From Competition to Cartel: Bank Mergers in the U.K. 1885 to 1925 *

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Abstract

What happens if banks are allowed to merge during a 40 year period without the regulator (almost) ever saying no? We study the U.K. bank merger wave between 1885 and 1925 in which mergers were unregulated and merger negotiations were confidential. Both bidders (0.7%-1%) and targets (6.6%-8%) gained over the announcement month, as did banks uninvolved in the merger (0.1%-0.2%). Wealth creation appears to be related both to efficiency gains and to increased oligopoly power. As concentration increased, banks reduced loans and increased holdings of government debt. Counties with higher bank concentration had slower growth of employment and branches.

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1 Introduction

The desirability of having a concentrated banking system and the effect of bank concentration on shareholders' wealth and banks' risk taking are important economic and financial issues. A good part of the recent debate in banking has been related to the desirability of more or less regulation in order to prevent 'excessive' risk taking by financial institutions and to avoid system stability problems. While the issue is of critical importance at the present time, the absence of a good number of case studies for modern developed economies has necessitated the examination of historical episodes (see e.g., Calomiris and Wilson (2004), Calomiris and Mason (2003), Moen and Tallman (2000), and Reinhart and Rogoff (2008)).

We study the merger wave in the United Kingdom in the late 19th and early 20th centuries in which banks merged in an unregulated environment. During this period, the share of deposits held by the largest 10 banks in the U.K. rose from 33% in 1880 to 74% in 1920 (see Capie and Rodrik-Bali (1982)), with a far greater increase in concentration in England and Wales (36% to 97%). We find positive wealth gains for bidding banks of 0.8% and for target banks of 6.6% in the announcement month. The gains appear to be mostly driven by the restructuring of poorly performing banks. As the system became more concentrated banks extended fewer loans as a share of assets, and increased their holdings of safe marketable securities. We find evidence consistent with tacit collusion between banks as the industry moved towards high levels of concentration in the period just after World War One. When two banks announced a merger, post-1915, the share prices of other banks jumped by roughly 1.6%. Using panel data at the county level we find that counties with higher levels of bank concentration experienced slower employment growth and slower expansion of the branch network. The period we study is a relatively calm one for banking. There were no major bank failures after the City of Glasgow in 1878 until the last half of the twentieth century. Our results suggest that although heavy bank regulation may improve systemic stability it may not be vital. However, we document that an absence of constraints led to greatly increased concentration in the banking industry, to the likely detriment of consumers of financial services.

We provide insight into two issues. First, we analyze a consolidation process in an almost completely unregulated environment. Neither anti-trust authorities nor merger legislation existed in the period. Mergers, even between very large banks, were possible and did occur, especially in the first two decades of the twentieth century. Mandatory capital ratios and deposit insurance were also absent.[1] The Barth et al. (2001) measure of regulation and supervision would have awarded the U.K. banking system the minimum score for regulation in competition, capital ratios, deposit insurance, and the degree of supervision. The guarantee of a bank bailout, operated by the government or the Bank of England, was neither clear nor well defined. From around the 1880s until 1914, there was some implicit guarantee that (potentially solvent) banks may be saved by other commercial banks under the coordination of the Bank of England, as happened during the Barings crisis of 1890 (see Collins, 1992). However, there was no formal system of supervision and regulation. The combination of these factors gives us the opportunity to analyze shareholder gains and banks' risk taking in a virtually unconstrained environment. Our study provides a useful benchmark with which to compare modern studies in which regulatory issues are relevant.

The second issue is that many studies of mergers and acquisitions (M&As) find non-positive wealth effects for bidding firms around the merger announcement, with the most negative effects due to takeovers of publicly traded firms (see e.g., Andrade et al. (2001), Fuller, Netter, and Stegmoller (2002), Officer (2003, 2004), Betton, Eckbo, and Thorburn (2008), and Hackbarth and Morellec (2008)). If M&As often destroy wealth, why do managers undertake acquisitions? A group of explanations rely on the possibility that managers may engage in M&As in order to maximize their own utility at the expense of shareholders (e.g., Roll (1986), Piloff and Santomero (1998), and Malmendier and Tate (2008)). Other studies find that M&As are initiated by firms with overvalued equity who wish to pay for the (real assets of the) target with overpriced shares (see e.g., Andrade et al (2001) and Savor and Lu (2009)); another possibility relates to the difficulty to accurately measure M&A returns, due to the difficulty in timing information release (e.g., Becher (2000), Asquith et al. (1983), Jensen and Ruback (1983), and Bhagat et al. (2005)).

[1]Deposit insurance was introduced in 1982 (see Saunders and Wilson, 1999).

In our study we avoid measurement error as the timing of information release can be precisely dated due to the confidential nature of M&As in this era. The two banks' boards would meet in private, settle the terms of the agreement, and then announce the terms to shareholders. The negotiations were kept secret from all but the board; consultants, lawyers, and accountants all appear to have been excluded while a merger was under consideration by the board. With the possible exception of information leaks by board members (of which we find little evidence), information release was full and spontaneous.

The nature of M&A transactions also help us to abstract from an additional measurement problem: the truncation dilemma (see Bhagat et al. (2005)). A measurement problem exists because not all bids succeed and the market weights the potential gains from a merger with the probability the merger eventually proceeds. In our sample the probability of an announced merger being completed is 99.4%.[2] As a result, our estimates are very likely to represent the market's estimate of the full value of the merger.

In a sample of 173 takeovers, we find abnormal returns for bidders of 0.8% on average in the announcement month. Of these 173 abnormal returns for bidders 108 were non negative. In contrast to the literature on more recent M&As we find no evidence of a run-up of bidders' or targets' prices in the months preceding a merger announcement. We also find that target banks experienced positive abnormal returns of 6.6% in the announcement month and the combined abnormal returns were a little over 3%. Most of the gains appear to be due to efficiency savings.

We find that as the banking system became more concentrated banks extended fewer loans, and were therefore less exposed to business cycle risk. The effects appear to be sizeable: a one standard deviation increase in the local market concentration ratio of a bank led to a 22% (4 percentage point) increase in that bank's holding of marketable securities (mostly safe government bonds) and a 5% (3 percentage point) decrease in loans to the private sector. Since the amount of credit extended to the private sectors decreased, the

[2]For a single announcement the target bank shareholders successfully protested against management's acceptance of a proposed merger. We find no instances of bidding banks' shareholders protesting (successfully or not).

main trade-off appears to have been between bank shareholders and bank customers.

The degree of local market competition was not robustly associated with the M&A returns of either the bidder or the target, although a reduction in local competition was beneficial for banks uninvolved in the merger. We measure the degree of local competition that a bank faced as the average Herfindahl-Hirschmann Index (HHI) of the markets(counties) it was present in, weighted by the proportion of its branches in each local market. Over the period 1885 to 1915 competition effects were of little importance. However, as the industry consolidated the benefit to incumbent banks of the disappearance of a rival increased markedly. We find that from 1915 to 1925, in a month in which two banks announced a merger, any banks not involved in the merger achieved an abnormal return of around 1.6%.[3]

We only consider mergers between domestic banks located in England or Wales. Mergers with Scottish, Irish, colonial, or foreign banks are excluded for two reasons. First, they were subject to different banking laws, and second, they operated in different markets. No non-English/Welsh bank operated branch networks within England and Wales (although many had a single branch in London), and English/Welsh banks did not operate branches abroad (with the exception of 2 or 3 branches just north of the Scottish border).

The merger environment British banks operated in differs from the present in two main respects: first, it was unregulated, and secondly there was very effective secrecy during merger negotiations. Differences between our results and the results from studies of contemporary banking systems are due to (at least) these two environmental factors that cannot easily be disentangled.

In Section 2 we review the literature on banks' mergers and acquisitions. In Section 3 we describe the main institutional features of the London financial markets and the British banking system at the turn of the twentieth century. In Section 4 we describe our data sources, we provide variable definitions, and we present descriptive statistics. We present our results on wealth effects in Section 5 and on banks' behaviour in Section 6. Section 7 concludes.

[3]If we exclude the acquisition of 11 small private banks in this decade the abnormal return of uninvolved banks rises to 2.0%.

2 Bank Mergers

2.1 Wealth Effects of Mergers

A large number of studies investigate the wealth effects of banks' acquisitions. Becher (2000) averages the results from six different studies and finds that targets obtain an abnormal return of 20.5% whereas bidders receive a -0.6% abnormal return. Since the bidder is usually much bigger than the target the combined value generated by M&As is very small. Houston and Ryngaert (1994) find an average abnormal return of -2.3% for U.S. bidder banks, and 14.4% for targets, between 1985 to 1991 in a sample of large bank mergers. In a sample of 558 U.S. bank mergers between 1980 and 1997, Becher (2000) finds target banks gain 22% from the announcement, whereas bidders break-even in an event window of (-30, +5) days. However, if a shorter event window is chosen, such as (-5,+5) days, bidder returns become significantly negative. Cybo-Ottone and Murgia (2000) study 54 large banking acquisitions in Europe between 1988 and 1997. In a window of (-1,+1) days, they find positive abnormal returns both for bidders (about 1%) and targets (about 12%). This result appears to be driven by fully domestic deals and deals in which banks diversify into the insurance industry.

Ashton and Pham (2007) study the effect of 61 U.K. financial institution mergers over the period 1988 to 2004. They find that these mergers increase efficiency and have little impact on retail interest rates. Since most U.K. financial firms that were taken over in recent years were unlisted (e.g. building societies) they do not calculate wealth effects.

