms, see also: Youssef Cassis and Fabienne Debrunner, 'Les élites bancaires suisses, 1880–1960', *Schweizerische Zeitschrift für Geschichte – Revue suisse d'histoire – Rivista storica svizzera*, 40 (1990), 259–73. André Mach and others, *Les élites économiques suisses au XXe siècle*, Collection Focus (Neuchâtel: Editions Alphil-Presses universitaires suisses, 2016), XIV. Thomas David, Stéphanie Ginalski, and André Mach, 'From National Cohesion to Transnationalization: The Changing Role of Banks in the Swiss Company Network, 1910-2010', in *The Power of Corporate Networks: A Comparative and Historical Perspective*, ed. by Thomas David and Gerarda Westerhuis, Routledge International Studies in Business History (New York: Routledge, 2014), pp. 107–24. Gerhard Schnyder and others, *The Rise and Decline of the Swiss Company Network during the 20th Century* (Lausanne: Travaux de Science Politique, Université de Lausanne, 2005).
[545] The following persons were members of the SBA and SNB bank council (in chronological order): Mauderli Fridolin, Frey Julius, Waldkirch von-Bock Oskar, Sarasin-Iselin Alfred, Bersier Henri, Kurz Hermann, Curchod Gustave, Barbey-Gampert Edmond, Gautier-Fatio Victor, Speich-Jenny Rudolf (Thomas), Gisling Alfred, Leemann Eduard, Schaefer-Hunziker Alfred, Givel Roger, Generali Claudio, Studer Fritz, Gysi Alfredo. The following persons were members of the SBA and the SNB Governing Board: Hirs Alfred, Lusser Markus, Blattner Niklaus. Jöhr Adolf was even a member of the SNB Governing Board (1915-1918), the SBA (1920-1939), and the SNB bank council (1939-1951). For an analysis of links between the SBA and SNB, see also Sancey, *Quand les banquiers font la loi*.
Data: Université de Lausanne, Faculté des sciences sociales et politiques, 'Observatoire des élites suisses (OBELIS)', *Données* <http://www.unil.ch/obelis/home.html>.

counted as part of the regulatory capital and that the required ratio for liquid assets should be lowered.[546]

The banks used a range of arguments to convince the Federal Banking Commission to broaden the definition of capital. The General Directors of the Big Banks argued that their business activities had changed strongly in the last couple of years: large-scale industrial investments had become less relevant, their foreign exposure had become more diversified, and overall, they were developing more towards deposit banks. Furthermore, they argued that liquid assets especially were mostly risk-free, and regulation should take this into account. Overall, the proposed changes would, according to the bank managers, not affect the protection of creditors, and the lower risk would justify lower capital requirements.[547] The General Director of Credit Suisse argued that 'the solid tradition, with which the banks are run, leads to safety buffers that would allow a more liberal regulation'.[548]

The banks also argued that the high growth rates of the balance sheet totals caused by foreign capital inflows in the previous years might not be sustainable. Thus, balance sheets might contract again, leaving banks overcapitalised.[549] Finally, comparisons to foreign competitors were also often used. The General Director of the Union Bank of Switzerland, for example, highlighted that 'the high share capitals of the Swiss banks have proven their worth but are also their most expensive source of capital. Besides, the Swiss dividend rates for bank shares are far below the foreign dividend.'[550]

During the 1930s and 1940s, the position of the Federal Banking Commission had been that the capital requirements were generally too low. The Commission even proposed to the Federal Council that the Banking Ordinance should be revised, and minimum capital,

[546] Eidgenössische Bankenkommission, *Anrechnung stiller Reserven als eigene Mittel. Notiz betr. die Anrechnung stiller Reserven als eigene Mittel vom 11.12.1963.* (Bern, 11 December 1963), Swiss Federal Archives, E6520A#1983/50#49*. Eidgenössische Bankenkommission, *Vorschriften über eigene Mittel. Protokoll der Sitzung vom 20. Januar 1958 zwischen Bankenkommission und Vertretern der Banken* (Bern, 20 January 1958), Swiss Federal Archives, E6520A#1983/50#48*.
[547] Eidgenössische Bankenkommission, *Protokoll 1958, SFA, E6520A#1983/50#48**, pp. 11–18.
[548] Eberhard Reinhardt, General Director of Credit Suisse. Eidgenössische Bankenkommission, *Protokoll 1958, SFA, E6520A#1983/50#48**, p. 16.
[549] Samuel Schweizer, General Director of Swiss Bank Corporation. Eidgenössische Bankenkommission, *Protokoll 1958, SFA, E6520A#1983/50#48**, p. 14.
[550] Alfred Schäfer, General Director Union Bank of Switzerland. Eidgenössische Bankenkommission, *Protokoll 1958, SFA, E6520A#1983/50#48**, p. 11.

as well as liquidity requirements, increased.[551] The tightening of the requirements failed because 'no agreement with the interested banking groups could be reached', according to a former Head of the Secretariat of the Federal Banking Commission.[552]

The view of the Federal Banking Commission had changed in the 1950s. Considering the proposals made by the Bankers Association and the Big Banks, the Commission drafted a revised Ordinance and submitted it for consultation to the Swiss National Bank in 1958 and the Swiss Bankers Association in 1959.[553] The proposed legislation was then discussed in a conference between the Federal Banking Commission, the Swiss National Bank, the Swiss Bankers Association, and representatives of the Big Banks in December 1959.

The most crucial change in the draft of the Banking Ordinance was that the Federal Banking Commission would be responsible for setting the percentage of hidden reserves that could be used as regulatory capital. The question discussed in the meeting of the interest groups was where to set the limit on the use of hidden reserves. The Swiss National Bank had opposed the extensive use of hidden reserves for regulatory purposes. The Big Banks wanted to use as many hidden reserves as possible. Interestingly, although hesitant at first, the Federal Banking Commission sided with the Big Banks. The representatives of the Commission argued that the Big Banks had struggled to fulfil capital requirements for some time and that if there were no change in regulation, the Commission would have to continue granting exceptional approvals for non-compliance with the capital requirements. The meeting between the various interest groups in 1959 led to the compromise that 15% of the required capital could be composed of hidden reserves.[554]

According to the Federal Banking Commission, the 15% rule was meant to be a temporary exception to support some undercapitalised Big Banks. This temporary solution, in the view of the Federal Banking Commission, would prevent even bigger capital issuances. The Commission was aware that the need for further capital was

[551] Eidgenössische Bankenkommission, *Geschäftsbericht der Eidgenössischen Bankenkommission an den Bundesrat für das Jahr 1939* (Bern, 25 April 1940), pp. 3–4, Swiss Federal Archives, E6520A#1983/50#62*.
[552] Robert Reimann, *Kommentar zum Bundesgesetz über die Banken und Sparkassen*, 3. Auflage (Zürich: Poly. Verlag, 1963), pp. 12–13. Robert Reimann was the Secretary of the Federal Banking Commission.
[553] Eidgenössische Bankenkommission, *Notiz Anrechnung stiller Reserven, SFA, E6520A#1983/50#49**.
[554] Reimann, *Kommentar zum Bundesgesetz über die Banken und Sparkassen*, p. 13.

mainly driven by the large inflows of foreign capital to the Big Banks.[555] The effect of the regulatory change in 1961 on the capital coverage ratio was striking. Down at 84% in 1960, the ratio of the Big Banks grew to 108% in 1961 (see Figure 26). About half of this increase came from the use of hidden reserves. Archival material indicates that the Big Banks used at least CHF 104m of hidden reserves for regulatory purposes in 1961.[556] The rest of the change in the capital coverage ratio can be attributed to capital issuances by the Big Banks (CHF 95m) in the same year. From a regulatory point of view, the banks were suddenly substantially better capitalised.

The cycle of proposals from the banks to the supervisor leading to a compromise that eased the regulation of capital was repeated several times in later years. A first request to use more hidden reserves by the Union Bank of Switzerland in 1963 was declined.[557] In 1967, however, the Swiss Bankers Association asked for an increase of the hidden reserves allowed for regulatory purposes to 30%. The Federal Banking Commission confirmed a 'benevolent' consideration of the Bankers Association's proposal and decided – as a compromise – on 25%.[558]

In 1971 and 1972, the Banking Act and the Banking Ordinance were revised.[559] During the preparation of the Ordinance, a delegation of the Swiss Bankers Association bypassed the Federal Banking Commission and talked directly to Switzerland's Minister of Finance, Nello Celio. The Banking Commission was disappointed to have been excluded from these discussions, even more so as the Minister of Finance made various concessions. At this point, the Federal Banking Commission was clearly against a further weakening of the capital requirements. The experts' group of the Commission tasked with preparing a new Banking Ordinance suggested that a maximum of 80% of the

[555] Reimann, *Kommentar zum Bundesgesetz über die Banken und Sparkassen*, p. 13.
[556] Eidgenössische Bankenkommission, *Anrechnung stiller Reserven, SFA, E6520A#1983/50#49**.
[557] Eidgenössische Bankenkommission, *Verhandlungen der Eidgenössichen Bankenkommission vom 29. April, 1963* (Bern, 29 April 1963), Swiss Federal Archives, E6520A#1983/50#49*.
[558] Sekretariat der Eidgenössische Bankenkommission, *Brief des Sekretariats an die Mitglieder der Eidgenössischen Bankenkommission, Bankenkammer. Betrifft Anrechnung stiller Reserven als eigene Mittel / Abänderung der Verfügung vom 30.08.1961.* (Bern, 8 December 1967), Swiss Federal Archives, E6520B#2007_62#239.
[559] *BankG 1971*. *Vollziehungsverordnung zum Bundesgesetz über die Banken und Sparkassen vom 17. Mai 1972*, 1972.

regulatory capital could be hidden reserves. The Minister of Finance, however, decided to allow the unlimited use of hidden reserves.[560]

Publicly, the government argued that the revisions of the Banking Act and the Banking Ordinance in 1971 increased the liquidity and solvency requirements.[561] Both changes were undertaken against the background of the internationalisation of the Swiss financial centre. The revised Banking Ordinance required a minimum capital of CHF 2m for the foundation of a bank (this was meant by the 'stricter' capital requirements). The requirement targeted mainly new market entrants – many of them foreign institutions. Established banks in Switzerland, however, were not affected by this change.

The stricter liquidity requirements were the result of growing criticism of the large-scale foreign investments of the Big Banks. In the consultation process for the new Banking Act, the Social Democrat Party as well as the Workers Union had voiced their concerns that foreign investments – specifically referring to the Euromarkets – had increased the risks of the banks. The Federal Council shared this opinion, commenting that 'the increasing shift of liquidity from the domestic to the foreign market cannot be denied and poses a number of risks' and therefore suggested that the liquidity requirements should be increased.[562]

In 1981, capital regulation in the Banking Ordinance was revised again.[563] For the first time, subordinated debt was allowed to be counted as part of the regulatory capital. The banks had already been attempting to introduce such a change for several years.[564] It was also the first time that Switzerland moved to a capital adequacy model that exclusively focused on the asset risk.[565] The assets were differentiated according to 15 different categories, and each category was matched with a capital requirement ratio. The underlying idea was the same as in the Basel I framework that was introduced in

[560] Sekretariat der Eidgenössischen Bankenkommission, *Bericht an die Mitglieder der Eidgenössischen Bankenkommission betr. Revision der Vollziehungsverordnung* (Bern, 16 February 1972), Swiss Federal Archives, E6520A#1983/50#49*.
[561] See for example the statement of the Federal Council on the revision of the Banking Act: Bundesrat, 'Botschaft des Bundesrates an die Bundesversammlung über die Revision des Bankgesetzes', *Bundesblatt*, 10570, 1.24 (1970), 1144–1203.
[562] Bundesrat, *Botschaft des Bundesrates an die Bundesversammlung über die Revision des Bankgesetzes*, p. 1169.
[563] Another relevant change due to the Banking Ordinance was the use of consolidated balance sheets. *Vollziehungsverordnung zum Bundesgesetz über die Banken und Sparkassen vom 1. Dezember 1980*, 1981.
[564] Eidgenössische Bankenkommission, *Jahresbericht 1978 der Eidgenössischen Bankenkommission* (Bern, April 1979), p. 13.
[565] Eidgenössische Bankenkommission, *Jahresbericht 1980 der Eidgenössischen Bankenkommission*, p. 5.

Switzerland in 1991 and 1994.[566] The application, however, was different. Basel I used risk-weights for each asset category and multiplied the risk-weighted assets with 8%. The Swiss approach in 1981 assigned a capital requirement ratio to each asset category (instead of a risk-weight). Despite this, when the Basel I requirements were introduced into Swiss banking legislation ten years later, they did not bring fundamental changes. Subordinated debt, hidden reserves and hybrid capital instruments could already be partially credited as Tier 2 capital. In addition, taking into account off-balance-sheet items was not an innovation, but rather a development of the existing framework.

Were all these regulatory changes relevant to the Big Banks? Figure 27 shows the structure of the regulatory capital used by the Big Banks from 1970 to 1995. There is no data available for the period before 1970. In the first half of the 1970s, the hidden reserves were even bigger than the paid-up capital. By 1974, for example, the hidden reserves held by the Big Banks were CHF 2.2bn, while the paid-up capital was CHF 1.9bn. Thus, the inclusion of hidden reserves as part of the regulatory capital was fundamental. Similarly, the relevance of subordinated debt grew over time. By 1994, the paid-up share capital of the Big Banks was CHF 9.4bn; the subordinated debt was CHF 11.1bn. Finally, it is also important to note that the largest part of the regulatory capital was disclosed reserves, and not paid-up share capital.

The broadening of the capital definition led to fundamental changes in the structure of the regulatory capital. What would have been the effect on the group of the Big Banks if the capital requirements had not changed? Based on the available equity capital in each year, the maximum balance sheet total of the Big Banks can be estimated according to the Banking Act and Ordinance of 1934/1935. This theoretically possible (maximum) balance sheet total can then be compared with the actual balance sheet total.

[566] The revision of the Banking Ordinance in 1990 harmonised the risk classifications of Swiss legislation and the Basel Accord. In 1994, the capital requirements were changed from a direct to an indirect model. Until then, different requirements ratios were used for the risk classes. After 1994, the risk classes were weighted according to the Basel Accord and then multiplied with the requirement ratio of 8%. *Vollziehungsverordnung zum Bundesgesetz über die Banken und Sparkassen*, 1990; *Vollziehungsverordnung zum Bundesgesetz über die Banken und Sparkassen*, 1994; *Bundesgesetz über die Banken und Sparkassen*, 1994.

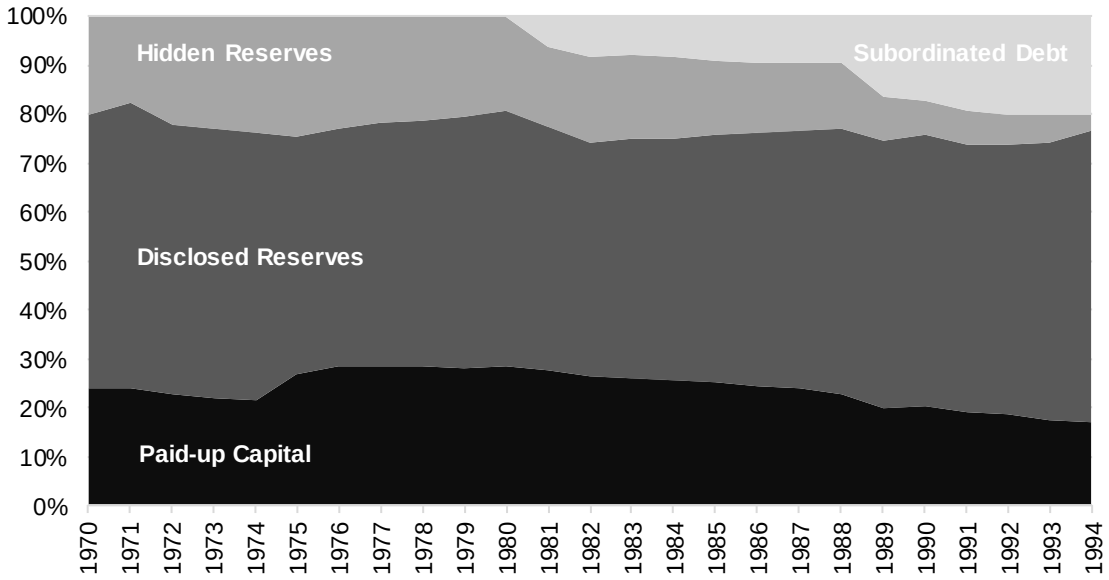

Figure 27: Structure of the Regulatory Capital, Big Banks, 1970-1994[567]

Figure 28 shows the deviation of the theoretical balance sheet total from the actual balance sheet total in each year. In 1950, for example, the existing capital resources would have permitted a balance sheet which was 27% higher than the actual balance sheet. In such a situation, the banks would have easily met the capital requirements as set in 1934/1935. The regulatory capital ratio did not restrict the growth of the balance sheet. The comparatively high level of capital resources until the first half of the 1950s is also mirrored by the capital coverage ratio presented in Figure 26.

In 1971, however, the balance sheet total would have had to be 35% lower if there were no adjustments in capital regulation.[568] Thus, the changes in capital regulation were relevant. If there had been no regulatory changes, it would have severely hampered the growth of the Big Banks and their national and international expansion. Instead, banks would have had to finance themselves internally through retained earnings or externally through more frequent capital issuances. The former would have necessitated lower dividend payments, the latter would have diluted the profits of existing shareholders.

This counterfactual view on capital requirements and the growth potential of the Big Banks underlines also one central argument made by the banks that was often put

[567] Author's calculations. The data was collected from: Eidgenössische Bankenkommission, *Anrechnung stiller Reserven, SFA, E6520A#1983/50#49**.; and various editions of: Swiss National Bank, *Die Banken in der Schweiz (annual issues 1906-2015)*.
[568] This assumes that all other parameters, such as pay-out ratios and profits, would not have been changed.

forward in negotiations with the Federal Banking Commission. Foreign capital inflows were an often-cited reason why capital regulation should be eased. These inflows certainly contributed to the large growth rates of the deposits and balance sheet totals. In 1960, the balance sheets of the Big Banks grew by 18.8%, in 1961 by 20.7%. An inflexible minimum capital ratio would have restricted such growth.

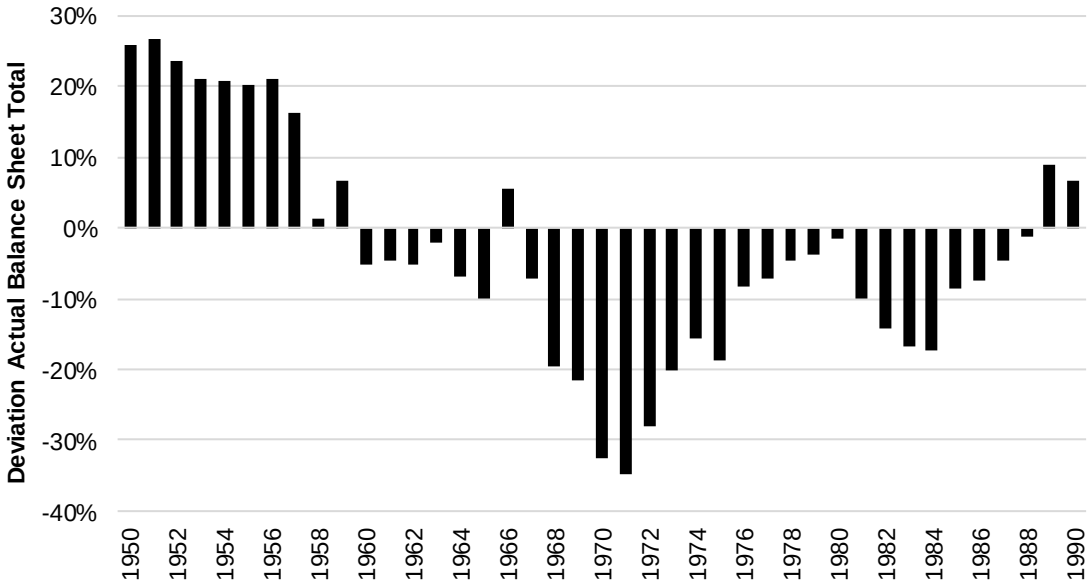

Figure 28: Counterfactual Analysis (Deviation of Balance Sheet Totals if Capital Regulation of 1934 Had Not Changed), Big Banks, 1950-1990[569]

6.2.4. Perspectives on Regulatory Changes

Despite the lobbying of the Big Banks, the change in capital requirements in the 1960s and 1970s is rather surprising, given Switzerland's macroeconomic context at the time. The Swiss National Bank was constantly fighting foreign capital inflows during these decades. It took defensive measures to limit the inflow of capital from abroad, for example by prohibiting investments and negative interest rates on the deposits of non-residents, as well as restricting borrowing abroad.[570] The Swiss economist Edgar Salin termed the state of the economy a 'Devisenbann-Wirtschaft' ('currency ban economy').[571] The assessment made of this period, which lasted until 1979, both by

[569] Author's calculations. See also footnote 540 for data sources and estimates.
[570] Bernholz, *Die Nationalbank 1945–1982*, pp. 127–43.
[571] Edgar Salin, 'Devisen-Bann-Wirtschaft: über die beginnende Anarchie im westlichen Währungssystem', *Kyklos*, 1964, 149–64.

economists and officially by the Swiss National Bank itself, is clear: the defensive measures by the Swiss National Bank were largely ineffective.[572]

One measure that might have been effective, however, was stricter capital requirements for the Big Banks. It is likely that stricter capital requirements would have acted as a brake for the balance sheet growth of undercapitalised banks, which was driven substantially by foreign capital flows. In retrospect, there might be two reasons why stricter capital rules were not considered as a tool for monetary policy.

Firstly, it was the Federal Banking Commission and various political actors (Federal Council, parliament) who could change the regulatory environment for banks (Banking Act / Ordinance / circulars). The Swiss National Bank attended conferences that discussed regulatory revisions but could only make recommendations. The archival material suggests that the Swiss Bankers Association and the Big Banks were much more closely involved in the regulatory process than the Swiss National Bank. The Federal Banking Commission acted more as a mediator between the interests of the banks and the Swiss National Bank than as an independent supervisory voice. Furthermore, the Federal Banking Commission was a weak supervisor until the revision of the Banking Act in 1971. Its enforcement mechanisms were – even in its own view – 'not sufficient'.[573] In case of non-compliance with the Banking Act, the Commission could make either a criminal complaint to the Cantonal prosecution authorities or fine the bank. The handling of such complaints, however, would often take years and reach the statutes of limitations. The Federal Banking Commission also had little success with regulatory fines, as the maximum amount was too low (CHF 20.000).[574] The ultimate threat for a bank, withdrawal of the banking licence, was only possible after 1971.

Second, the Swiss National Bank had to strike its own bargain with the Big Banks and the Swiss Bankers Association. Many measures to reduce foreign capital inflows were based on Gentlemen's Agreements – for example in 1950, 1955, 1960, 1962, 1975, 1976 – negotiated through the Swiss Bankers Association.[575] The Swiss National Bank

[572] Kurt Schiltknecht, 'Beurteilung der Gentlemen's Agreements und Konjunkturbeschlüsse der Jahre 1954-1966: Unter besonderer Berücksichtigung der Auslandgelder' (ETH Zürich, 1970), p. 127ff; Swiss National Bank, *75 Jahre Schweizerische Nationalbank, 1907-1982*, p. 102; Bernholz, *Die Nationalbank 1945–1982*, p. 123.
[573] Eidgenössische Bankenkommission, *Jahresbericht 1984 der Eidgenössischen Bankenkommission* (Bern, April 1985), p. 12.
[574] Eidgenössische Bankenkommission, *Jahresbericht 1984 der Eidgenössischen Bankenkommission*, p. 12. See Art. 46, *BankG 1934*.
[575] See the chronicle of monetary and exchange rate policies by the SNB in: Swiss National Bank, *75 Jahre Schweizerische Nationalbank, 1907-1982*.

depended on the cooperation of the banks for these measures. Overall, the regulatory changes in the 1960s and 1970s were clearly in the interest of the banks, and the banks took part in shaping their regulatory environment.

Publicly, the regulatory changes and the non-compliance of the major Big Banks with the capital requirements were noted, but did not trigger a public debate on the topic. The revision of the Banking Ordinance in 1961, which was a crucial technical change with a significant impact for the growth of the Big Banks, received little public attention. The *Neue Zürcher Zeitung*, for example, simply described the regulatory changes or the capital ratios of the banks, without further comments.[576] The banks themselves were also silent about their struggle to meet capital requirements at their annual meetings.[577]

The interest of banks in developing the regulatory environment certainly persisted also in the 1980s. However, the changes mainly followed trends that were already apparent on an international level. Risk-weighted approaches to measuring capital adequacy were already being discussed at the beginning of the 1970s on a European level and later in the BCBS. Switzerland took part in the negotiations in the BCBS. In this context, the introduction of the Swiss framework in 1981 is not surprising. Moreover, as will be shown in the next sections, the use of subordinated debt for regulatory purposes came into fashion too, and one of the biggest proponents for that was the United Kingdom.