2.2 Competition and Risk Taking

Two competing hypotheses relate the level of banking competition with the degree of banks' risk taking. On one hand, several theoretical papers argue that increased market concentration leads banks to embark on safer business strategies (e.g., Smith (1984), Keeley (1990), Carletti and Hartmann (2003), and Repullo (2004)). The main reason is that greater market power increases the value of a bank franchise (or the 'charter value'). This increases banks' opportunity costs of bankruptcy. As a result banks act more prudently and pursue low-risk

strategies. On the other hand, another family of studies rejects the previous view and emphasizes that banks in uncompetitive markets are more likely to originate risky loans and generate financial instability. For instance Mishkin (1999) argues that banks in concentrated systems are more likely to be subject to 'too big to fail' policies that encourage risk-taking behaviour by bank managers. Boyd and De Nicoló (2005) argue that by increasing lending rates, banks in less competitive markets exacerbate moral hazard problems with their borrowers, which induces borrowers to undertake riskier projects. As a result, banks facing less competition hold riskier loans in their portfolios.

A large number of studies have tested these competing hypotheses (see Berger et al. (2004) for a survey). Using concentration as a proxy for banks' marker power, De Nicoló et al. (2004) show that more concentrated systems are more likely to experience crises. In contrast, Beck et al. (2006) present evidence that concentrated banking systems are more stable. Recent studies analyze the issue of competition and financial stability employing measures of competition other than the traditional HHI of concentration. Schaeck et al. (2009) use the Panzar and Rosse H-statistic as a measure of bank competition and in a cross-country analysis find that more competitive banking systems are less likely to experience a systemic crisis. Schaeck and Cihak (2010) provide evidence consistent with the notion that competition increases financial stability because it makes the banking sector more efficient. Berger et al. (2008) relate various measures of banking competition in 23 countries to several proxies of risk taking and they find that banks with a higher degree of market power also have less overall risk exposure. Carlson and Mitchener (2006, 2009) show that U.S. states that allowed bank branching during the Great Depression had more stable banking systems: branching opportunities increased local competition and made banks sounder and more efficient.

While these studies have been carried out in settings where regulation plays a very important role, we study how banks reacted to the degree of concentration in an environment where virtually all types of regulation were absent. Our study helps to understand banks' equilibrium risk choices and concentration levels when the government does not oversee the banking sector.

3 British banking in the late nineteenth and early twentieth centuries

3.1 The Consolidation Process

Despite various attempts to codify the running of U.K. banks during the first half of the nineteenth century, by 1885 the British banking system was still largely unregulated (see Grossman (2010) p. 175-183). Banks' lending and underwriting practices were not restricted and capital requirements and deposit insurance did not exist.

Moral hazard problems may have been mitigated as a bank bail-out was uncertain (see Turner (2009)). Investors were aware that bank failures could occur (see Goodhart and Schoenmaker (1995)) and several small public (but unlisted) banks failed during the 40 year period we consider.[4] Whether or not the Bank of England would aid a bank in crisis was unclear *ex-ante*, it had permitted the City of Glasgow Bank to fail in 1878, as well as the small banks just mentioned. On the other hand it had certainly aided Barings in its time of crisis in 1890, although whether this was a bank bail-out, as currently understood, is debatable. Ferguson(2008) says that the BofE (p. 113): 'contribute[d] 1 million towards what became a 17 million bailout fund' and Eichengreen (2008) (p. 34) sees it as a : 'contribut[ion] to a guarantee fund', whereas Cassis (1994) views the process as (p. 6): 'the joint intervention of the banking community, led by the Bank of England.'

In 1870 a total of 387 banks were operating in the United Kingdom (see Capie and Rodrik-Bali (1982)). British banks were mainly commercial banks involved in various types of business activities: they provided short-term credit to local firms and attracted deposits.[5] Towards the end of the nineteenth century the British banking industry experienced considerable growth in M&A activity (see Figure 1). Between 1870 and 1921 there were 264

[4]London and General Bank (1892), Dumbell's Bank (1900), Carlton Bank (1901), Cheque Bank (1901), Economic Bank (1905), London Trading Bank (1910), Birkbeck Bank (1911), and Civil Service Bank (1914).

[5]In contrast to German banks British banks did not purchase large equity stakes in industrial concerns, nor would they lend formally for long periods for the acquisition of property, plant, and equipment (see Fohlin (1998) and Collins and Baker (2003) p. 63).

bank mergers (or 'amalgamations', as contemporaries referred to them). By 1920 only 75 banks were left in the U.K., of which just 20 were English or Welsh public (also known as 'joint-stock') banks (see Capie and Rodrik-Bali (1982) and *The Economist's* Banking Supplement).[6]

In a similar manner to the merger and acquisition wave in U.S. banking during the 1980s and 1990s, the U.K. merger wave was promulgated by technological developments. There was a spread of financial and general journalism, along with improved accounting techniques and the widespread publication of balance sheets (see Collins and Baker (2003)). These factors provided broader access to information for prospective lenders. The expansion of railways, telegraph, and (later) telephone lines and the spread of head office 'best practice' managerial techniques (see Collins and Baker (2003)) brought the various British provinces 'closer' to London and offered fast new ways to transmit information. Such developments facilitated banks' access to new markets.

The merger wave was mostly characterized by London-based banks (and provincial banks that had relocated to London) taking over other banks. Large provincial banks would often take over a London-based bank which was a member of the clearing house (in order to obtain clearing house membership), and then subsequently relocate to London. In this way Barclays, Lloyds, and Midland Bank all became London-based. Over the period 1885 to 1905, takeovers of private and small targets were more common and the two merging banks' branch networks were usually geographically diverse. During the second twenty years, targets were mostly large public banks, which operated in the same geographical area as the bidder. Houston, James, and Ryngaert (2001) document a similar pattern in the recent U.S. bank merger movement. Market expansion mergers were more common in the 1980s, whereas in the 1990s local competitors were more likely to be acquired. The British consolidation process was almost entirely driven by voluntary mergers, although a few smaller banks were taken over while in financial distress. After the outbreak of World War One mergers required the assent of Treasury, which was always given. The result of this process was the emergence of the 'Big Five' banks in Britain by 1918: Barclays, Lloyds, Midland,

[6]Mergers could consist of multiple banks, for example 20 private banks combined in 1896 to form Barclays.

National Provincial, and Westminster. The concentration of banking power generated fears of increased monopoly power in the financial industry. Scholars have defined the British banking industry in the interwar period as: "a highly cartelised and rigid system" (Griffiths (1973) p. 3, see also Capie and Billings (2004)). On April 14, 1919, the government presented to Parliament the Joint Stock Banks Amalgamation Bill.[7] If approved the bill would have made amalgamations subject to the approval of the Board of Trade and Treasury, forbidden interlocking directorships, and banned the sale of any bank assets to a rival bank. Discussion of legislation restricting mergers proceeded for years in Parliament (e.g., November 19, 1919, April 13, 1921, and February 26, 1924) although none was ever passed. During the 1920s approval for bank mergers was vested with Treasury and the Board of Trade (see Hansard February 26, 1924), and the Federal Reserve commented in 1930 that (p. 21): "in recent years the (British) banks, realizing the strength of public opinion, have made few proposals for further amalgamations."

Table I shows that in 1870 and 1880 the top 10 banks in the U.K. had a share of about 31-32% of total deposits: this figure grew to 74% by 1920. The increasing concentration is more evident if we examine only England and Wales: in 1870-1880 the top 10 banks controlled about 30-35% of deposits; this figure increased to 96.6% by 1920. The results are similar if we measure concentration as a proportion of deposits controlled by the top 5 banks: in the U.K. this figure increased from 19.6% in 1870 to 65.5% in 1920, and in England and Wales from 25% to 80%. The deposits Herfindahl index, which measures industry concentration, increased from 0.014 in 1870 to 0.091 in 1920 for the U.K. and from 0.017 to 0.125 if we measure just England and Wales (see Table II). In 1870 the U.K. banking system resembled the dispersed system of Germany in the late 1990s (see Table III), whereas in 1920 the British system was closer to countries that have a high contemporary degree of concentration, such as Belgium and the Netherlands.

[7]Hansard record of parliamentary proceedings (available at hansard.millbanksystems.com).

3.2 Negotiations

Mergers and acquisitions between two joint stock banks during this era involved the full acquisition of the shares of the target firm. M&A negotiations were conducted in private between the two banks' boards of directors. There were no tender offers nor hostile takeovers.[8]

While we do not have data on the duration of negotiations for each merger in our sample, the available anecdotal evidence suggests that negotiations were concluded quickly and that they were carried out solely by the directors or the partners of the involved banks. For instance, in 1897 over the course of a month the London and Midland bank carried out amalgamation agreements with two banks: the Channel Island Bank in Jersey and the Huddersfield Banking Company (see Holmes and Green, 1986, p. 94). More complex negotiations (usually involving larger targets) may have taken a bit longer. For instance, the deal between the London and Midland Bank and City Bank was signed in October 1898, following negotiations which started during the summer of the same year (see Holmes and Green, 1986, p. 97). We believe that the fast timing of the negotiations together with their confidential nature explain the absence of significant share prices run-ups prior to the public announcement of a merger that we document later.

When an agreement had been reached, letters were immediately mailed to both sets of shareholders. An article almost always appeared in the London newspaper *The Times* within a day or two of the agreement. Both firms' shareholders had to formally vote to accept the proposal reached by their boards. The process leading to the approval was extremely fast: within two months of the date of the directors' provisional agreement, shareholders met in an extraordinary general meeting and approved the deal. In our sample the average time between the date of the directors' provisional agreement and the shareholders' approval is about one month and in some cases it is as short as two weeks.

Despite the absence of hostile bids, the M&A market was competitive. Target directors were careful to evaluate the proposed terms of the deal, and they could walk away if the

[8]The absence of hostile takeovers makes our sample similar to takeovers that took place during the 1990s (see Andrade et al. (2001)).

terms were not satisfactory. , for instance, entered into negotiations for the acquisition of Stuckey's Banking Company exited negotiations with the London and Midland Bank in 1909 in favour of an approach by Parr's Bank (see Holmes and Green (1986) p. 125). London and Midland also missed a chance with Wilts and Dorset Bank, which was later acquired by Lloyds (Holmes and Green p. 125).