[576] Neue Zürcher Zeitung, 'Keine Revision des Bankengesetzes: Eine neue Vollziehungsverordnung', *Abendausgabe Nr. 3162* (Zürich, 30 August 1961), p. 13; Neue Zürcher Zeitung, 'Das schweizerische Bankwesen im Jahre 1961' (Zürich, 15 January 1963), p. 14.
[577] Neue Zürcher Zeitung, 'Schweizerischer Bankverein' (Zürich, 24 February 1959); Neue Zürcher Zeitung, 'Generalversammlung der Schweizerischen Bankgesellschaft' (Zürich, 9 March 1963).

6.3. From Informal to Formal: The Regulation and Supervision of Banking and Capital in the United Kingdom

Britain's approach towards banking regulation and supervision was different to that in Switzerland and most other continental European countries. On the regulatory side, there was not one single piece of legislation regulating the financial system and its players. Instead, several Acts evolved after the 1940s that affected specific areas of the financial system. This fragmented regulatory system was, to some extent, reunified by the Banking Act of 1979.[578] On the supervisory side, banking supervision was conducted by the Bank of England without a legal mandate.

In the 1960s and 1970s, the evolution of the domestic and international financial environment charged the British regulatory and supervisory system with tension. The emergence of the Eurodollar markets from the 1950s led to the rebirth of the City of London as an international financial centre.[579] On a domestic level, there were mergers again for the first time in four decades, a wholesale market for the borrowing and lending of large deposits between financial institutions developed and with that, the secondary banks emerged. Moreover, politically, there was a desire for more competition within the financial system.

It was a crisis that brought the various evolutions to a halt. The secondary banking crisis in 1973/1974 paved the way towards a reconsideration of both regulation and supervision. It triggered a review of the financial system (the Wilson Committee) and also a series of joint working papers by the Bank of England and the clearing banks on supervision, capital adequacy and liquidity.

What were the consequences of these developments for the regulation of capital? The impact was small: the Banking Acts of 1979 and 1987 stated that the capital should be 'appropriate'. Determining capital adequacy was left to the Bank of England, which was already the case before and after the introduction of the Banking Acts. Nonetheless, relevant changes took place from the 1960s to the 1980s. A framework on how to measure capital emerged in the form of a risk-adjusted model. This framework was the result of discussions between the Bank of England and the clearing banks. The guiding ratio used to assess solvency in supervisory practice changed from the 'free resources

[578] *Banking Act 1979*.
[579] Cassis, *Capitals of Capital*, pp. 223–25.

ratio' to the 'risk assets ratio'. Another driving factor was the trend towards the harmonisation of capital and liquidity requirements on a European and international level. The following sections trace the evolution of capital regulation and the role of supervision in the United Kingdom.

6.3.1. The Irrelevance of Capital: 1945 to 1973

From the 1920s to the 1970s, capital in banking was only an issue of secondary importance in the United Kingdom. In 1918, the topic received significant public exposure for the last time. Discussions surrounding the amalgamation movement increased public attention and created political pressure. The banks raised fresh capital after the First World War (see Section 5.2.3). During the interwar period, the question of capital adequacy was of little importance, most likely because the British banking system went through this period without entering a crisis. The stability of the banking sector was never publicly questioned.[580] Moreover, it was often believed that this stability was rooted in high liquidity requirements (see Section 5.2.4).

The irrelevance of capital was emphasised by the reports of several parliamentary Committees. In 1929, the Committee on Finance and Industry, known as the Macmillan Committee, investigated the reasons for the depressed British economy.[581] The Committee also analysed joint-stock banks. Even though the liability side of the banks' balance sheets was discussed, equity capital as a source of funding that influences the structure of the asset side was disregarded.[582] The final recommendations concerning joint-stock banks focused entirely on liquidity ratios and the control of credit supply by the Bank of England's policy on reserve ratios.[583]

Another Committee was appointed in 1957 to investigate Britain's monetary policy during the 1950s.[584] The Radcliffe Committee discussed the background of the monetary policy,

[580] Malcolm George Wilcox, 'Capital in Banking: An Historical Survey', in *UK Banking Supervision*, ed. by Edward P.M. Gardener, Reprint of an Article in the Journal of the Institute of Bankers, June 1979 (London: Allen & Unwin, 1986), pp. 205–17 (p. 210).
[581] Committee on Finance and Industry (Macmillan Committee), 'Committee on Finance and Industry (Macmillan Committee): Report of Committee', 1931, The National Archives, T 200/7.
[582] Committee on Finance and Industry (Macmillan Committee), *Committee on Finance and Industry, BNA, T200/7*, p. 37.
[583] Committee on Finance and Industry (Macmillan Committee), *Committee on Finance and Industry, BNA, T200/7*, pp. 33ff, 152ff.
[584] Committee on the Working of the Monetary System (Radcliffe Committee), *Committee on the Working of the Monetary System: Report of Committee* (London: Her Majesty's Stationary Office, 1960).

the work and organisation of the Bank of England, as well as the role of the banks in the economy. In the context of banking, the Committee analysed the macroeconomic importance of deposits, advances, and overdrafts. The topic of capital in banking was – once again – neglected. Discussing liquidity, the Committee concluded that the 30% liquidity ratio that was followed by the banks in the 1950s was probably too high.[585]

The 1950s and the Low Point in Capital Ratios

Capital in banking did not even become a pressing topic once the capital/assets ratio of British banks hit a historical low point of 2.4% in 1953. The background for this drop in the capital levels was the interest rate hikes of the 1950s. From 1932 to 1950, the Bank Rate had been at 2%. The interest rate was raised to 7% in 1957, which in turn put market prices for government securities under pressure. As government papers still contributed about half of the total assets on the banks' balance sheets at the time, the falling market prices translated into heavy losses for banks. Moreover, the ability of the banks to build up reserves through retained profits was severely restricted. The earnings of the banks on advances were low due to the Bank of England's credit control.[586] As shown in Section 5.2.4, the banks wanted to increase their capital at the time. The Bank of England – prioritising monetary policy – declined these requests until 1958.

Figure 29 shows the capital/assets ratio of British banks from 1940 to 1990. The impact of the capital issuances after 1958 was substantial. The capital assets/ratios almost doubled between 1957 and 1965 to 5%. Figure 30 displays the capital structure of the Big Five Banks from 1940 to 1973, illustrating the build-up of the nominal capital over time. The jump in the capital/assets ratio in 1969 was due to the legal disclosure of hidden reserves. A closer look at the balance sheets of the Big Five reveals that the total reserves grew by £480m in 1969, which was equivalent to almost 3% of the banks' total balance sheets. The increase in public reserves can be attributed almost exclusively to hidden reserves, as shown by the archival research of Billings and Capie.[587]

[585] The liquid assets consisted of cash, call money and bills and were measured as a percentage of the deposits. 8% of customers' deposits were held as deposits at the Bank of England. Cash in tills and vaults was also considered as 'cash'. Another 6.5% to 9% was usually at call at the discount market. The rest was usually held as bills, a small portion in commercial bills and a larger amount in government bills. Committee on the Working of the Monetary System (Radcliffe Committee), *Committee on the Working of the Monetary System: Report of Committee*, para. 147.
[586] Wilcox, *Capital in Banking: An Historical Survey*, p. 211. For an overview on profitability in banking, see also: Capie and Billings, *Profitability in English Banking*.
[587] Billings and Capie, *Capital in British Banking*.

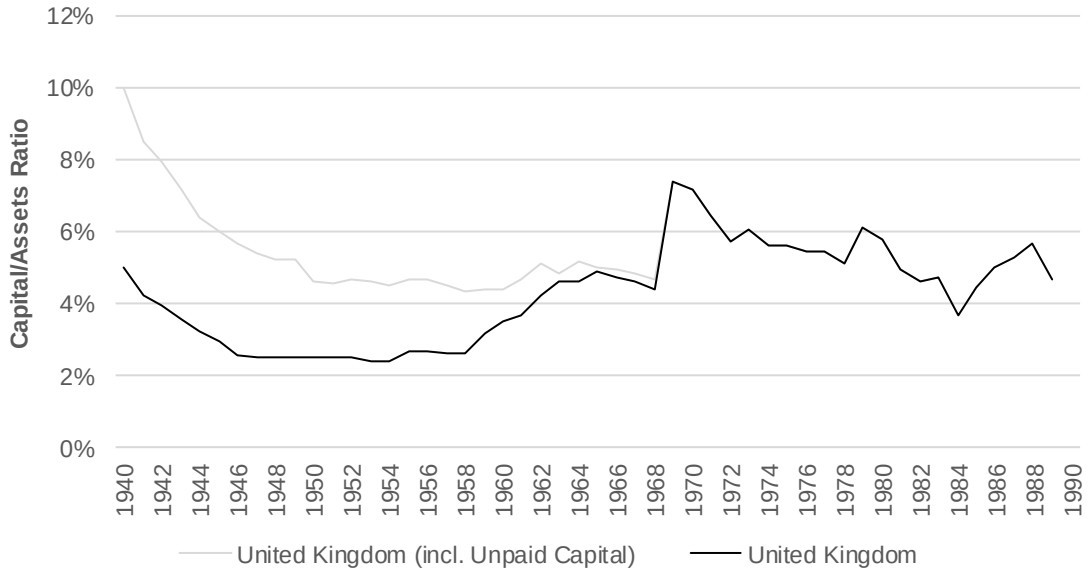

Figure 29: Capital/Assets Ratio, United Kingdom, 1940-1990[588]

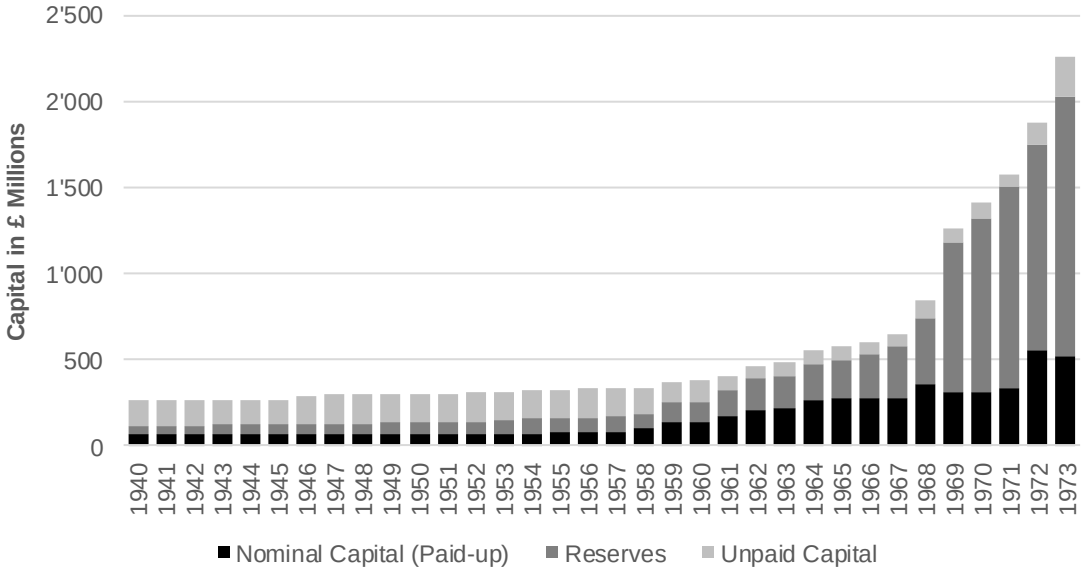

Figure 30: Paid-up Capital, Reserves and Unpaid Capital in £ Millions, Big Five Banks, 1940-1973[589]

[588] Data United Kingdom: 1880-1966, Sheppard, *The Growth and Role of UK Financial Institutions*.; 1967-1978: Data obtained from individual annual reports of Big Four/Big Five due to lack of data availability in official statistics; 1979-1983, clearing banks: Revell, *Costs and Margins in Banking: Statistical Supplement*.); 1984-2008, all banks: OECD, *Income Statement and Balance Sheet Statistics*.)

[589] Author's calculations. Data obtained from individual balance sheets of Barclays, Lloyds, Midland, National Provincial, and Westminster. The data is only shown until 1973 to illustrate the build-up of capital in the 1960s. The full data until 1990 is available.

Fragmented Banking Regulation Until 1979

Until 1979, the Bank of England maintained its traditional role as an informal banking supervisor. Technically, the Bank of England Act of 1946, which nationalised the Bank of England, gave it the power to issue directives to banks.[590] This measure, however, was never used.[591] The regulation of financial institutions was based on a mixture of statutory and non-statutory regulations. The Bank of England distinguished between two types of non-statutory regulation. Self-regulation was based on following commonly accepted guidelines set up by institutions or a group of institutions. The other form of non-statutory regulation was the exercise of authority over financial institutions – a role which was derived from its role and responsibilities as a central bank.[592]

On the statutory side, a system often referred to as the 'ladder of recognition' emerged. The status of a bank depended on the level of recognition that it received. The Bank of England viewed the various recognitions as 'status ladder', through which banks could 'progress as their reputation and expertise developed.'[593] Climbing the ladder of recognition and becoming a fully authorised bank of the highest standing took between about eight to fifteen years.[594] The complex web of regulations also had implications for the capital of banks.

The recognitions were based on lists that were related to the respective acts. The Exchange Control Act 1947 tasked the Bank of England with maintaining a list of banks that were authorised to deal with foreign exchange.[595] Thus, these banks were referred to as 'authorised banks'. The Companies Act 1948 created a list of banks that were allowed to have hidden reserves.[596] These banks were the 'Schedule 8' banks and were perceived as banks of the 'highest standing'.[597]

There were also other acts applicable to banks, such as the Prevention of Fraud (Investments) Act of 1958 that stipulated a licence requirement for banks that wanted to

[590] *Bank of England Act 1946*, *9 & 10 Geo 6*, para. 4 (3).
[591] Blunden, *The Supervision of the UK Banking System*.
[592] Cooke, *Self-Regulation and Statute - the Evolution of Banking Supervision*, p. 90.
[593] Bank of England, 'Supervision of Banks and Other Deposit-Taking Institutions', *Quarterly Bulletin*, Q2 (1978), p. 383.
[594] Capie, *The Bank of England*, p. 597.
[595] *Exchange Control Act 1947*, 1947, c. 14.
[596] *Companies Act 1948*, 1948, c. 38.
[597] Blunden, *The Supervision of the UK Banking System*, p. 188.

deal with securities for customers.[598] The Protection of Depositors Act of 1963 prohibited the use of the term bank when advertising for deposits.[599] Initially, banks which were allowed to use 'bank' in advertising were the same as the 'Schedule 8' banks. In 1967, however, a section was amended in the Companies Act 1967 for banks exempted from the depositor protection legislation.[600] This created yet another list, the 'Section 127' banks. Another recognition was based on Section 54 of the Income and Corporation Taxes Act 1970, which allowed banks to pay and receive interest gross of tax.[601] Yet another recognition was based on the Companies Act in 1967, which allowed the Department of Trade to recognise institutions that conducted banking business ('Section 123' banks). There were also other minor forms of recognitions beside these laws, such as membership in the British Bankers Association, having obtained a clearing code from the Committee of London Clearing Banks, or being included in the Bankers Almanac.[602]

The large number of recognitions often came with certain requirements, some of them also in connection with capital. The Section 123 list, for example, required banks to hold capital of at least £250,000 and to conduct a range of banking services, such as issuing cheque books and offering current and deposit accounts. Inclusion in the Section 127 list required capital of £1m, offering a variety of banking services, having adequate liquidity and a good quality of management and a good reputation.[603] For the Big Five banks, these capital requirements in absolute terms (rather than ratios) were irrelevant, given their large capitals (see Figure 30).

A government department, the Department of Trade, was responsible for granting the legislative approvals for the various lists. The Bank of England as an informal supervisor, however, was always consulted when banks were added to the lists. It was in this role that the Bank of England monitored liquidity and solvency ratios and conducted regular interviews with the banks. The actual supervision was usually conducted in informal meetings between representatives of the bank and the Bank of England's Discount Office when banks submitted their accounts.[604]

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[598] *Prevention of Fraud (Investments) Act 1958*, *C. 45*. See also: Capie, *The Bank of England*, p. 591.
[599] *The Protection of Depositors (Accounts) Regulations 1963*, 1963.
[600] *Companies Act 1967*, 1967, c. 81.
[601] *Income and Corporation Taxes Act 1970*, *C. 10*. For a discussion, see: Edward P.M. Gardener, 'Supervision in the United Kingdom', in *UK Banking Supervision*, ed. by Edward P.M. Gardener (London: Allen & Unwin, 1986), pp. 70–81 (p. 72).
[602] Capie, *The Bank of England*, p. 598.
[603] Capie, *The Bank of England*, pp. 596–97.
[604] Bank of England, *Supervision of Banks and Other Deposit-Taking Institutions*.

The capital ratio used by the Bank of England during the 1950s was the 'ratio of free resources'. For liquidity purposes, the Bank of England observed the 'quick assets ratio'.[605] The minimum solvency and liquidity ratio that the Bank of England accepted could vary, depending on the type and standing of the bank. According to Jack Revell, Economics Professor at the University College of North Wales and one of the leading voices on the topic at the time, the 'ratio of free resources' ranged between 1:10 for newly established banks to 1:30 for discount houses. These ratios were not applied as target ratios in a strict manner but acted as signal that would alarm the supervisors.[606]

Given the complicated regulatory framework, it was not surprising that its complexity was about to be identified as a deficiency of the system. Moreover, as it turned out, the legislation failed to target new forms of financial institutions, the so-called secondary banks.

6.3.2. The Relevance of Capital: The Secondary Banking Crisis

The 1960s and 1970s were marked by structural change in Britain's banking sector, which had a lasting impact on competition, the market participants, and their balance sheets. After the Second World War, investments in government debt gradually lost importance. Towards the end of the 1950s, government investments were no longer the largest balance sheet item on the asset side. Advances became the most important asset item again for the first time since 1929.

The 1960s also brought about the first mergers in four decades. The National Provincial bank acquired the District Bank in 1962. In 1968, the Westminster Bank merged with National Provincial. In 1969, Martins Bank was acquired by Barclays. Moreover, the British clearing banks developed from domestic to international institutions within a few years and the number of international banks in London grew rapidly. The balance sheets of the clearing banks expanded by on average 8.9% p.a. during the 1960s and 20.0% p.a. in the 1970s.[607]

Domestically, policy changes aimed to replace the system of direct control by the Bank of England with market-guided mechanisms. The implementation of the 'Competition and Credit Control' (CCC) paper lifted many constraints on the banks in 1971, suggesting a

[605] Definition: Assets immediately realisable as a percentage of the deposits.
[606] Revell, *Solvency and Regulation of Banks*, p. 47.
[607] Author's calculations. Data: Individual annual reports.

new approach towards monetary policy.[608] Under the CCC policy, the clearing banks gave up their cartel, which had previously fixed the rates paid on deposits and set minimum rates for advances. In return, the clearing banks were allowed to enter the newly emerged wholesale market.[609] This allowed them to place funds and raise deposits at other banks, which had had to be done through subsidiaries before. Moreover, the paper suggested that the existing quantitative control of lending through cash and liquidity ratios should be replaced by a universal reserve ratio and adjustments in interest rates and open market operations.[610]

In contrast to the previous system of credit control, not only clearing banks, but all banks would be subject to reserve ratios. This meant that a new type of banks – the fringe banks – were to be affected by CCC as well. The Bank of England already considered that the fringe banks should be invited to adhere to a 10% reserve ratio. However, these attempts were halted by the advent of the secondary banking crisis in 1973.[611]

The fringe banks, also termed secondary banks, emerged in the late 1950s and early 1960s. These institutions borrowed on the wholesale market and lent mostly for properties. Both the fringe banks and the wholesale market grew rapidly during the period of expansionary monetary policy between 1971 and 1973.[612] Moreover, the fringe banks competed with the traditional clearing banks in the lending and deposits markets. During 1973 and 1974, falling housing prices put many smaller financial institutions under threat of bankruptcy and the Bank of England together with the London and Scottish clearing banks launched various rescue operations to stabilise the market.[613]

Several issues became apparent as a result of the secondary banking crisis, and some of them would affect the banking legislation to come. Firstly, many financial institutions were not supervised at all. There was only informal supervision of recognised banks by the Bank of England. Fringe banks and the foreign banks were out of the supervisory scope. With the secondary banking crisis, the ‘old’ system based on the informal control of a small number of clearing banks came to an end. Secondly, after a long period of

608 Bank of England, ‘Competition and Credit Control’, *Quarterly Bulletin*, Q2 (1971), 189–93.
609 The cartel emerged during the First World War. Turner argues that it ‘can be viewed as a quid pro quo to the banks’ in exchange for the acceptance of the Bank of England’s leadership in supervision. Turner, *Banking in Crisis*, p. 175.
610 See Capie’s chapter on CCC for an overview: Capie, *The Bank of England*, pp. 483–523.
611 Capie, *The Bank of England*, p. 599.
612 Capie, *The Bank of England*, p. 524.
613 Most famously the lifeboat operation. For a good overview of the secondary banking crisis, see for example: Margaret Reid, *The Secondary Banking Crisis 1973-75: Its Causes and Course* (London: Macmillan, 1982). Capie, *The Bank of England*, pp. 524–86.

financial stability, awareness of the importance of protecting depositors suddenly grew as a result of the crisis. Lastly, the system with the ladder of recognitions was too complex and therefore hard to understand for the public.[614]

During 1974 and 1975, it became clear within the Bank of England that new legislation was both 'inevitable and desirable', as Peter W. Cooke, at the time responsible for banking supervision at the Bank, noted.[615] The Bank of England also reorganised its system of supervision internally. Until summer 1974, the Discount Office had been responsible for banking supervision. As a result of the secondary banking crisis, a new supervisory office – the Banking Supervision Division (BSD) – was formed.[616]

As the protection of depositors was questioned, the topic of capital adequacy received attention as well. In 1974, the Bank of England created a working group to reconsider the purpose of capital, as well as discussing methods to assess capital adequacy and liquidity. The working group consisted of representatives of the London and Scottish clearing banks and officials from the Bank of England.

The working group published its results in a paper titled 'The Capital and Liquidity Adequacy of Banks' in 1975.[617] It was the first time since the First World War that the topic of capital had received wider public attention. Moreover, it was also a novelty for the Bank of England to discuss methods for measuring capital adequacy openly. Until 1975, capital adequacy had been part of the supervisory practice, but only discussed directly between banks and the Bank of England. The working paper described the existing approaches towards capital adequacy and showed in which direction capital measures were to be developed.

At this time, similar discussions on capital adequacy were also underway in the EEC. The United Kingdom joined the EEC in 1973 and, as Peter Cooke pointed out, tried to influence the debates on a European level towards their own interests.[618] With regards

[614] Blunden, *The Supervision of the UK Banking System*, pp. 189–90.
[615] Cooke, *Self-Regulation and Statute - the Evolution of Banking Supervision*, p. 88.
[616] In 1974, the supervisory part of the Discount Office consisted of 15 people. Until 1978, the number of people working for the BSD increased to about 70. Bank of England, *Supervision of Banks and Other Deposit-Taking Institutions*, p. 384.
[617] Bank of England, 'The Capital and Liquidity Adequacy of Banks', *Quarterly Bulletin*, Q3 (1975).
[618] Cooke, *Self-Regulation and Statute - the Evolution of Banking Supervision*, p. 89.: 'In the course of this process, the United Kingdom took a strong lead in redirecting the energies of the European Commission toward an approach to harmonisation in the banking field more consistent with the realities of the marketplace. An approach, we in the Bank believed, more

to capital adequacy, as will be seen in the following, the British definitions were already quite close to those established by the EEC.