A major advantage of our study is that the timing of information release is precise. Negotiations appear to have been kept secret, usually until the very end (although we find a handful of merger 'rumours' that appear in *The Times* a day or two before the official announcement). In addition, the event itself is clearly defined, the release of the boards' provisional agreement was the key event and the subsequent events were completed very quickly and with near certainty.

4 Data

We locate the banks involved in M&As from Capie and Webber (1985). We supplement their list of mergers with information obtained from *The Times*, Sykes (1926), and bank archives. We obtain the announcement dates and some details of the provisional agreements from the *The Times* and *The Manchester Guardian*. We take the full merger details (e.g., amount paid for the target, whether in shares or in cash, whether the directors/partners receive a seat on the bidder's board etc.) from the provisional agreements located in the archives of Barclays, Lloyds, HSBC, and Royal Bank of Scotland.

Data on bank profitability, the number of shareholders, assets, liabilities and the branch network were retrieved from *London Banks and Kindred Companies*, *The Banker's Magazine*, and *The Banking Almanac*. We obtain balance sheet information from *The Economist's* banking supplement, published semi-annually in May and October. We construct the entire branch networks for all banks in England and Wales annually between 1885 and 1925. Unfortunately, shareholder lists in the archives are very rare; as a result we cannot construct a direct measure of ownership concentration.[9] Following the literature (see Brav (2009)) we

[9]Turner (2009) suggests that the removal of unlimited liability for banks in 1879 implied that the directors

proxy ownership concentration using the number of shareholders of each bank. We also construct a measure of ownership concentration, Capital Issued per Shareholder, defined as the nominal value of common equity issued divided by the number of shareholders, or partners for private banks.

Of the 173 mergers, 95 (55%) involve public bidders taking over public targets and 78 (45%) involve public bidders taking over private targets. 114 deals were concluded between 1885 and 1905 and a further 59 between 1906 and 1925. We only select deals that involve public exchange-listed bidders, since we can only calculate returns for these banks.[10] We define public banks in the same way as *London Banks and Kindred Companies* and *The Banking Almanac* define them; those banks which issued tradeable shares to the owners, and had a board of directors, rather than partners. The overwhelming majority, but not all, public banks were also listed on a stock exchange. We present summary statistics, at the time of the merger, in Table IV. Panel A shows that the bidding bank was, on average, around six times as large as a public target bank, and nearly 35 times as large as a private target bank. 12% of target banks were considered in financial distress (according to at least one of Crick and Wadsworth (1936), Sayers (1957), Holmes and Green (1986), Ackrill and Hannah (2001), and Orbell and Turton (2001)) at the moment of the acquisition. Bank profitability, measured as return on equity (ROE), is slightly higher for the acquiring bank, and this difference is most pronounced when the merger is between two public banks. The acquiring bank had roughly five times as many shareholders as the target. In addition, acquiring banks tended to merge with banks that had more concentrated ownership, measured as Capital Issued per Shareholder. Roughly 76% of acquisitions were entirely (or almost entirely) paid for in shares, a number in line with the figures presented by Houston and Ryngaert (2001) for the modern U.S.[11] Takeovers of public banks were more likely to be paid for in shares

spent less care in 'vetting' shareholders, and (p. 6): 'many banks ceased to maintain detailed shareholder and share-trading records after the 1880s.'

[10]There were several private banks taking over, or merging with, other private banks. Sykes (1926) finds one instance of a private bank taking over a public bank in 1890.

[11]It was common to use cash payments in conjunction with payments in shares to 'round out' the payment. For example, when Barnsley Banking Co. was taken over by York City and County Bank, Barnsley Shareholders received one York City share (with a market value of £11 and 9 shillings) plus £1 and 11 shillings

(88%) rather than acquisitions of private targets (57%). Following the method of Houston and Ryngaert (1994) we construct a measure of branch overlap. The measure is defined as:

$$Overlap = \frac{\sum_{i=1}^{n} \min(T_i, B_i)}{\sum_{i=1}^{n} (T_i + B_i)}$$

where n is the number of counties in which either bank had branches, T_i is the number of branches of the target in county i, and B_i is the number of branches of the bidder in county i. *Overlap* thus varies from zero (no overlap of branches) to 0.5 (perfect branch overlap). We find that mergers between overlapping banks increased through time, and mergers with private banks had more overlap then mergers with public banks. The value of *Overlap* for merging banks in our sample, 0.02, is slightly lower than the overlap of merging American banks in Houston and Ryngaert's study, 0.028, although they use cities as their unit of observation, rather than county. We place each bank branch into one of the 54 historic counties of England and Wales, using the Association of British Counties' *Gazetteer of British Place Names*.[12]

In Table IV Panel B we present additional summary statistics that we construct for public banks. Around 27% of all public banks were headquartered in London, with this percentage increasing over the decades as London-based banks took over provincial banks. The process of expanding the branch network proceeded over the 40 years of our study, the average bank had branches in 4.29 counties in the first decade and in almost 23 counties by the end of our sample. Banks held around 14% of their assets as cash. We use the same definition as Collins and Baker (2003), which they term 'cash and near-cash'.[13] Banks held more cash at the end of our sample, although this is mainly due to increased cash reserves during the First World War. Investments in marketable securities averaged around 18% of bank assets, rising slightly towards the end of the period. Banks were very conservative in their investments, and Collins and Baker (2003) argue that (p. 63): 'investments remain dominated by British

in cash for each Barnsley share. We treat cases such as this as an example of payment in shares.

[12] www.gazetteer.co.uk. We treat the North, East, and West Ridings of Yorkshire as separate counties.

[13] Some banks list cash as 'notes and coins', some as 'notes, coins and deposits at the Bank of England', and others as 'notes, coins, deposits at the Bank of England and deposits with other banks'. We treat all of these balance sheet items as 'cash'.

central government and municipal 'stocks' (i.e. municipal bonds), colonial (and overseas) public sector bonds, and railway sector bonds or (less often) railway preference shares.' The authors calculate in Table 4.2 the share of investments composed of British government debt, British municipal debt and Colonial (e.g., Australian, Canadian, Indian, and New Zealand) debt as a percentage of all investments. They find that Metropolitan Bank held around 80% of its investments in this category between 1889 and 1913, London and Westminster around 85% between 1892 and 1908, and the London and Midland Bank a little under 70% from 1889 until 1913. We find that bank loans comprised a little under two-thirds of bank assets, although this amount was sharply reduced during the war. Banks did not publicly disclose (nor keep reliable internal records) that permit any disaggregation of loans. Collins and Baker (2003) state that (p. 68): 'there is no breakdown as to the duration of loans, nor as to the distribution between different sectors of the economy ... until obliged to do so in the early 1930s before the Macmillan Committee.' Capital, at book value, fell from 19.2% of assets in the first decade to 7.8% in the final decade. The market value of capital, as a percentage of (the book value of) assets, fell from 26.7% to 11.9% in the period 1916-1925. The average bank size increased enormously over the period, with the book value of assets per bank rising from £5.2 million in the first decade to £101.8 million in the final decade.

We obtain monthly share prices from the *Investor's Monthly Manual* (IMM). The IMM recorded the prices, dividends, and issued capital for banks, railways, and industrial companies. The IMM reports share prices at the end of the month. It would be possible to collect daily data on London-listed joint-stock banks, however more banks were listed on provincial exchanges until the early 20th century than in London. Data for provincial exchanges are virtually impossible to obtain which requires us to rely on the IMM which has both London and provincial price data.[14] We use the IMM's share prices to construct a value-weighted market index as well as the other three Fama-French risk factors. Banks comprised 15.0% by value of the market in 1925 (20.8% in 1900), railways were 14.3% in 1925 (48.1% in 1900), insurance 7.0% (2.0%), breweries 7.7% (1.4%), utilities 6.0% (10.3%), iron and coal

[14]The provincial banks in our sample were listed on the Birmingham, Bradford, Bristol, Cardiff, Halifax, Leeds, Liverpool, Manchester, Sheffield, and Swansea exchanges.

4.0% (5.8%), shipping 2.5% (0.8%), plantations 1.7% (0.1%), and industrials 41.8% (10.3%). Figure 4 shows the market index (excluding banks) and the bank index from 1885 until 1925.

5 Results

5.1 Which banks were involved in M&As?

We investigate which banks became involved in the merger wave, either as bidders or as targets. To study this we run a probit model with the dependent variable equal to one if the bank was a bidder (target) and zero otherwise. Our unit of observation is a bank-year.

We present the results in Table V, where we split the sample along the dimensions of bidder/target, public/private bank, and by sub-sample (1885-1905 and 1906-1925). We find that bidders (columns (1)-(3)) tended to be more profitable, London-based, and larger. These banks usually held more loans as a percentage of assets, were present in more counties, and were more highly valued (measured with Tobin's Q).

Target banks (columns (4)-(9)), on the other hand, tended to be smaller and headquartered outside London. A bank that was less profitable, measured by ROE, was more likely to be a takeover target. Targets tended to hold more deposits as a percentage of assets, which perhaps made them a cheap source of funds. Banks that were taken over were less likely to hold a high ratio of loans to assets, and were less likely to be present in many counties. We also consider membership of the clearing house, as scholars have stressed the importance of gaining access to it as a motivation for pursuing a merger (e.g., Capie and Billings (2004) p. 75). We find that members of the clearing house were more likely to be targets in the first half of our sample (1885-1905). During this period the smaller members of the clearing house were acquired by large provincial banks, which therefore became members of the clearing house themselves. Public banks were less likely to be targets than private banks.