The working paper of 1975 described two methods of assessing capital adequacy. The first approach was based on the 'free resources ratio', measuring the 'free capital resources' as a percentage of the liabilities. A second approach was the 'risk assets ratio'. This new approach related the riskiness of different asset categories to the amount of capital resources. According to the working group, cash and balances with the Bank of England, advances to (or guaranteed by) the United Kingdom's public sector, and advances to banks listed in the United Kingdom were regarded as risk-free. Thus, such assets would not require banks to hold capital.[619]

The working paper also defined capital. There were two types of capital. The 'free capital resources' were defined as capital minus the book value of infrastructure, also referred to as fixed assets. This definition was closely related to the idea of the purpose of capital at the time. Capital was perceived as necessary to cover fixed assets, and fixed assets were considered as the most illiquid asset, especially in times of crisis. The remaining amount of capital should 'protect depositors from losses as a result of business risks' and 'engender the confidence of potential depositors and trading partners'.[620]

A second form of capital, which was used to calculate the solvency ratios, was the 'capital resources'. Besides paid-up share capital and reserves, the 'capital resources' also included provisions and loan capital. This was a comprehensive definition of capital. Loan capital was medium to long-term subordinated debt. Although subordinated debt – in earlier years usually called 'loan stock' – ranks after any other debt in the case of a bankruptcy, it is hard to argue that it can serve as an actual loss absorber similar to equity capital.[621]

The inclusion of provisions as a part of capital is also debatable. One can argue that non-specific provisions are a form of capital, as they are comparable to general reserves and augmented by retained profits. Specific provisions, however, usually relate to an

likely in practice to lead to agreement because it was addressing major points of principle rather than detailed statutory provisions.'

[619] Bank of England, *The Capital and Liquidity Adequacy of Banks*, p. 241.

[620] Bank of England, *The Capital and Liquidity Adequacy of Banks*, p. 240.

[621] Malcolm G. Wilcox, a former President of the Institute of Bankers and Director of Midland Bank, argued in favour of treating subordinated debt as equal to equity capital. He commented that subordinated debt 'does ultimately stand between depositors and the disappearance of their funds, forming another line of defence which must be sacrificed before deposits are at risk.' Wilcox, *Capital in Banking: An Historical Survey*, p. 207.

expected loss and therefore do not serve as a general loss absorber. Yet both forms of provisions were defined by the working paper as being a part of capital resources. Thus, the working group opted for an all-encompassing definition of capital. There was no ratio discussed that included 'hard' capital, consisting of shareholders' funds and reserves alone.

Specific minimum standards for the two solvency ratios were purposely avoided. The working group argued that a quantification would reduce the flexibility to consider the different circumstances of individual banks. Nevertheless, it should be possible 'to develop over time broad numerical standards for the different groups of banks which may be used as yardsticks.'[622] Being the product of a joint working group by the Bank of England and the clearing banks, it is not surprising that much of the paper gives the impression of being a compromise. With regards to numerical capital requirements, the paper specifically states that 'the special position which the clearing banks occupy in the financial system is recognised.'[623] Nevertheless, it must be remembered that this approach towards capital adequacy was in keeping with the Bank of England's general principles and understanding of regulation and supervision at the time. It was flexible, avoiding rigid rules. It allowed that each bank was to be judged individually in a personal manner. And it was participative; the working paper in fact was an outcome of the Bank's participative approach.[624]

The working paper set the course for the perception of capital in the 1970s and 1980s. Subordinated debt was accepted as an essential part of the capital. In the Bank of England's statistical publications on the banking market, no differentiation was made between the various types of capital. Only the total capital resources were reported in the Bank's Quarterly Bulletins (see Statistical Annexes). The same applies to the international statistics provided by the OECD at the time.[625] For a detailed assessment of a 'narrowly-defined' capital base, one has to turn to the annual statements of individual banks.

Now that capital adequacy had finally emerged as a topic, was it viewed as an essential source of stability for British banks? Before the 1970s, the focus was clearly on liquidity,

[622] Bank of England, *The Capital and Liquidity Adequacy of Banks*, p. 240.
[623] Bank of England, *The Capital and Liquidity Adequacy of Banks*, p. 240.
[624] Blunden, *The Supervision of the UK Banking System*, p. 191.
[625] Jack Revell, *Costs and Margins in Banking: An International Survey*, ed. by Organisation for Economic Co-Operation and Development OECD (Paris: OECD, 1980); Revell, *Costs and Margins in Banking: Statistical Supplement*.

which was linked to the fact that credit control, or more broadly monetary policy, can be exercised through liquidity requirements. In 1975, George Blunden, at the time responsible for banking supervision at the Bank of England, still highlighted that 'liquidity is probably even more important than capital adequacy'. Blunden argued that the secondary banking crisis had been a liquidity problem, and not one of inadequate capital.[626] The developments in the working groups on a European and international level, however, seem to have shifted the focus from liquidity to solvency.

6.3.3. The Banking Acts in 1979 and 1987

By the mid-1970s, it was clear that British banking needed a new regulatory framework. The Banking Act was introduced in 1979 and represented the first legislation since the mid-19th century that specifically regulated banks. The previous regulation, based on general Companies Laws and several pieces of legislation affecting different areas of banking, was mostly replaced. With regards to bank capital, however, the new Act did not introduce specific capital ratios. The Banking Act was in the tradition of British banking supervision, leaving the Bank of England as a supervisor substantial discretionary flexibility.

The most important parts of the Act related to the authorisation and supervision of institutions which took deposits from the public. The Act was primarily concerned with one area of banking, which was deposit-taking. Other areas, such as foreign exchange, securities dealing, or payment services were left aside. All deposit-taking institutions had to be authorised by the Bank of England. The Act differentiated between 'licensed institutions' and 'recognised institutions'. Both types of institutions were allowed to take deposits. The main difference was the type of supervision. The Act ensured that the supervision of recognised banks could continue mostly on a non-statutory basis – as was already the case before.[627]

[626] Blunden, *The Supervision of the UK Banking System*, p. 193.
[627] For licensed institutions, the Banking Act established a series of information obligations. The Bank of England could make inquiries about 'the nature and conduct of the institution's business and its plans for future development'. *Banking Act 1979*, para. 16.

The Banking Act set minimum capital requirements of £250,000 for licensed institutions and £5m for recognised institutions.[628] There were no prescribed capital ratios, but a general statement on capital adequacy for licensed institutions:

> The institution […] will maintain net assets of such amount as, together with other financial resources available to it of such a nature and amount as are considered appropriate by the Bank, is sufficient to safeguard the interests of its depositors, having regard to the factors specified in subparagraph (2) below.[629]

Subparagraph 2 was defined as follows:

> The factors referred to in sub-paragraph (1) (a) above are (a) the scale and nature of the liabilities of the institution and the sources and amounts of deposits accepted by it; and (b) the nature of its assets and the degree of risk attached to them.[630]

The paragraph on solvency for recognised institutions was formulated in a similar way, but was slightly less detailed.[631] The Banking Act defined 'net assets' as paid-up capital and reserves. The definition of capital also opened the door for the use of other forms of capital, referred to as 'other financial resources'. In practice, this meant subordinated debt and guarantees from third parties.[632]

The Bank of England further detailed the capital adequacy regime in another joint working paper with the British Bankers' Association (BBA), which succeeded the Committee of London Clearing Bankers as a representative body in the discussions with the Bank. The paper, titled 'The Measurement of Capital', described the methods and criteria that the bank employed when assessing the capital adequacy of financial institutions and was published in 1980.[633]

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[628] The £5m applied to banks that were providing a 'wide range of banking services'. Banks that were offering 'highly specialised banking services' had to hold a capital of £250,000. *Banking Act 1979*, sch. 2, para. 5 & 9.
[629] *Banking Act 1979*, sch. 2, para. 10.
[630] *Banking Act 1979*, sch. 2, para. 10.
[631] The net assets and other financial resources had to be 'considered appropriate by the Bank' as well, but it was not outlined any further how this was measured. In contrast to the paragraph on licensed institutions, the interests of depositors were not mentioned, nor the extent of the liabilities or the risk of the assets. Neglecting these points did not mean that they were unimportant, but probably more that they were taken for granted. *Banking Act 1979*, sch. 2, para. 6.
[632] Ian Morison, Paul Tillet, and Jane Welch, *Banking Act 1979* (London: Butterworths & Co., 1979), p. 42.
[633] Bank of England, 'The Measurement of Capital', *Quarterly Bulletin*, Q3 (1980).

The discussions between the involved parties for the working paper were also the basis for the articles on capital adequacy in the Banking Act 1979. When developing the paper, Peter W. Cooke, Head of Banking Supervision at the Bank of England, stressed that the Bank aimed to develop a strict method for the measurement for capital adequacy. Referring to the attempts to harmonise capital adequacy in Europe, Cooke also stressed that other countries would not accept a system of 'excessive vagueness'. At the same time, Cooke highlighted that the Bank of England would judge the assessment resulting from the application of the measurement methods in a flexible way.[634] The representatives of the British Bankers' Association on the other side emphasised that the proposals by the Bank of England were in general acceptable, but that they were concerned about moving towards a 'more inflexible, formalised system of supervision'.[635]

The final paper on the 'Measurement of Capital' published in 1980 took both the banks' as well as the Bank of England's concerns into account. It once again confirmed that the regulation and supervision of capital adequacy should be flexible, considering the individual characters of the institutions. It also took a clear stance against fixed minimum ratios, which – according to the paper – could be an incentive for overtrading. The paper also argued that the capital ratios should not be public knowledge, as it could weaken the ability to issue new capital when a bank was in crisis.[636]

The Bank of England clearly preferred opaqueness over transparency, adding that 'the Bank's views on capital adequacy have been discussed with individual banks in confidence for some time past. This will continue.'[637] In the internal discussions leading to this final statement, the British Bankers' Association lobbied strongly for this policy. According to the representatives of the banks, publishing a capital ratio 'could lead to banks carrying more capital than was absolutely necessary in order to avoid a run on confidence.'[638] The British Bankers' Association also warned about a 'potential risk of misunderstanding' if detailed information on capital adequacy were to be published, as

634 British Bankers' Association, *Note of the Meeting between the British Bankers' Association and the Bank of England on the Measurement of Capital, Held at the Bank of England*, Committee of London Clearing Bankers. Capital and Liquidity Adequacy of Banks' (73/3) (London, 12 September 1979), pp. 2, 5, London Metropolitan Archives, CLC/B/029/MS32152B/001.
635 British Bankers' Association, *Note Meeting BBA - BoE September, LMA, CLC/B/029/MS32152B/001*, pp. 2–3.
636 Bank of England, *The Measurement of Capital*.
637 Bank of England, *The Measurement of Capital*, p. 325.
638 British Bankers' Association, *Note Meeting BBA - BoE September, LMA, CLC/B/029/MS32152B/001*, p. 6.

it could undermine ‘confidence in international banking’ and harm the availability of credit.[639]

The paper on ‘The Measurement of Capital’ endorsed the same two capital ratios as the first paper in 1975. The ‘free resources ratio’ ratio was slightly adapted and now termed the ‘gearing ratio’. For the second ratio – the ‘risk assets ratio’ – the Bank of England stressed that it was more useful and was the concept of reference going forward.[640] The definitions of the risk assets were much more detailed than in 1975. The paper stated exact weights for different asset classes. Balances with the bank of England, for example, had zero weight, loans to UK residents a 100% weight. Interestingly, there was even a 200% weight for property owned by a bank, which was probably due to the still recent experience of collapsing property prices at the time.[641] The Bank of England and the British Bankers’ Association spent much time discussing these risk coefficients in the working group. The British Bankers’ Association aimed for a more comprehensive system with many different risk categories. For advances, for example, the Bankers’ Association argued that several risk groups should exist, and one risk category alone would not lead to meaningful results. In addition, the British Bankers’ Association argued strongly for the use of the ‘risk assets ratio’ and questioned the validity of the ‘gearing ratio’.[642]

One important area that had changed until 1980 compared to the preceding working paper on bank capital in 1975 was the definition of capital. Provisions for expected losses were excluded from the capital, which was an outcome of the EEC’s Advisory Committee recommendations, formulated after the EEC Banking Directive in 1977. However, the importance of subordinated debt as a form of capital had grown substantially. Whereas it was still clear that subordinated debt could not absorb losses, it was increasingly emphasised that subordinated debt could also be used to finance fixed assets.[643] In

[639] British Bankers’ Association, *Note of the Meeting between the British Bankers’ Association and the Bank of England on the Measurement of Capital, Held at the Bank of England*, Committee of London Clearing Bankers. Capital and Liquidity Adequacy of Banks’ (73/3) (London, 13 November 1979), p. 2, London Metropolitan Archives, CLC/B/029/MS32152B/001.
[640] Bank of England, *The Measurement of Capital*, pp. 324–27.
[641] Bank of England, *The Measurement of Capital*, p. 329, Appendix A.
[642] British Bankers’ Association, *Note Meeting BBA - BoE September, LMA, CLC/B/029/MS32152B/001*, p. 6.
[643] Bank of England, *The Measurement of Capital*, p. 326.