5.2 Bidder Returns

We use an event study approach to assess the impact of merger announcements on banks. For each merger announcement we calculate the abnormal return of the bank using the market model (alpha and beta are estimated with data from 29 months before to 3 months before the merger announcement). The results for bidders appear in Table VI. We calculate the average bidder abnormal return over the announcement month as 0.74%, which is statistically significant at the 1% level.[15] Abnormal returns are larger in the first two decades of our sample: 1.03% from 1885 until 1905, which is statistically significant at the 1% level, versus 0.17% which is not statistically significant for the period 1906 to 1925. Our results are not particularly sensitive to our choice of event window. If we consider the cumulative average abnormal return ($CAAR$) from the start of the month before to the end of the month of the announcement, (-1,0), we find that our estimate increases from 0.74% to 0.90%. If we instead change the event window to the start of the month of the announcement to the end of the month after the announcement (0,+1) we calculate a $CAAR$ of 0.75%.[16]

The positive abnormal returns we document for bidding banks, differ from Houston and Ryngaert (1994), -2.3%, and Houston et al. (2001), -3.5%. It also stands at odds with much of the M&A literature for non-financial firms. For example, Savor and Lu (2009) find negative wealth effects for acquirers with share offers, -3.3%, and slightly positive (but non-significant) wealth effects for cash offers, +0.3%. Our results are consistent with two, non-mutually exclusive, hypotheses: that mergers exploited synergies (e.g. Becher (2009)) and/or that mergers increased the oligopoly power of the bidding bank, leading to an increase in expected profits.

When we distinguish between bidders which acquired a private target versus bidders which acquired a public target, we find strong wealth effects for the latter cases, possibly

[15] We re-run all of the event study analysis using the Dimson (1979) correction for thin trading, with different specifications of the lead-lag process. Our results are little changed. We also calculate abnormal returns forcing a zero intercept (α) and a slope coefficient of one (β). Results are again little affected.

[16] In addition to computing t-statistics we also compute the rank statistic of the abnormal returns, in case abnormal returns are not distributed normally. The results are basically unchanged, abnormal returns are highly statistically significant in the month of the announcement.

because public targets were on average substantially larger (see Table IV, Panel A). When a bidder took over a public bank the bidder experienced a positive abnormal return of 0.95%, statistically significant at the 1% level. On the other hand, the acquisition of a private bank results in a smaller wealth effect, 0.47%, which is statistically significant at the 5% level. Our result differs with results for the 1980s and 1990s that involve non-financial companies. Chang (1998) and Faccio, McConnel, and Stolin (2006) find positive abnormal returns for bidders that acquire private targets and near zero abnormal returns for bidders that acquire public targets.

5.3 Targets and Combined

We also perform the event study analysis for public targets. Our sample includes 94 M&As that involved public targets. For these M&As we could retrieve asset prices for 82 targets. The results for target banks appear in Table VI Panel B.

The results indicate positive wealth effects for targets, on average 6.6%, statistically significant at the 1% level. When we divide the sample in two, we find a positive wealth effect of 3.3% between 1885 and 1905, and a much larger effect between 1906 and 1925, 10.9%, both statistically significant at the 1% level.

These findings are in line with the findings of other studies that report significant positive returns for target banks (see e.g., Becher (2000) and Cornett et al. (2000)), although the wealth effects we find are lower. Houston and Ryngaert (1994) report a higher average positive wealth effect for target banks, 14.3%, estimated in an event window of five days.

The results for the total wealth effect (the weighted average of the bidder and the target) are in Table VI Panel C.[17] In the full sample the combined value change was 2.1%. The value created, 2.6%, was larger in the second period (1906-1925), when the banking sector was becoming more and more concentrated, than in the first period, 1.7%.

[17]The combined wealth effect is computed as $\sum_{t=1}^{T}\left(\frac{MV_B(1+AR_{B,t})+MV_T(1+AR_{T,t})}{MV_B+MV_T}\right)$, where MV_B and MV_T are the market values of the bidder and the target two months before the announcement and AR_t are the abnormal returns in month t.

5.4 Information Leakages and Price Run-ups

Although our reading of the historical literature suggests that merger negotiations were kept private, there may have been a circle of insiders who knew about, and traded on, the progress of merger negotiations. Insider trading was perfectly legal in the U.K. until 1980 (see Bhattacharya and Daouk, Table I (2002)). We check for information leaks by examining the $CAARs$ of bidders and targets before the announcement. Table VII panel A shows the $CAARs$ for bidders and listed targets during the 24 months preceding the announcement.

The bidder bank's $CAARs$ are both close to zero and statistically insignificant during the two years prior to the merger announcement, which indicates that little or no advance knowledge of the M&A offer was available to the market. The $CAARs$ for bidder banks is very negative, -8.4%, two years before the merger and, although this effect is not statistically significant, it was possibly a sign to the market that the target bank was poorly managed which caused other banks to start the merger process.

To investigate the possibility of information leaks weeks (rather than months) before the official announcement we collect bidders' weekly share prices for a subsample of 35 M&As between 1893 and 1907. We study bidders' abnormal returns since most targets were not listed in London. The abnormal return for the bidder was zero two weeks before the announcement, 0.1% (not statistically significant) the week before, and 0.25% (significant at the 1% level) in the week of the announcement. The evidence suggests that merger negotiations were kept secret until the official announcement by the boards of directors, despite the absence of insider trading rules. Our results contrast with those of Banerjee and Eckard (2001). They study the first merger wave in the U.S., 1897-1903, and they discover that pre-announcement price run-ups are a little over 50 percent, which is comparable to that observed in studies of modern insider trading.

In Panel B we check if there was unusual trading activity in London in the target's shares in the weeks before a merger announcement (see Table VI, Panel B). We use *The Times* to count the number of individual trades in the target bank from 51 weeks before the announce-

ment to 4 weeks after the announcement.[18] The newspaper only reports transactions made on the London Stock Exchange. Since the majority of targets were private (ie. unlisted) or provincial public banks (which were mostly listed on regional exchanges) we can only collect data on eight mergers, although almost all of the 20th century 'mega-mergers' are included in this sample. We calculate the average number of trades from 51 to 6 weeks before (the control sample), from 5 weeks before until 1 week before (the pre-announcement period) and from the week of the announcement until 4 weeks after (the post-announcement period). We find strong evidence of unusual trading activity in the pre-announcement period for the two targets in the 19th century, City Bank and Consolidated Bank, with trading activity increasing roughly five-fold. However, during the 20th century there is virtually no evidence of information leakage. Trading activity during the pre-announcement period is virtually the same as during the control period, and often lower. After the public announcement of the merger trading activity usually picks up substantially.

The literature on mergers and acquisitions suggests that information disclosure can not be precisely timed. Keown and Pinkerton (1981) and Malatesta (1983) find positive cumulative abnormal returns in the period preceding the official announcement. Acharya and Johnson (2010) find evidence of suspicious equity market activity associated with private-equity buyouts, moreover there tends to be more suspicious activity, pre-announcement, the greater the number of equity participants in the deal.

Our results confirm the historical accounts which suggest that little information leaked from directors' negotiations. Secrecy was possible perhaps because the circle of confidants was very small. Therefore the public announcement was the relevant information disclosure event as far as the market was concerned, and our announcement window precisely captures the effect of information release.

[18] We only collect the number of trades each Thursday, rather than daily data.

5.5 Determinants of Abnormal Returns

We now turn to the question of what constituted a 'good' deal, where 'good' means value enhancing for the shareholders. To assess this we regress the abnormal returns of the bidders, targets, and a value-weighted combined figure in the month of the M&A announcement on various characteristics as well as controls for various measures of ownership concentration.

In Table VIII we present results for the combined (deal) abnormal returns.[19] We find clear support for the restructuring hypothesis, poorly performing banks (low target ROE) were attractive takeover targets since a bidding bank could expect to reform their sub-optimal practices. There is also some evidence that profitable bidders (high bidder ROE) were associated with successful value creation, which suggests that well-run banks were adept at choosing targets.

5.6 Were Mergers Anti-Competitive?

We now study if a merger of two banks had an industry-wide impact. There are, in principle, three possible effects of mergers on rival (that is, uninvolved) banks. First, mergers may increase the profitability of the surviving banks if there is a reduced amount of product market competition. Since there will be fewer banks in the market post-merger, in principle anti-competitive activities should be easier to coordinate.[20] This effect implies a positive relation between merger announcements and the abnormal returns of rival banks. Secondly, a merger announcement may convey information about the possibility of merging to other banks, its acceptance by customers and shareholders, and any cost savings that mergers can bring, which again implies a positive association between announcements and rival banks' abnormal returns. Finally, the merged bank may be a larger, more efficient competitor for rivals in the product market, which implies a negative impact on rivals' abnormal returns.

We employ Eckbo's (1983) method to check whether a decrease in competition played a

[19] Results for bidders and targets are similar and available upon request.

[20] We would like to measure anti-competitive behaviour as the interest rate differential between lending and borrowing. However, banks in the late nineteenth and early twentieth century did not report this information in their financial accounts.

role in determining the positive wealth effects of mergers. We examine the abnormal returns of uninvolved banks (also referred to as rival banks, i.e. those not participating in the merger) at the time of each merger announcement in Table IX, Panel A. We estimate betas individually for each uninvolved bank, we calculate $CARs$ and the cross-sectional average ($CAAR$) in the announcement month.[21] In the full sample (1885-1925) we find that in the month of a M&A announcement uninvolved banks gained, on average, 0.14% which is statistically significant at the 1% level. Acquisitions of public banks tended to be associated with higher returns for uninvolved banks (because public banks tended to be larger than private banks). The distribution of these gains is however different from period to period. Most of the gains to uninvolved banks came in the post-1915 period, when news of a merger was associated with a 1.6% abnormal return for uninvolved banks, statistically significant at the 1% level.[22] The post-1915 period was when the HHI of banking concentration (see Figure 2) was at its peak. Higher returns for uninvolved banks during the period of mega-mergers is consistent with the idea that most of the gains to shareholders during this period came at the expense of decreased bank competition. We believe that it is unlikely that these gains are due to information transmission about the possibility of merging. As the gains for uninvolved banks are concentrated in the last part of the time period, the information hypothesis would imply that banks needed roughly thirty years to learn about merging possibilities and ways to effect synergies.

In Table IX, Panel B we regress the abnormal returns of uninvolved banks in an announcement month on various characteristics of the merger. We quantify the local compe-

[21]To account for any contemporaneous cross-correlation of returns, that may bias standard errors down, Eckbo (1983) pools the rivals of each merger into one equally weighted industry portfolio. We follow Petersen (2008) and cluster the standard errors. We cluster standard errors along various dimensions: merger bank, uninvolved bank, and both merger and uninvolved bank. Our results do not change in any dimension. In Table IX, we present the results with standard errors clustered by uninvolved bank.

[22]We find evidence of positive abnormal returns for uninvolved banks a month or two before the public merger announcements in the post-1915 period, which is consistent with some information leakage. There was widespread speculation in the media of additional bank mergers during the First World War. Abnormal returns in non-merger months (excluding the months immediately before the merger announcements) are close to zero and statistically insignificant, that is we do not obtain false positives with this method.

tition faced by a bank in a certain year with $Bank\ HHI$.[23] $Bank\ HHI$ is a bank-specific weighted average of county-level $HHIs$, where the weights are given by the fraction of the bank's branches in a particular county. A higher(lower) $Bank\ HHI$ means that the bank is present in more(less) concentrated markets.[24] We then construct $\Delta Bank\ HHI$ as $Bank\ HHI_{i,j,POST}$ - $Bank\ HHI_{i,j,PRE}$ where $Bank\ HHI_{i,j,PRE}$ is the $Bank\ HHI$ of rival i before merger j took place and $Bank\ HHI_{i,j,POST}$ is the $Bank\ HHI$ of rival i after merger j has been completed. We add as a control the probability that the uninvolved bank will itself get acquired in the future, along the lines of Song and Walkling (2000). This control should capture any price increase of an uninvolved bank purely due to its likelihood of receiving a merger premium in the future, which is unrelated to changing market concentration. We compute the probability using the probit model presented in Table V, column 7.

We find a positive relation between $\Delta Bank\ HHI$ and the abnormal return for an uninvolved bank. Uninvolved bank shares increased in value most when the market experienced a big increase in concentration. We believe that this effect comes from the greater ability of banks to facilitate and maintain collusive agreements. The economic effects are sizable; a standard deviation increase of $\Delta Bank\ HHI$ corresponds to a 0.05 percentage point increase in rival banks' abnormal returns which is equal to a 36% increase. The control for the uninvolved banks' probability of being acquired (in the future) is positive, but not statistically significant. Therefore, the positive abnormal returns that we find for uninvolved banks cannot be explained as being driven purely by the increase in probability that those banks will themselves become targets in the future. The variables Public Target and Deal Size both capture size related effects that cannot be directly attributed to market concentration. The more economically important the proposed merger the larger is the abnormal return for the

[23]Measures of industry concentrations based on HHI have been criticized as poor proxies for competition (see e.g., Claessens and Laven (2004)). Unfortunately, we do not have enough information on banks' costs and revenues to construct other industrial organization based proxies of competition such as used by Schaeck et al. (2009) and Schaeck and Cihak (2010).

[24]For example, the Bank of Liverpool in 1885 had branches in three counties: Cheshire (1 branch), Lancashire (8 branches) and Westmorland (1 branch). The HHI for Cheshire in 1885 was 0.16, based on all banks present in Cheshire, for Lancashire 0.067, and for Westmorland 0.34. $Bank\ HHI$ for Bank of Liverpool in 1885 was 0.103 : $\frac{1}{10}$*0.16+$\frac{8}{10}$*0.067+$\frac{1}{10}$*0.34.

uninvolved banks. We add the variable Uninvolved Bank's Loans/Assets and Uninvolved Bank's Capital/Assets and to capture any 'lender of last resort' effects. If one (side-)effect of a merger was to increase the probability that the Bank of England or the government would step in to support any commercial bank in times of crisis then we might expect riskier banks to benefit most from this implicit increase in support. We find some evidence for a 'lender of last resort' effect, uninvolved banks with more loans to assets benefit the most from an announced merger. However, the effect of $\Delta Bank\ HHI$ on abnormal returns is over and above what can be attributed to an increase in the probability of a bank bailout in times of trouble.[25]

An alternative explanation that has been suggested for our results on rival banks is that a substantial number of loan officers may have left the target bank immediately after the merger took place, to work for a rival bank. The market may have priced this favourably, by recognizing that these loan officers carried with them information about borrowers and local credit market conditions that could have given important advantages to the uninvolved banks. We collect data on the branch managers of target banks for a random sample of 18 mergers. We retrieve the names of the branch managers the year before the merger and the year after the merger (when the target's branches had been incorporated into the bidder bank). Of 855 target branch managers, 755 (88%) retained their exact position in the new merged entity, 74 (9%) were replaced by new managers and either left the target bank or changed position, and 26 (3%) target managers had their branch closed. Since the vast majority of managers kept on working in their original position, we consider this alternative explanation for the positive reaction of uninvolved banks to be unlikely.

A final test is to measure banks' abnormal returns in response to proposed legislation that was intended to restrict mergers in the banking industry, the Joint Stock Banks Amalgamation Bill. In April 1919, the Liberal government introduced this bill to the House of Commons with the intention of restricting M&As in the banking industry. Although the

[25]It is not surprising that the lender of last resort effect is small in our sample. Banks did not borrow large amounts of funds from each other making systemic risk small. The use of wholesale funding was extremely limited and most of the liabilities of banks consisted of deposits.

bill was never voted on, it would have prevented banks from further mergers or partial asset sales. In April 1919 banks experienced negative wealth effects of about -0.7%, statistically significant at the 5% level.[26] London banks, which were in general more active in the takeover market and hence more exposed to the bill's provisions, experienced slightly worse abnormal returns, -0.8%, statistically significant at the 10% level.

5.7 Long-run Impact of Mergers

We now measure the long-run effects of mergers on the bidding bank, to see if investors' positive expectations (on average) about the success of a merger eventuated. We use the calendar-time portfolio approach which is standard in the literature (see e.g., Savor and Lu (2009)). We construct portfolios, rebalanced monthly, of banks which had taken over any target (or any public target) in the previous 12 (or 24) months. We calculate equally-weighted portfolio returns and then regress portfolio returns on first the market return less the risk-free rate and second the four Fama-French factors (see Table X).[27] The intercept, known as alpha, shows the abnormal return on the portfolio of acquirers.

The results show that, regardless of specification, the abnormal returns of acquiring banks are statistically insignificant and economically tiny in the period after they have completed a merger. The market does not, on average, suffer any post-merger regret (a negative alpha) or find any unexpected synergies from the merger (a positive alpha). We also restrict the sample to firms that paid for acquisitions with equity only (not shown), in case firms with overvalued equity were prone to acquire other banks (and pay with shares rather than cash). The results are unchanged, alpha remains slightly positive but statistically insignificant.

[26] An alternative interpretation to a story of poor returns due to prevented M&A activity is that banks' share prices were reduced due to the (proposed) restrictions on the resale of their assets.

[27] The risk free rate is the Bank of England *Bank Rate* which comes from 'Tabular History of the Money Market' which is located in the December issues of the IMM.

5.8 Real Effects of Mergers

Banks may exploit increased concentration by reducing price competition (e.g., raising loan rates and lowering deposit rates) or reducing non-price competition (fewer bank services offered). More expensive, or less available, banking may have an effect on the economy in which those banks operated. Unfortunately, data on interests rates applied to loans and deposits are not available for our time period.

We assess what, if any, effect bank mergers had on the local (county) economy in which they operated. County-level data are sparse in this period of history. We therefore examine the effect on employment levels, measured once per decade (from Lee (1979)) of changing bank concentration in that couty. In Table XI, columns (1) and (2) we show that increased banking concentration is robustly associated with a decrease in the employment to population ratio in a county. [28] The effects are economically important, a one s.d. increase in county HHI results in a one percentage point decrease in the employment to population ratio in that county. The decrease in the employment to population ratio is due to some combination of working age people moving to counties which have less bank concentration and/or an increase in the unemployment rate in that particular county.

In columns (3) and (4) we regress a measure of bank service, the average number of people per bank branch in a county, on bank HHI and various controls. We find that counties with higher levels of bank concentration tend to have lower levels of bank service (ie., more people per branch). This suggests that in a more concentrated market banks refrain from some forms of non-price competition. The economic significance is large, a one s.d. increase in county HHI results in a 20% increase in the number of people per branch.

[28] Since we only observe total population in a county, not working age population, employment to population ratios cannot be calculated in an identical way to modern usage.

6 Bank Behaviour

The banking system is tightly linked via the credit channel with other sectors of the economy, therefore the impact of increased market concentration on bank behaviour is a cause for concern. We infer changes in bank behaviour by measuring the impact of mergers on bank balance sheet ratios. We present the ratios for public banks that operated in England and Wales in Figure 3.[29] Loans over assets declined by about 10 percentage points over our sample period, whereas cash over assets and investments over assets increased by about 5 percentage points. Book and market capital ratios halved during the sample period, from 28% of assets to 14% and from 20% to 10% respectively. By the end of the period banks' capital ratios were very close to modern U.S. capital ratios (see Berger et al., 2008).[30] Such a large decline in capital ratios could be due to the geographic expansion of the banking activity and the risk diversification benefits such an expansion brought to banks. Alternatively, the decline in capital ratios may be due to other factors. Grossman (2007) documents a decline in banks' capital ratios in 12 developed countries over roughly the same time period. He attributes some of this decline to a decline in economic risk during the gold standard.

In Table XII we present regressions of bank ratios on various characteristics. Each observation is a bank-year. In columns (1)-(4) we show the OLS results (which include year and bank fixed effects) and in columns (6)-(9) we present two stage least squares (2SLS) estimates, where we use *Bank HHI* in 1885 (the start of our sample) as an instrument for the amount of contemporaneous local industry concentration. Unfortunately, we cannot rely on natural experiments to identify a causal relation between local concentration and banks' balance sheets. For instance, changes in legislation affected each region in the same way. Our identification assumption is that the *Bank HHI* in 1885 is a good predictor of *Bank HHI* in subsequent years and hence affects the degree of local concentration, but it has no direct effects on that bank's financial ratios.[31]

[29] These data include all public banks that publicly reported their balance sheets (only a handful of small public banks did not report balance sheet data). The data exclude private banks and all other non-bank financial institutions.