1975, this role was attributed only to equity capital. The working paper of 1980, therefore, manifested the rise of subordinated debt as a substitute for capital.[644]

6.3.4. Perspectives on Regulatory Changes

The working papers of the Bank of England and the regulation of capital and liquidity in the Banking Act were mostly the results of technical discussions between Bank of England officials and bank representatives. However, on a broader level, questions were also raised about the regulation and supervision of British financial markets. In 1980, the report by the 'Committee to Review the Functioning of Financial Institutions' (Wilson Committee) was published. Despite its general analysis of the financial system, the Committee also discussed the capital level of the banks. It concluded that capital ratios had been falling during the first half of the 1970s, mainly because inflation had driven the balance sheet growth. The Wilson Committee also noted that the fall in capital ratios would have been even more severe if there had not been an extensive 'raising of loan capital', which underlines the importance of subordinated debt.[645]

Various interest groups submitted reports to the Wilson Committee, among them also the Committee of the London Clearing Bankers. The clearing banks highlighted their opinion that simple capital/deposits ratios had lost importance, emphasising instead the trend towards 'measures that reflect the varying degrees of risk attached to different assets.'[646] The Committee of the London Clearing Bankers clearly favoured a 'risk assets ratio'. The clearing banks argued that treasury bills could be financed fully with deposits, as risks of price fluctuations or defaults were negligible. At the other end of the scale, properties could fluctuate and were difficult to sell in a crisis. These characteristics would have to be considered by a capital adequacy framework.[647]

The Bank of England's working papers on capital adequacy in 1975 and 1980, together with the Banking Act 1979 and the EEC's Banking Directive 1977, had set the stage for

[644] Jack Revell, 'Capital Adequacy, Hidden Reserves and Provisions', in *UK Banking Supervision*, ed. by Edward P.M. Gardener (London: Allen & Unwin, 1986), pp. 218–33 (p. 220).
[645] Committee to Review the Functioning of Financial Institutions (Wilson Committee), *Committee to Review the Functioning of Financial Institutions*, Cmnd. 7937 (London: Her Majesty's Stationary Office, 1980), para. 278-284.
[646] *The London Clearing Banks: Evidence by the Committee of London Clearing Bankers to the Committee to Review the Functioning of Financial Institutions*, ed. by Committee of London Clearing Bankers (London: Committee of London Clearing Bankers, distributed by Longman, 1978), p. 59.
[647] Committee of London Clearing Bankers, *The London Clearing Banks*, p. 69.

the assessment of capital adequacy. The initial trigger that had brought the topic of capital adequacy back onto the domestic agenda was the secondary banking crisis. The development of the framework for assessing capital adequacy on a domestic level, however, interacted with international developments.

The Banking Act 1979 was replaced by a new Banking Act in 1987. The new Act was mostly the consequence of the rescue of Johnson Matthey Bankers by the Bank of England in 1984. The bank failure was followed by another parliamentary report in 1985, which reviewed banking supervision in the United Kingdom.[648] The Act of 1987 brought many changes: it ended the two-tier system of recognised and licensed banks, among other things, and increased the power of the Bank of England as a supervisor. With regards to the regulation of capital, however, not much altered.

The Banking Act 1987 still required each bank to 'conduct its business in a prudent manner'. This meant that 'net assets' and 'other financial resources' would have to be considered as appropriate by the Bank of England.[649] The amount of capital that a bank needed to maintain would depend on the nature and scale of the institution's operations and the 'risks inherent in those operations'.[650] The Bank Supervision Division of the Bank of England further outlined the definition of capital adequacy based on its initial working paper from 1980. In a paper on subordinated loan capital, the Bank Supervision Division then further specified the requirements of subordinated debt to be part of 'other financial resources'.[651] The risk-weighting approach for credit risks on the asset side, developed in 1980, was expanded upon in a paper in 1986.[652] Other types of risks, such as operational and foreign exchange risks, were also discussed and formed part of the Bank of England's assessment. Based on the individual analysis of each bank, the Bank Supervision Division defined a minimum capital ratio, termed the 'trigger ratio', and a goal for the capital requirement, referred to as the 'target ratio'.[653] However, little was known publicly about the exact process that led to the setting of the individual ratios.

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[648] Committee Set up to Consider the System of Banking Supervision, *Report of the Committee Set up to Consider the System of Banking Supervision*, Cmnd. 9550 (London: Her Majesty's Stationary Office, 1985).
[649] *Banking Act 1987*, *C. 22*, 1987, sch. 3, para. 4 (2).
[650] *Banking Act 1987*, sch. 3, para. 4 (3).
[651] Bank Supervision Division, Bank of England, 'Subordinated Loan Capital', 1986.
[652] Bank Supervision Division, Bank of England, 'Measurement of Capital', 1986.
[653] Graham Penn, *Banking Supervision: Regulation of the UK Banking Sector under the Banking Act 1987* (London, Edinburgh: Butterworth, 1989), p. 167.

When the Basel Committee on Banking Supervision issued its first common framework for the assessment of capital adequacy in 1988, the Bank Supervision Division issued a paper on how the international framework could be implemented in the United Kingdom.[654] The Bank Supervision Division noted that the international convergence would not change much for UK banks.[655]

The United Kingdom transferred to a Basel-compliant framework by the end of 1989. One of the key differences was that it also took off-balance-sheet items into account. However, the general approach towards the regulation of capital did not change. Capital requirements in the form of 'trigger' and 'target risk assets ratios' were still set based on individual evaluations of banks and continued to be confidential. The Bank of England noted that British banks would already meet the 8% capital requirement, and that it would therefore not revise the individual 'trigger' and 'target ratios'.[656]

The introduction of Basel I in the United Kingdom marked the end of the process. Capital in banking had been almost irrelevant from the 1920s to the 1960s, until the secondary banking crisis at the beginning of the 1970s revived discussions about capital adequacy and triggered a series of papers by the Bank of England on the topic. Risk-based approaches to solvency found increasingly more attention in supervisory practice after 1975. Basel I and its application in 1988 represented only a gradual evolution that built on the already existing domestic framework for capital regulation. As such, this is not surprising. The United Kingdom took part in the discussions on a European and international level and certainly influenced these discussions. The inclusion of subordinated debt as part of the Tier 2 capital under Basel I, for example, was clearly in the interests of the United Kingdom. At the same time, the international approach towards solvency certainly influenced domestic evolution as well (e.g. the treatment of provisions).

Despite all the regulatory changes, however, approaches on the supervisory side did not change to any great extent. The Bank of England remained independent in setting individual minimum capital ratios for banks, and there was never a legally prescribed capital ratio.

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[654] Bank Supervision Division, Bank of England, 'Implementation of the Basle Convergence Agreement in the United Kingdom', 1988.
[655] Bank of England, *Bank of England Banking Act Report 1988/89* (London: Bank of England, 1989), p. 15.
[656] Bank of England, *Bank of England Banking Act Report 1989/90* (London: Bank of England, 1990), p. 18.

6.4. Conclusion

This chapter has shown how banks, and more specifically bank capital, were regulated until the 1980s. It has outlined how regulation and supervision developed over time and discussed the role of banks in developing the regulatory framework.

The introduction of statutory banking regulation in the United Kingdom came comparatively late. The Banking Act 1979 was the first comprehensive banking legislation. Before that, banking legislation consisted of several individual pieces of legislation, affecting different areas of banking. Supervision was conducted informally and flexibly by the Bank of England. The role of capital in British banking was also unimportant until the 1970s. Until then, solvency was rarely discussed publicly, and the Bank of England attached its primary attention to liquidity. Change was ultimately initiated by the secondary banking crisis as well as growing competition from foreign banks.

Switzerland introduced banking legislation on a national level much earlier, in 1934/1935. The group of the Big Banks had been profoundly affected by the Great Depression, and losses on foreign loans and securities led to solvency problems. This has contributed to the fact that the regulation that followed the Great Depression addressed not only liquidity, but also solvency. Most of the Swiss banks did not even reject a statutory capital requirement. There were several reasons for this. Firstly, capital had always played an essential role in the Swiss system. It was considered as a source of stability and trust. Banks often considered the risk of their business activities when considering further capital issuances. Unwritten conventions developed on what amount of capital was deemed adequate for which banking group. The new minimum requirements to some extent replaced these conventions. Secondly, most banks had already fulfilled the capital requirements and were thus unaffected by the implementation of the new law. Moreover, those few Big Banks that were busy with reorganising their own capital structure as a result of the depression lacked bargaining power on the topic of solvency.

The United Kingdom did not go through a crisis that would have required government rescues of insolvent banks in the 1930s. The absence of solvency problems probably even reinforced British belief in liquidity as the critical determinant of banking stability. Moreover, the 1930s and the Second World War gave rise to a strict monetary policy. It subjected financial policy to monetary goals, enforced by the strict but informal control of the Bank of England. It took another crisis, decades later, for banking legislation to be

reconsidered. The secondary banking crisis in 1973 revealed many of the problems of the existing regulatory framework. Among them was the fact that a substantial part of the financial sector, the secondary banks, were outside regulatory scope. It also triggered a reassessment of liquidity and solvency in banking between 1975 and 1980 in the form of working groups by the Bank of England and representatives of the clearing banks.

The discussions between the Bank of England and the clearing banks coincided with attempts by the European Economic Community to harmonise financial legislation in the 1970s. While not the trigger of the reassessment of capital adequacy in the United Kingdom, the discussions on the European level certainly provided impulses for British policy change. Likewise, the British representatives tried to moderate the ambitions of legislative plans on the European level. Discussions on both domestic and international level interacted and encouraged the trend towards a risk-weighted view on capital requirements. This development can also be traced in the supervisory practice of the Bank of England. Up until the 1970s, the Bank of England still used the ‘free resources ratio’. From the late 1970s, the ‘risk assets ratio’ became more fashionable, categorising the assets into different risk categories and attaching a certain risk weight to each category. Despite the introduction of the Banking Act in 1979 and another Banking Act in 1987, the British system of regulating capital remained flexible and individualised. The Banking Acts stated that the amount of capital would have to be ‘appropriate’ but left the actual definition of capital adequacy to the Bank of England.

Interestingly, the Swiss regulatory framework was planned to be discretion-based as well and used the same word (appropriate) to describe the adequate amount of capital in the Swiss Banking Act. Opting consciously against the concept of rule-based regulation, the Federal Council emphasised the importance of assessing banks individually when the Banking Act and Banking Ordinance were introduced in 1934/1935. The ambition to have a flexible system of regulation was there. However, the actual design of the regulation was clearly more rule-based. Minimum capital ratios were stipulated in the Banking Ordinance that applied to all banks. There was only slight individualisation, allowing banks with high shares of mortgages in their balance sheets to hold lower amounts of capital.

Switzerland’s legal framework for the regulation of capital as well as its supervisor were relatively toothless, maybe exactly because regulation and supervision did not aim to be rule-based. From the late 1950s, the Swiss financial centre started to expand rapidly. The balance sheet increases of the Swiss Big Banks reached up to 20% per year. In

1958, the minimum capital/liability ratio became a bottleneck for growth. The banks grew at such a rapid pace that – despite frequent capital issuances – they did not meet the capital requirements anymore. By 1963, the three largest Swiss banks, representing one-fourth of the banking market in terms of total assets, failed to comply with capital regulation. Regulatory changes were obtained that lowered the minimum capital ratio and broadened the definition of capital. These changes were negotiated mostly between the banks and the supervisor and were usually viewed as a compromise between these two parties.

Both Switzerland and the United Kingdom have in common that the supervisor and the banks interacted closely when developing the regulatory design for regulating capital. There was little political and public involvement in the process. One might argue that this is not surprising, given the technical level of such discussions. At the same time the decisions taken concerned one of the cornerstones of banking legislation and – at least in Switzerland – were an important condition for the growth of the banking market.

In the United Kingdom, the system of supervision was, by definition, participative and personal. As in Switzerland, the banks were highly involved once capital regulation was developed in the 1970s and 1980s. The two key policy papers on capital adequacy in 1975 and 1980 were the result of a joint working group between the clearing banks and the Bank of England.

The idea of risk-weighted assets has many roots. The Bank of England's working paper on the 'Measurement of Capital' (1980) set out a system of assessing solvency similar to the Basel I framework of 1988, several years beforehand. Similarly, Switzerland had introduced a risk-weighted approach in 1981. Both the Swiss and the British models reflect the trend towards a more differentiated analysis of risk. The first steps towards such models, however, can be observed much earlier.