[30] Neither our figures nor the figures presented by Berger et al. take into account off balance sheets items.

[31] We do not present the results of the first stage regression. The coefficient on *Bank HHI* is negative

We use the 2SLS procedure to alleviate problems of reverse causality from balance sheet ratios to bank concentration, for example banks with a higher cash to assets ratio may have been more easily able to take over rival banks, which would increase *Bank HHI*. The results indicate that banks in more concentrated markets tended to reduce their cash holdings and loans and to increase their investments in marketable securities. The economic effects are sizeable; the 2SLS results indicate that a one standard deviation increase in lagged *Bank HHI* results in a 2 percentage point decrease in the cash/assets ratio (equal to a 10% decrease from the mean), a 6 percentage point (32%) increase in the investments ratio, and a 4 percentage point (29%) decrease in the loans ratio. Given that investment portfolios were heavily weighted towards (low risk) government bonds, the dominating effect of more concentration seems to be less risk taking, since less credit was extended via loans. More concentration is also weakly associated with lower capital ratios.

The control variables for the 2SLS results indicate that a one standard deviation increase in the log of the number of counties where the bank had branches is associated with roughly a 3 percentage point decrease (16%) in the book capital ratio. More profitable banks (one side effect of increased concentration) were associated with lower book ratios of capital to assets and the holding of more marketable securities and fewer loans. The coefficient on asset growth indicates that faster growing banks tended to have lower capital ratios.

In columns (5) and (10) we regress the standard deviation of monthly equity returns in years t, t+1, and t+2 on lagged *Bank HHI* and some controls. The 2SLS results suggest that as *Bank HHI* increased the standard deviation of that bank's returns decreased. A standard deviation increase of *Bank HHI* reduces the standard deviation of returns by about 7%.

In conclusion, increased bank concentration was associated with fewer loans and increased holdings of government debt, which was likely to have had a net effect of lowering bank risk taking. No major British banks failed during the period of our study (or indeed during the twentieth century), and although the merger wave and the development of a national

and statistically significant at the 1% level. This result suggests that high values of concentration in 1885 were associated with higher future local concentration.

branching system resulted in lower capital ratios, it also influenced banks to hold less risky assets. There is also some evidence that banks that operated in more concentrated markets had less risky equity.

7 Conclusion

We study the shareholder wealth effects for banks during the forty year wave of M&As in the U.K. between 1885 and 1925. Our analysis of this period permits an investigation of M&As over a very long period of time and studies how returns from acquisition deals evolved while the banking industry was becoming more and more concentrated. We study 167 takeovers and we find positive wealth effects for bidders and targets in the month of the M&A announcement. This result is different from studies that use recent data which find zero or negative wealth effects for bidding banks.

As the merger wave progressed, banks uninvolved in a proposed merger experienced a +1.6% abnormal returns in a month in which two rivals announced that they were merging. Increasing market concentration appears to have benefited all banks' shareholders, at the expense of bank customers. Counties with a more concentrated banking system had lower employment ratios and less bank service.

Increased concentration also resulted in a decline in bank loans relative to assets. Tacit collusion may have involved restricting the supply of loans to push up the interest rate that bank customers paid. One positive side effect of increased concentration is that banks became more stable.

References

Acharya, Viral, and Timothy Johnson, More Insiders, More Insider Trading: Evidence from Private-Equity Buyouts, *Journal of Financial Economics*, Vol. 98(3), pp. 500-523, 2010.

Ackrill, Margaret and Leslie Hannah, *Barclays: The Business of Banking 1690-1996*, Cambridge University Press, 2001.

Andrade, Gregor, Mark Mitchell, and Erik Stafford, New Evidence and Perspectives on Mergers, *Journal of Economic Perspectives*, Vol. 15(2), pp. 103-120, 2001.

Ashton, John and Khac Pham, Efficiency and Price Effects of Horizontal Bank Mergers, *CCP Working Paper 07-9*, 2007.

Asquith, Paul, Robert Bruner and David Mullins, The Gains to Bidding Firms from Mergers, *Journal of Financial Economics*, Vol. 11(1), pp. 121-139, 1983.

Banerjee, Ajeyo and E. Woodrow Eckard, Why Regulate Insider Trading? Evidence from the First Great Merger Wave (1897-1903), *American Economic Review*, Vol. 91(5), pp. 1329-1349, 2001.

Barth, James, Gerard Caprio, Jnr., and Ross Levine, The Regulation and Supervision of Banks Around the World: A New Database, World Bank Policy Research Working Paper No. 2588, 2001.

Becher, David, The valuation effects of bank mergers, *Journal of Corporate Finance*, Vol. 6(2), pp. 189-214, 2000.

Becher, David, Bidder Returns and Merger Anticipation: Evidence from Banking Deregulation, *Journal of Corporate Finance*, Vol. 15(1), pp. 85-98, 2009.

Beck, Thorsten, Asli Demirgüç-Kunt, and Ross Levine, Bank Concentration, Competition, and Crises: First Results, *Journal of Banking and Finance*, Vol. 30(5), pp. 1581–1603, 2006.

Berger, Allen, Asli Demirgüç-Kunt, Ross Levine, and Joseph Haubrich, Bank Concentration and Competition: An Evolution in the Making, *Journal of Money, Credit and Banking*, Vol. 36(3), pp. 434–50, 2004.

Berger, Allen, Robert DeYoung, Mark Flannery, David Lee, and Özde Öztekin, How Do Large Banking Organizations Manage Their Capital Ratios?, *Journal of Financial Services Research*, Vol. 34(1) pp. 123-149, 2008.

Berger, Allen, Leora Klapper, and Rima Turk-Ariss, Bank Competition and Financial Stability, *Journal of Financial Services Research*, Vol. 35(1) pp. 99-118, 2009.

Sandra Betton, B. Espen Eckbo, and Karin Thorburn, Merger Negotiations and the Toehold Puzzle, Journal of Financial Economics, Vol. 91, 158-178, 2009.

Bhagat Sanjai, Ming Dong, David Hirshleifer, and Robert Noah, Do tender offers create value? New methods and evidence, *Journal of Financial Economics*, Vol. 76(1), pp. 3-60, 2005.

Bhattacharya, Utpal, and Hazem Daouk, The World Price of Insider Trading, *Journal of Finance*, Vol. 57(1), pp. 75-108, 2002.

Boyd, John, and Gianni deNicoló, The Theory of Bank Risk-Taking and Competition Revisited, *Journal of Finance*, Vol. 60(3), pp. 1329–42, 2005.

Brav, Omer, Access to Capital, Capital Structure, and the Funding of the Firm, *Journal of Finance*, Vol. 64(1), pp. 263-308, 2009.

Calomiris, Charles and Joseph Mason, Fundamentals, Panics and Bank Distress During the Depression, *American Economic Review*, Vol. 93(5), pp. 1615-47, 2003.

Calomiris, Charles and Berry Wilson, Bank Capital and Portfolio Management: The 1930s 'Capital Crunch' and the Scramble to Shed Risk, *Journal of Business*, Vol. 77(3), pp. 421-56, 2004.

Capie, Forrest and Ghila Rodrik-Bali, Concentration in British Banking, 1870-1920, *Business History*, Vol. 24, pp. 280-292, 1982.

Capie, Forrest and Mark Billings, Evidence on Competition in English commercial banking, 1920-1970, *Financial History Review*, Vol. 11(1), pp. 69-103, 2004.

Capie, Forrest and Alan Webber, *A Monetary History of the United Kingdom, 1870-1982*, Allen & Unwin, London, 1985.

Carbó, Santiago, David Humphrey, Joaquín Maudos and Philip Molyneux, Cross-country Comparisons of Competition and Pricing Power in European Banking, *Journal of International Money and Finance*, Vol. 28(1), pp. 115-134, 2009.

Carletti Elena and Philipp Hartmann, Competition and financial stability: what's special about banking? in *Monetary history, exchange rates and financial markets: essays in honour of Charles Goodhart*, Vol. 2. Edward Elgar, Cheltenham, U.K., 2003.

Carlson, Mark and Kris Mitchener, Branch Banking, Bank Competition, and Financial Stability, *Journal of Money, Credit and Banking*, Vol. 38(5), pp. 1293-1327, 2006.

Carlson, Mark and Kris James Mitchener, Branch Banking as a Device for Discipline: Competition and Bank Survivorship during the Great Depression, *Journal of Political Economy*, Vol. 117(2), pp. 165-210, 2009.

Cassis, Youssef, *City Bankers: 1890-1914*, University Press, Cambridge, 1994.

Chang, Saeyoung, Takeovers of Privately Held Targets, Methods of Payment, and Bidder Returns, *Journal of Finance*, Vol. 53(2), pp. 783-84, 1998.

Claessens, Stijn, and Luc Laeven, What Drives Bank Competition? Some International Evidence, *Journal of Money, Credit and Banking*, Vol. 36(3), 563-83, 2004.

Collins, Michael, *Money and banking in the U.K.: A history*, Croon Helm, Beckenham, Kent, 1988.

Collins, Michael, The Bank of England as Lender of Last Resort, 1857-1878, *Economic History Review*, 45(1), pp. 145-153, 1992.

Collins, Michael, and Mae Baker, *Commercial Banks and Industrial Finance in England and Wales, 1860-1913*, Oxford University Press, Oxford, 2003.

Cornett, Marcia, Gayane Hovakimian, Darius Palia, and Hassan Tehranian, The impact of the Manager- Shareholder conflict on acquiring banks returns, Working paper, Boston College, 2000.

Crick, Wilfred and John Wadsworth, *A Hundred Years of Joint Stock Banking*, Hodder and Stoughton, London, 1936.