The expert group working on Switzerland's regulation in the 1930s, for example, stated that capital should depend on the risk, though lacked a concept to measure asset risk. The high levels of government debt in the balance sheets of banks certainly also contributed to a more differentiated analysis. Banks could argue that their actual capital position was not deteriorating if government securities were to be considered risk-free. And the governments, depending on the banks for financing, were likely not to question such a rationale.

The origins of Basel I, which fundamentally shaped the way capital is regulated today, are therefore far-reaching. The implementation of Basel I in the United Kingdom and in Switzerland was only an evolution of existing frameworks. Discussions on both a national and domestic level had already led to converging regulatory frameworks before the actual legislation was introduced.

Another point that deserves to be mentioned is the role of compromises in the regulation of banks. In Switzerland, all discussions on how to develop the regulation of capital after the 1930s used the existing framework as a starting point. Changes in this framework were often the result of a compromise between supervisor and banks. The question of financial stability and whether it might require a completely different set of regulations was never raised. The United Kingdom was slightly different in the sense that capital adequacy was only discussed again from the 1970s onwards. The working papers and subsequent supervisory practice, however, also very often give the impression of compromises being made between the regulator and the regulated. The involvement of banks in the process of regulation, coupled with the absence of fundamental questions about sources of financial stability, is somewhat striking.

The choice of a minimum capital requirement is a case in point. In 1934, the experts developing the Banking Act and Ordinance in Switzerland had to come up with an appropriate capital requirement. The capital requirements of 10% and 5% respectively were derived from an analysis of the banks' capital levels at the time. The ratio was considered adequate because most banks already met it. Similarly, the choice of 8% in the Basel I process was the result of a compromise between the countries involved. Most banks already fulfilled the requirement. Instead of considering which regulatory structure provided an optimal or desired level of financial stability, the setting of capital requirements was an endogenous process. The level of adequate capital was derived from analysing existing circumstances instead of a consideration of which circumstances might provide for a stable financial system.

Even though the motives of many regulatory changes were to bolster the capital level of banks, they did not seem to achieve it. The introduction of the first capital requirement in Switzerland in the mid-1930s aimed to ensure the solvency of banks. The minimum threshold for capital, however, was soon to be violated. Likewise, in the 1970s and 1980s, even with a sudden awareness of the relevance of capital and the capital ratios on both a domestic and international level, the capital levels did not substantially increase.

At the same time, it has to be noted that the internationalisation of the financial markets created good arguments for developing the regulation and supervision of banking. There is an understandable demand among banks, regulators and governments for a level playing field. A case in point is the references made by banks to international competition when asking for regulatory changes. Moreover, governments also have interests in promoting their financial centres, which can lead to coalitions between governments and banks. While this chapter has provided an in-depth analysis of the regulation of capital, the political economy perspective could certainly be developed further going forward.

7. Conclusion

The previous chapters have addressed the topic of capital in banking from different perspectives. The thesis critically assesses the evolution of capital ratios and the validity of the numbers used. The chapters do not follow one single explanatory factor for capital ratios through time and space. Instead, the goal was to contribute to a deeper understanding of vital drivers. The general trend of the evolution of capital ratios was shown by looking at banks in Germany, the United States, the United Kingdom, and Switzerland. An in-depth analysis of the role of ideas, wars, and regulation focused on the two latter countries, the United Kingdom and Switzerland. The following sections follow the key themes and main findings of the thesis, discuss limitations and provide an outlook for further research. Moreover, more general insights into the long-run development of banking regulation will be discussed.

The analysis of the financial systems in the United Kingdom and Switzerland over a time frame of about one and a half centuries required a topical focus. This was done by focusing on three main issues: the role of perceptions and conventions in the 19th century, the effects of the First and Second World Wars on capital ratios, and the evolution of capital regulation.

Capital adequacy in banking can be measured with various ratios. Historically, two different types of measures were used: risk-unweighted and risk-weighted ratios. The former was mostly a capital/deposits or a capital/liability ratio. The latter – emerging in the 1970s – categorised assets according to their credit risk and compared capital to these assets. The ratios used in the United Kingdom from the 1970s varied from those used in Switzerland. The underlying idea about the relationship between risk and capital, however, was the same. The concept that an adequate amount of bank capital should depend on a bank's risks had existed since the very beginning of joint-stock banking in the 19th century. Contemporaries identified the asset side of balance sheets as a key source for risks in banking. With this perception, the evolution from risk-unweighted to risk-weighted capital ratios was logical. By looking at perceptions of capital adequacy in the 19th century and discussions in the process of creating banking legislation during the 20th century, I have traced the evolution towards risk-weighted solvency models.

The capital/assets ratio was chosen to outline the increased leverage in the banking systems over time. The thesis shows that capital/assets ratios had been falling throughout the 19th century and the beginning of the 20th century. This trend accelerated

during the two World Wars and was interrupted by a period of recovery of the capital levels in the interwar period. By 1945, the capital/assets ratios were already low. British banks had a capital ratio of 2.9%, their Swiss counterparts 10.4%. The evolution of capital ratios in the second half of the 20th century was relatively flat, with only small reductions of the capital level despite high growth rates of total assets. However, it has to be noted that a relative decline from 4% to 3% is high and substantial, as compared to a comparatively modest decline from 14% to 13%. Thus, changes in the capital ratios during the second half of the 20th century cannot be neglected. The thesis presents the general evolution of capital ratios in four countries, while the academic literature confirms this general trend of declining capital ratios for a broader set of countries.[657]

A closer analysis of capital ratios in the United Kingdom and Switzerland shows that the comparatively different levels of ratios in the two countries are of little explanatory value. Firstly, the capital/assets ratios often used by the academic literature only consider the paid-up capital. However, the total liability of shareholders can go beyond the paid-up capital. For certain periods or types of banks, there was even an unlimited liability of shareholders, which influences the capital/assets ratios. Secondly, different accounting standards had allowed the extensive build-up of hidden reserves. The actual capital strength of banks was therefore often underestimated by published figures. Thirdly, the underlying definitions used to construct time series data has varied, sometimes even with regards to the financial institutions that were considered as banks and thus included in such statistics – or not. And fourthly, long-run time series are usually composed of different individual time series based on inconsistent definitions. Thus, a historical narrative discussing the long-run evolution of capital in banking is crucial. Simply plotting data in a graph covering more than a hundred years is not enough. A careful discussion and examination of the time series is required.

For the United Kingdom, the topics of shareholder liability and hidden reserves are well documented, most notably by contributions from John Turner and Graeme Acheson as well as Forrest Capie and Mark Billings (see Chapter 3). In the Swiss context, the thesis provides the first insights into these topics with data estimates. Nevertheless, a more representative view on the Swiss market would certainly necessitate further research based on so far inaccessible archival material from Swiss banks. The academic literature comparing capital/assets ratios on an international level usually neglects the issues briefly touched upon above. To some extent, leaving hidden reserves and shareholder

[657] See for example: Grossman, *Unsettled Account*. Jordà and others, *Bank Capital Redux*.

liability aside is understandable, given the complexity of the topic and the data availability. At the same time, the lack of critical assessment of the data – especially outside the financial history literature – is somewhat surprising.

Chapter 4 of the thesis shows that conventions often served as guidelines for capital adequacy in the 19th century. Solvency was almost unregulated at the time and thus there were no minimum or target capital ratios that banks could follow. However, bank directors already had well-founded ideas about the role of capital and the relationship between risk and capital in banking in the early period of joint-stock banking. At the beginning of the joint-stock banking era, many banks still aimed for fixed capital thresholds. Most notable is the 1:3 capital/deposits ratio stipulated by James William Gilbart in 1827. English banks quickly abandoned such standard figures, whereas in Switzerland, conventions remained surprisingly persistent over time. The reason for these fixed ideas can also be found in different business models. The Swiss Big Banks focused more on the long-term financing of industry and trade in the 19th century. Contemporaries even referred to them as 'trading banks' or 'speculation banks'. In contrast, the English joint-stock banks had much shorter maturities on the asset side. When the Swiss banks publicly elaborated on the adequate level of capital, they considered the riskiness and long durations of their assets. Once the business models of banks changed, fixed capital thresholds started to disappear. On a broader level, these fundamental differences between the continental and the British bank models are well-established by academic literature and were recognised already by contemporaries.

The thesis sheds new light on the interests of shareholders and depositors in guiding the capital policies of banks and thus shaping conventions on capital adequacy. Numerous academic articles in economics and corporate finance deal with capital policies, signalling of banks, the timing of capital issuances, or principal-agent problems between bank managements, investors, and creditors (see Section 2.3). The analysis of statements from bank directors indicate that conventions were often guided by compromises between shareholders' and depositors' interests. The emphasis on the interests of depositors, however, vanishes over time. Both the early joint-stock banks in England and Switzerland often justified capital increases by assuring investors that their dividends would not be substantially diluted. In the 19th century, bank directors already understood the incentives provided by high leverages. As Walter Bagehot noted in 1873: 'The main source of the profitableness of established banking is the smallness of the

requisite capital'.[658] This strong incentive might also explain the popularity of (disclosed and hidden) reserves, unpaid capital, or other forms of liabilities and guarantees. Dividends were paid on paid-up capital. And having a high and stable dividend was often perceived as a signal of stability and therefore positive for the reputation of a bank.

As Chapter 5 outlines, the two World Wars fundamentally changed the perception of capital ratios in banking. Rapidly increasing government debt, of which banks held substantial parts, led to growing total assets. The war years were coupled with inflation, which diminished the real value of the capital. At the same time, there were almost no capital issuances during the two wars. These factors led to a sharp decline in capital/assets ratios. The high levels of government debt in bank balance sheets also furthered discussions about capital adequacy and the risk of assets. Government financing was often seen as a key driver of the balance sheet growth and falling capital ratios. This contributed to the view that the high level of government debt must be considered when assessing capital adequacy. Together with the knowledge and awareness of risk and its relationship with capital (Chapter 4), it reinforced the trend towards incorporating the risks of assets when assessing capital adequacy. In my opinion, the interaction of knowledge about risks in banking and high volumes of government debt in banks' balance sheets created the trajectory for the banking legislation that culminated in the risk-weighted capital adequacy framework of Basel I in 1988.

Chapter 6 of the thesis introduces the regulatory and supervisory systems in the United Kingdom and Switzerland. Two streams of literature relate to this chapter. On the one hand, several authors (most notably Charles Goodhart) have discussed the history of the Basel Committee on Banking Commission. To this literature, the chapter acts as a prelude, with a focus on two countries that were involved the development of Basel I. On the other hand, scholars have analysed the evolution of banking regulation and supervision in the United Kingdom and Switzerland. Building on this literature, Chapter 6 provides an in-depth analysis of the regulation of capital and the use of capital ratios in supervisory practice.

Different principles guided the regulatory systems in the two countries. In Switzerland, nationwide banking legislation with minimum capital ratios was introduced in 1934/1935. The Swiss legislation was meant to be a discretionary framework, providing the Federal

[658] Bagehot, *Lombard Street*, p. 114.

Banking Commission to supervise the liquidity and solvency of banks flexibly. When looking at the continuous development of the regulation, however, it becomes evident that it tended to be more a rule-based than a discretionary legal framework. The United Kingdom opted for a different system of informal supervision and regulation that consisted of several individual acts until 1979, forming a complex web of regulations. While there were no minimum capital ratios, the Bank of England acted as an informal supervisor and monitored liquidity and solvency ratios. Its focus, however, was clearly on liquidity. Even the Banking Acts of 1979 and 1987 did not introduce a minimum capital ratio. Instead, the existing regulatory framework allowed the Bank of England to assess capital adequacy flexibly and on an individual basis. By the 1980s, both Switzerland and the United Kingdom had arrived at a system that regulated capital based on a risk-weighted approach – long before the introduction of Basel I, which harmonised the frameworks for measuring capital adequacy.

A commonality of the banking regulation in both countries lies in the involvement of banks in shaping the regulatory environment. In Switzerland, the changes in capital regulation were initiated by the Swiss Big Banks and the Swiss Bankers Association once banks struggled to meet the capital requirements in the late 1950s. In the United Kingdom, the Committee of London Clearing Bankers and later the British Bankers' Association were part of joint working groups led by the Bank of England from the 1970s. These working groups developed the relevant policy papers for assessing capital adequacy. It is probably too simplistic to view the involvement of the banks in the regulatory process and subsequent regulatory changes as a result of the banks' lobbying only. The development of regulation occurred in the context of financial globalisation and growing international competition. In this context, the interest of governments might have been congruent to that of banks, given their economic relevance as taxpayers and employers. Nevertheless, there is a clear imbalance in the involvement of different interest groups in the process of regulatory development.