Cybo-Ottone, Alberto and Maurizio Murgia, Mergers and Shareholder wealth in European Banking, *Journal of Banking and Finance*, Vol. 24(6), pp.831-859, 2000.

De Nicoló, Gianni, Phillip Bartholomew, Jahanara Zaman, and Mary Zephirin, Bank Consolidation, Internationalization, and Conglomerization: Trends and Implications for Financial Risk, *Financial Markets, Institutions and Instruments*, Vol. 13, pp. 173–217, 2004.

Dimson, Elroy, Risk Measurement when Shares are Subject to Infrequent Trading, *Journal of Financial Economics*, Vol. 7(2), 197-226, 1979.

Eckbo, B. Espen, Horizontal Mergers, Collusion and Stockholder Wealth, *Journal of Financial Economics*, Vol. 11(2), pp. 241-273, 1983.

Eichengreen, Barry, *Globalizing Capital*, Princeton University Press, Princeton, 2008.

Faccio, Mara, John McConnell and David Stolin, Returns to Acquirers of Listed and Unlisted Targets, *Journal of Financial and Quantitative Analysis*, Vol. 41(1), pp. 197-220, 2006.

Ferguson, Niall, *The Ascent of Money*, The Penguin Press, New York, 2008.

Fohlin, Caroline, Relationship Banking, Liquidity, and Investment in the German Industrialization, *Journal of Finance*, Vol. 53(5), pp. 1737-1758, 1998.

Fuller, Kathleen, Jeffry Netter, and Mike Stegemoller, What Do Returns to Acquiring Firms Tell Us? Evidence from Firms that Make Many Acquisitions, *Journal of Finance*, Vol. 57(4), pp. 1763-1793.

Goodhart, Charles and Dirk Schoenmaker, Should the Functions of Monetary Policy and Banking Supervision Be Separated? *Oxford Review of Economic Policy*, Vol. 47, pp. 539-560, 1995.

Griffiths, Briak, The Development of Restrictive Practices in the U.K. Monetary System, *The Manchester School*, 41(1), pp. 3-18, 1973.

Grossman, Richard, Other People's Money in *The New Comparative Economic History*, eds. Timothy Hatton, Kevin O'Rourke, and Alan Taylor, MIT Press, Cambridge and London, 2007.

Grossman, Richard, *Unsettled Account: The Evolution of Banking in the Industrialized World since 1800*, Princeton University Press, Princeton and Oxford, 2010.

Holmes, A. R. and Edwin Green, *Midland 150 Years of Banking Business*, Batsford, London, 1986.

Houston, Joel, and Michael Ryngaert, The overall gains from large bank mergers, *Journal of Banking and Finance*, Vol. 18(6), pp. 1155-1176, 1994.

Houston, Joel, and Michael Ryngaert, Equity issuance and adverse selection: a direct test using conditional stock offers, *Journal of Finance* Vol. 52(1), pp. 197–219, 1997.

Houston Joel, Christopher James and Michael Ryngaert, Where do merger gains come from? Bank mergers from the perspective of insiders and outsiders, *Journal of Financial Economics*, Vol. 60(2), pp. 285-331, 2001.

The Investor's Monthly Manual: http://icf.som.yale.edu/imm/

Jensen, Michael, and Richard Ruback, The Market for Corporate Control: The Scientific Evidence, *Journal of Financial Economics*, Vol. 11(1), pp. 5-50, 1983.

Keeley, Michael, Deposit Insurance, Risk, and Market Power in Banking, *American Economic Review*, Vol. 80(5), pp. 1183-1200, 1990.

Keown, Arthur, and John Pinkerton, Merger Announcements and Insider Trading Activity: An Empirical Investigation, *Journal of Finance*, Vol. 36(4), pp. 855-69, 1981.

Lee, C.H., *British Regional Employment Statistics, 1841-1971*, Cambridge University Press, Cambridge (MA), 1979.

Malatesta, Paul, The Wealth Effect of Merger Activity and The Objective Functions of Merging Firms, *Journal of Financial Economics*, Vol. 11(1), pp. 155-181, 1983.

Malmendier, Ulrike and Geoffrey Tate, Who Makes Acquisitions? CEO Overconfidence and the Market's Reaction, *Journal of Financial Economics*, Vol. 89(1), pp. 20-43, 2008.

Mishkin, Frederic, Financial Consolidation: Dangers and Opportunities, *Journal of Banking and Finance*, Vol. 23(2-4), pp. 675-691, 1999.

Moen, Jon, and Ellis Tallman, Clearinghouse Membership and Deposit Contraction During the Panic of 1907, *Journal of Economic History*, Vol. 60(1), pp. 145-63, 2000.

Officer, Micah, Termination fees in mergers and acquisitions, *Journal of Financial Economics*, Vol. 69(3), pp. 431-467, 2003.

Officer, Micah, Collars and Renegotiation in Mergers and Acquisitions, *The Journal of Finance*, Vol. 59(6), pp. 2719-2743, 2004.

Orbell, John and Alison Turton, *British Banking: A Guide to Historical Records*, Ashgate, Aldershot, 2001.

Petersen, Mitchell, Estimating Standard Errors in Financial Panel Data Sets: Comparing Approaches, *Review of Financial Studies*, Vol. 22(1), pp. 435-480, 2008.

Pilloff, Steven, and Anthony Santomero, The value effects of bank mergers and acquisitions, pp. 59-78 in Amihud, Y., Miller, G. (eds), *The Mergers of Financial Institutions*, Kluwer Academic Publishers, Norwall, Massachusetts, 1998.

Pope, Peter, R.C. Morris, and David Peel, Insider Trading: Some Evidence on Market Efficiency and Directors' Share Dealings in Great Britain, *Journal of Business, Finance, and Accounting*, Vol. 17(3), pp. 359-380, 1990.

Reinhart, Carmen, and Kenneth Rogoff, Banking Crises: An Equal Opportunity Menace, *NBER Working Paper No. 14587*, 2008.

Repullo, Rafael, Capital Requirements, Market Power, and Risk-Taking in Banking, *Journal of Financial Intermediation*, Vol. 13(2), pp. 156–82, 2004.

Roll, Richard, The Hubris Hypothesis of Corporate Takeovers, *Journal of Business*, Vol. 59(2), pp. 199-216, 1986.

Saunders, Anthony and Berry Wilson, The impact of consolidation and safety-net support on Canadian, US and UK banks: 1893–1992, *Journal of Banking and Finance*, Vol. 23(2-4), pp. 537-571, 1999.

Savor, Pavel, and Qi Lu, Do Stock Mergers Create Value for Acquirers?, *Journal of Finance*, Vol. 64(3), pp. 1061-1097, 2009.

Sayers, R. S., *Lloyds Bank in the History of English Banking*, Clarendon Press, Oxford, 1957.

Schaeck, Klaus, Martin Cihak, and Simon Wolfe. Are competitive banking systems more stable? *Journal of Money, Credit, and Banking*, Vol. 41(4), pp. 711-734, 2009.

Schaeck, Klaus and Martin Cihak, Competition, efficiency, and soundness in banking:An industrial organization perspective, Working Paper, 2010.

Sayers, Richard, *Lloyds Bank in the history of English banking*, The Clarendon Press, London, 1957.

Smith, Bruce, Private Information, Deposit Interest Rates, and the 'Stability' of the Banking System, *Journal of Monetary Economics*, Vol. 14(3), pp. 293–317, 1984.

Sykes, Joseph, *The Amalgamation Movement in English Banking, 1825-1924*, P.S. King and Son, London, 1926.

Turner, John, The Last Acre and Sixpence: Views on Shareholder Liability Regimes in Nineteenth-Century Britain, *Financial History Review*, Vol. 16, pp. 111-128, 2009.

Table I

British Bank Deposit Concentration, 1870-1920

Sum of the largest banks' deposits divided by the sum of all banks' deposits. Source: Capie and Rodrik-Bali (1982) Table 3.

	Top 10 banks		Top 5 banks	
	U.K.	England/Wales	U.K.	England/Wales
1870	31.0	32.8	19.6	25.0
1880	32.5	36.2	20.6	26.4
1890	32.0	38.0	21.0	26.5
1900	41.0	46.3	25.5	31.0
1910	56.0	64.7	35.5	43.0
1920	73.7	96.6	65.5	80.0

Table II

British Banking Herfindahl Index, 1870-1920

Sum of squared market shares. Market share of a bank is equal to its deposits divided by aggregate deposits. Source: Capie and Rodrik-Bali (1982) Table 4.

	U.K.	England/Wales
1870	0.014	0.017
1880	0.016	0.020
1890	0.017	0.022
1900	0.022	0.029
1910	0.037	0.053
1920	0.091	0.125

Table III

European Banking Herfindahl Index: 1995 - 2001

Sum of squared market shares. Market share of a bank is equal to its deposits divided by aggregate deposits. Source: Carbó et al (2009) Table 1.

	Herfindahl
Belgium	0.12
France	0.04
Germany	0.02
Netherlands	0.13
U.K.	0.04
European Union	0.07

Table IV
Summary Statistics

Assets are in thousands of pounds at book value. Target in Distress equals 1 if the target bank was in financial distress and 0 otherwise. Return on Equity (ROE) equals the previous year's profits divided by the nominal value of paid up capital. # Branches is the number of bank branches. # Shareholders is the number of bank shareholders in the year prior to the merger. Capital Issued/Shareholders equals the nominal value of issued capital divided by the number of shareholders (or partners for private banks) in the year prior to the merger. Overlap ranges from 0 (no branch overlap) to 0.5 (full branch overlap). Payment in Shares equals 1 if the vast majority of the deal was financed by issuing shares to target shareholders and 0 otherwise. Bolded coefficients indicate statistically significant mean differences (between time periods and between private and public targets) at the 5% level. London Bank equals 1 if the bank was headquartered in London and 0 otherwise. Counties Present is the number of counties in which the bank had at least 1 branch. Cash is the value of cash and cash equivalents, Investments is the value of marketable securities, Loans is the value of outstanding loans, and Capital is the nominal value of shareholders' equity, all measured at book value.