As mentioned, the two countries had a common endpoint: a risk-weighted framework for capital adequacy. But what can explain the different trajectories of their regulatory and supervisory systems before this point? Firstly, the market structures in both countries varied significantly. While the British banking market was already highly concentrated by 1918, the Swiss market is, up until today, very fragmented, consisting of a high number of banks. Secondly and related, the British banking system was highly focused on the financial hub of London. In contrast, Swiss finance consisted of various regional centres in Zurich, Geneva, and Basel. Moreover, the Swiss political system favoured

decentralisation. A case in point was the establishment of Cantonal banks by Cantons. Their establishment tied up banking and political interests on a regional level and was a counterbalance to centralisation tendencies. In the United Kingdom, both market structure and centralisation favoured a system of informal supervision. A small number of banks located in a small perimeter around the Bank of England was easier to control through moral suasion. This system reached its limits once many foreign banks and new domestic banks entered the market during the 1960s.

Another question that has to be addressed when comparing the two countries is the strong perception of liquidity as a central determinant for banking stability in the United Kingdom. In Switzerland, banks and supervisors viewed both capital and liquidity as vital for a sound banking market. In the United Kingdom, capital surfaces as a relevant topic only in specific periods: at the beginning of the joint-stock banking era in the 1830s and 1840s, towards the end of the Amalgamations movement in 1918/1919, and after the secondary banking crisis in the early 1970s. Between 1919 and 1973, solvency was almost irrelevant. The reasons for this difference lie in the varying business models and monetary policies. British and Swiss banks were fundamentally different in terms of liquidity and the credit risk of their assets (briefly discussed above). Furthermore, the Bank of England subjected banking policy to monetary policy, aiming to secure government financing at low interest rates. The tools to conduct monetary policy through banking policy were lending and liquidity requirements. In Switzerland, the Swiss National Bank might have had an interest in such interventions as well, especially when the large-scale capital inflows of the 1950s and 1960s undermined its monetary policy. However, given the institutional division of monetary policy (Swiss National Bank) and banking supervision (Federal Banking Commission), this was hard to achieve.

In both countries, financial crises triggered the introduction of banking legislation. In Switzerland, the first attempts to regulate banking on a national level were made before the Great Depression. Significant losses in the banks' balance sheets and the government rescues of two Big Banks, of which one eventually failed, led to a breakthrough. The banks no longer resisted the introduction of capital requirements, especially as most banks already met the statutory minimum ratios. In the United Kingdom, the secondary banking question at the beginning of the 1970s led to an overhaul of banking regulation and supervision. However, the general trend towards a risk-weighted framework was already prominent at the time, on both a European (EEC working groups) and international level (BCBS).

Two roles of capital have frequently been discussed, from the emergence of the first publications on banking in the 19th century to the present. The first is that paid-up capital, together with reserves and retained profits, can be used to cover losses on the asset side (loss absorbency function). Secondly, capital was thought to be essential to induce trust for depositors (guarantee function). In the absence of trust, depositors would be likely to withdraw their deposits. In the most extreme case, a bank-run would lead to immediate illiquidity. The first role relates directly to capital and cannot be replaced. The paid-up capital and reserves should cover unexpected losses. Both forms of capital can provide the loss absorbency capacity alone.

The second role – the guarantee function – does not necessarily have to be provided by capital. In the past, paid-up capital was just one factor facilitating this role of inducing trust. Various forms of guarantees can provide a similar function. A guarantee relates to the fulfilment of the condition that liabilities are secured by a substantial degree in case of losses. Unlimited liability, other extended forms of shareholder liabilities (e.g. limited to a certain amount), or guarantees by political entities (e.g. for Cantonal banks in Switzerland) are examples for the guarantee function. In the presence of guarantees inducing trust and reserves absorbing losses, one may even argue that paid-up capital is not necessary at all. Thus, the question of how much capital is adequate in banking cannot be answered with ratios such as 5% or 50%. It depends on the factors facilitating the trust and loss absorbency functions.

Yet another dimension of inducing trust is rooted in the relationship between depositors and shareholders. The thesis has shown that banks presented their choice of an adequate capital level often as a compromise between depositors and shareholders, indicating that the two parties do not necessarily have aligned interests. On a theoretical level, the agency theory suggests that debt contracts incentivise shareholders to substitute riskier assets for safer ones. Such a process may happen at the expense of creditors in absence of sufficient information. Moreover, shareholders lack the incentive to invest new capital in a bank that is close to bankruptcy, because creditors would benefit most if additional capital is contributed.[659] The implication of this argument is that depositors have an interest in high capital ratios or other forms of guarantees because it lowers the incentives for shareholders to act against their interest. In other words: High capital ratios or other guarantees, for example extended shareholder liabilities, can induce trust to depositors, because it may prevent banks from increasing the risk of their

[659] Myers, *Determinants of Corporate Borrowing.* See also Section 2.4 for a discussion.

assets at the expense of depositors. Analysing the British case, John Turner highlights the relevance of risk-shifting as a determinant of financial instability. Turner argued that Britain's financial repression policies between 1939 and the 1970s were a replacement for share capital.[660] The fact that low capital ratios concerned neither the Bank of England nor the depositors supports this argument. Once the repression policies ended, banks gradually increased their risk-shifting.[661] Thus, shareholder liabilities beyond the actual share capital are crucial when elaborating on the trust of depositors in a bank.

There are also other examples for the guarantee function inducing trust for depositors. As shown by the British case, trust can also be rooted in a very strict supervisory system with a strong emphasis on liquidity. Other factors that can induce trust in the system are deposit insurances, lender of last resort functions, or implicit government guarantees (e.g. due to too big to fail problems). Given this large number of potential guarantees, the question is who should provide what to induce trust in the stability of the banking system.

Essentially, there are three entities that may induce trust: the state through regulation (i.e. capital requirements, safety nets, guarantees by governments), the shareholders (i.e. by the extent of their liability), and the bank itself (i.e. by choosing the degree of risk of its business model and its capital policy). There is not one single optimal set of distribution of the guarantee function among these three players. Historically, however, there was a clear shift towards the state taking over more guarantee roles.

The US-American economist Gordon Tullock once suggested that car manufacturers should install a big spike on each steering wheel instead of seat belts. In the face of immediate danger, cars would be driven more safely than with seat belts. Probably inspired by Tullock, Ben Bernanke used a similar analogy – a dagger in the steering wheel of a car – to discuss the incentives of high or low leverages for corporations. The longer the dagger, according to Bernanke, the higher the leverage. Even small turbulences triggering the driver to break can be deadly when operating with high leverages.[662] However, the extent of a leverage – or the length of the dagger – also depends on the environment. In a world where cars are allowed to drive at only 30 km/h,

[660] Turner, *Banking in Crisis*, pp. 9–10.
[661] Turner, *Banking in Crisis*, pp. 173-203.
[662] Bernanke, *Is There Too Much Corporate Debt?*, p. 11.

the dagger can be longer. A world without speed limit, however, necessitates safety buffers.

I believe that one should be careful with deriving banking policy implications from a historical narrative on two countries that is subject to many limitations. Nevertheless, I venture to highlight two observations when analysing the regulatory and supervisory frameworks in the United Kingdom and Switzerland. Firstly, the premise of financial market stability was often not the starting point when capital requirements were discussed. Existing regulatory frameworks or conventions usually served as a blueprint. Regulatory changes built on these existing frameworks and interest groups tried to influence the development of the legal frameworks, resulting in the growing complexity of banking regulation. It might be worth fundamentally reconsidering determinants of financial stability rather than ameliorating the weaknesses of an existing framework time after time. In this context, the distribution of the guarantee function as outlined above between the state, shareholders, and banks should be reconsidered too. In an ideal world, all costs would be internalised and there would be no incentives for risk-shifting.

Secondly, and related to the first point, the risks in banking and its regulation were reassessed once the financial markets globalised in the 1970s. As shown in Chapter 6, the question of capital requirements has been debated both nationally and internationally. Key venues for such discussions have been the Committees in the European Economic Community, the Basel Committee on Banking Supervision, and domestic working groups that deliberated the topic of capital adequacy. However, despite all these forums, what would have been in the opinion of the author the most crucial step, the introduction of substantially higher capital requirements, was not taken. In a way, this would only have been logical: the threat of financial instability as a result of financial globalisation was recognised. It triggered international financial cooperation, of which Basel I is one outcome. Many European countries already had risk-weighted capital adequacy frameworks in place. The transition to Basel I was for many more an evolution than a revolution. With regards to capital requirements, however, the threat of financial instability was not acted upon. Instead, the Basel I capital requirement oriented itself on already existing capital ratios and therefore, in most countries, did not substantially increase the required level of capital.

There are many topics which have been beyond the scope of this thesis but offer avenues for further research. Related to the role and interests of banks, shareholders, and states, the political economy view on regulatory changes was often neglected here.

Instead, the thesis aimed to provide an in-depth view of the legal frameworks as well as conventions and perceptions on capital ratios. Moreover, the research period of the thesis stops in 1988, even though the regulatory framework for assessing capital adequacy undergoes a fundamental change in the years following 1988.

The capital/assets ratios of British banks remained almost stable from the late 1980s until the beginning of the financial crisis in 2007 (1988: 5.7%; 2007: 5.3%). In Switzerland, the capital/assets ratios dropped from 6.4% to 4.5%. However, this analysis on a country-level is misleading. The capital/assets ratios of large international banks were lower. In the United Kingdom, the average capital/assets ratio of the British Big Four banks (respectively their succeeding entities) stood at 4.2% in 2007.[663] The two remaining Swiss Big Banks, Credit Suisse and UBS, had an average capital/assets ratio of only 2.4% in 2007. Before the financial crisis, banks, regulators, supervisors, and the wider public did not seem to be interested in unweighted capital ratios anymore – which changed rapidly in subsequent years. Until 2007 banks were praising their strong (risk-weighted) BIS capital ratios, while having declining unweighted capital ratios. The divergence of the two capital ratios (weighted and unweighted) was particularly strong in Switzerland.[664] Another important development was the strong growth of total assets among large international banks from about 2003 to 2007. Strikingly, the BIS capital ratios grew slowly, despite the rapid expansion of total assets.[665] The development of the Basel framework after 1988 facilitated the rationale for the assessment of capital adequacy. The extension of Basel I to include market risk in 1996 introduced the concept of Value at Risk into supervisory practice and banks were allowed to use their proprietary risk models. The leeway of banks for assessing risks and therefore influencing the amount of risk-weighted assets was further increased with Basel II and the widespread use of internal rating-based (IRB) risk models among large international banks. These changes in the Basel framework – and their impacts on capital levels in banking – were excluded in this thesis but would certainly deserve closer attention.

Selecting the United Kingdom and Switzerland for closer analysis in this thesis offered the benefit of working on one country with a very established and broad academic

[663] Calculation based on consolidated balance sheet data (31 December 2007) of Barclays, Lloyds, Royal Bank of Scotland (who took over NatWest in 2000), and HSBC (who took over Midland in 1992).
[664] For the development of weighted and unweighted capital ratios in Switzerland, see: Swiss National Bank, *Financial Stability Report 2008* (Zurich: Swiss National Bank), pp. 32-33.
[665] For the development of weighted capital ratios and total assets of British banks, see: Bank of England, *Financial Stability Report October 2008* (London: Bank of England), p. 9.

literature and another for which there are still many topics to be researched. Besides the lower number of academic contributions on Switzerland, the most obvious issue encountered when writing the thesis was the lack of data beyond the official statistics from the Swiss National Bank that start in 1906. This problem was to an extent addressed by working with archival material from the Federal Banking Commission. Nevertheless, gaining direct access to banks' archives – even though the topic of capital in banking is a sensitive one – would be very beneficial for future research. The historical narrative in the thesis focused on two countries, which allowed for a detailed analysis of the role of capital in banking. At the same time, it limits the representativeness of conclusions drawn from the analysis. Including further countries would clearly provide a more complete view on the role of capital in a historical perspective. A final point to be raised is the focus of the thesis on bank capital. Capital is only one factor contributing to financial stability. Therefore, going forward, a more holistic approach with a stronger emphasis on other factors, such as liquidity, monetary policy, or market structures, might be useful.

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