Panel A - All Banks, Data as at Time of Merger

	Mean (s.d.) Full Sample	Obs.	Mean (s.d.) 1885-1905	Mean (s.d.) 1906-1925	Mean (s.d.) Private Targets	Mean (s.d.) Public Targets
Assets, £ '000, Bidder	50,764 (75,520)	171	**21,063 (16,314)**	**108,628 (106,448)**	**57,455 (91,492)**	**45,152 (58,847)**
Assets, £ '000, Target	5,282 (12,526)	141	**1,803 (1,902)**	**11,612 (19,450)**	**1,626 (2,580)**	**7,352 (15,202)**
Target in Distress	0.09 (0.84)	166	**0.124 (0.331)**	**0.02 (0.137)**	0.097 (0.298)	0.085 (0.281)
ROE, Bidder	0.108 (0.033)	166	**0.098 (0.018)**	**0.127 (0.048)**	0.105 (0.027)	0.109 (0.038)
ROE, Target	0.098 (0.161)	103	0.101 (0.201)	0.095 (0.021)	0.09 (0.031)	0.082 (0.023)
# Branches, Bidder	248 (249)	171	**141.67 (108.01)**	**445.41 (409.97)**	**275.5 (108.01)**	**226.16 (226.50)**
# Branches, Target	30 (73)	168	**9.90 (11.91)**	**69.42 (116.35)**	**7.135 (108.01)**	**47.54 (93.69)**
# Shareholders, Bidder	8,322 (9,534)	167	**4,542 (3,400)**	**16,452 (12,900)**	7,496 (7,835)	8,979 (10,692)
# Shareholders, Target	995 (2,472	167	**338 (555)**	**15,500 (49,736)**	3.93 (2.12)	1,795 (3,106)
Capital Issued/Shareholders, Bidder (£)	531 (248)	167	**572.6 (261)**	**442.2 (373.4)**	538 (298)	525 (230)
Capital Issued/Shareholders, Target (£)	14,246 (37,195)	137	13,653 (29,778)	589 (591)	39,518 (54,798)	639 (478)
Overlap	0.020 (0.051)	168	0.017 (0.0493)	0.024 (0.052)	**0.07 (0.020)**	**0.03 (0.063)**
Payment in Shares	0.76 (0.43)	152	0.72 (0.45)	0.84 (0.37)	**0.56 (0.50)**	**0.88 (0.324)**

Panel B - All Public Banks (1885-1925)

	Full Sample	1885-1895	1896-1905	1906-1915	1916-1925
London Bank	0.266	0.205	0.246	0.374	0.417
	(0.442)	(0.404)	(0.431)	(0.484)	(0.495)
Counties Present	7.834	4.29	7.150	12.800	22.98
	(12.01)	(6.77)	(9.97)	(14.52)	(22.49)
# Branches	89.94	26.33	62.79	156.8	489.5
	(204.1)	(37.98)	(81.42)	(178.3)	(564.2)
ROE	0.089	0.085	0.088	0.096	0.117
	(0.026)	(0.023)	(0.024)	(0.026)	(0.037)
Cash / Assets	0.141	0.131	0.133	0.164	0.189
	(0.070)	(0.071)	(0.054)	(0.073)	(0.081)
Investments / Assets	0.180	0.171	0.186	0.178	0.216
	(0.119)	(0.134)	(0.114)	(0.089)	(0.079)
Loans / Assets	0.637	0.657	0.641	0.611	0.541
	(0.129)	(0.141)	(0.117)	(0.102)	(0.09)
Capital (Book) / Assets	0.168	0.192	0.162	0.149	0.077
	(0.079)	(0.069)	(0.057)	(0.109)	(0.027)
Capital (Market) / Assets	0.256	0.29	0.267	0.219	0.112
	(0.084)	(0.076)	(0.07)	(0.07)	(0.043)
Assets, £ ’000	16,925	4,925	10,028	23,577	118,818
	(46951)	(8,098)	(14,097)	(29,721)	(138,944)

Table V

Determinants of becoming a bidder or a target

We run a probit regression with the unit of observation a bank-year. The dependent variable equals 1 if the bank was a bidder (target) in that year and 0 otherwise. ROE, London Bank, Assets, Deposits, Loans, and Counties Present are as defined in Table IV. Tobin's Q is the market value of equity plus the book value of debt divided by Assets. Member Clearing House equals 1 if the bank was a member of the Clearing House, and 0 otherwise. Public Bank equals 1 if the bank was a joint-stock bank and 0 otherwise. We use decadal dummies (1885-1894, 1895-1904 etc.) for columns (1) - (3) and a dummy for the first half of the sample (1885-1904) in columns (4) - (9), these dummies are not reported. LAG indicates the variable was lagged by one year. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Bidder			**Target**					
Banks	Public	Public	Public	Public	Public	Public	All	All	All
Time period	Full	1885-1905	1906-1925	Full	1885-1905	1906-1925	Full	1885-1905	1906-1925
ROE (LAG)	0.387**	-0.060	0.929***	-0.392	-0.500*	-0.027	-0.010	-0.064	0.148
	(0.195)	(0.354)	(0.264)	(0.265)	(0.281)	(0.302)	(0.145)	(0.145)	(0.224)
London Bank	0.042*	0.035	0.003	-0.007	-0.013	0.052	-0.043**	-0.041**	0.009
	(0.026)	(0.025)	(0.024)	(0.015)	(0.015)	(0.036)	(0.018)	(0.019)	(0.027)
Ln (Assets)	0.009	0.015**	0.022*	-0.009**	-0.015***	-0.024***	-0.016***	-0.018***	-0.031***
	(0.007)	(0.006)	(0.013)	(0.004)	(0.004)	(0.007)	(0.004)	(0.004)	(0.008)
Deposits/Assets (LAG)	0.015	0.011	0.070	0.183**	0.077	0.719***	0.111**	0.048	0.563***
	(0.096)	(0.099)	(0.267)	(0.079)	(0.065)	(0.159)	(0.053)	(0.045)	(0.142)
Loans/Assets (LAG)	0.108**	0.068	0.217**	-0.070**	-0.026	-0.094*	-0.009	0.031	-0.072
	(0.053)	(0.047)	(0.105)	(0.030)	(0.031)	(0.053)	(0.028)	(0.027)	(0.049)
Ln (1 + Counties Present)	0.020	0.020*	0.011	-0.006	-0.000	-0.023*	0.007	0.001	0.010
	(0.012)	(0.011)	(0.022)	(0.007)	(0.007)	(0.013)	(0.008)	(0.008)	(0.013)
Tobin's Q (LAG)	0.104	0.013	0.288***	-0.013	-0.007	0.019			
	(0.071)	(0.031)	(0.109)	(0.017)	(0.014)	(0.020)			
Member Clearing House	-0.014	-0.024	0.008	0.003	0.024	-0.024	0.013	0.038*	-0.046
	(0.020)	(0.025)	(0.016)	(0.018)	(0.018)	(0.034)	(0.024)	(0.023)	(0.030)
Public Bank							-0.071***	-0.066***	-0.022
							(0.017)	(0.015)	(0.039)
Chi^2	67.84	28.23	77.25	43.54	33.00	54.81	86.83	69.28	34.74
N	1807	1320	487	1860	1366	494	2148	1590	558

Table VI
Wealth Effects of Mergers and Acquisitions

We calculate the average abnormal returns of bidders and targets in the months surrounding the announcement of a merger. Month 0 is the month in which the announcement took place, -1 the month before, +1 the month after. Standard errors are in parentheses, and are clustered by bank. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level respectively.

Panel A: Bidders

	Average Abnormal Returns				# Obs.
Event Window	**(0)**	**(-1 , 0)**	**(0 , +1)**	**(-1 , +1)**	
Full Sample (1885-1925)	0.74%***	0.90%***	0.75%***	0.92%***	
	(0.19)	(0.24)	(0.23)	(0.26)	173
1885-1905	1.03%***	0.95%***	1.13%***	1.06%***	
	(0.03)	(0.26)	(0.37)	(0.31)	114
1906-1925	0.17%	0.80%*	0.01%	0.63%	
	(0.27)	(0.45)	(0.40)	(0.52)	59
Public Targets (1885-1925)	0.95%***	1.2%***	0.85%***	1.13%***	
	(0.27)	(0.34)	(0.26)	(0.32)	95
Private Targets (1885-1925)	0.47%**	0.50%*	0.62%*	0.64%**	
	(0.23)	(0.25)	(0.35)	(0.30)	78

Panel B: Targets

	Average Abnormal Returns				# Obs.
Event Window	**(0)**	**(-1 , 0)**	**(0 , +1)**	**(-1 , +1)**	
Full Sample (1885-1925)	6.6%***	7.9%***	6.7%***	8.2%***	
	(1.19)	(1.4)	(1.24)	(1.48)	82
1885-1905	3.3%***	4.5%***	4.0%***	5.15%***	
	(0.7)	(1.1)	(0.9)	(1.31)	47
1906-1925	10.9%***	12.5%***	10.9%***	12.4%***	
	(2.4)	(2.7)	(2.5)	(2.83)	35

Panel C: Combined Value

	Average Abnormal Returns				# Obs.
Event Window	**(0)**	**(-1 , 0)**	**(0 , +1)**	**(-1 , +1)**	
Full Sample (1885-1925)	2.1%***	2.5%***	2.0%***	2.4%***	
	(0.38)	(0.43)	(0.36)	(0.41)	82
1885-1905	1.7%***	2.0%***	1.8%***	2.1%***	
	(0.29)	(0.41)	(0.35)	(0.48)	47
1906-1925	2.6%***	3.1%***	2.2%**	2.7%**	
	(0.84)	(1.03)	(0.92)	(1.05)	35

Table VII
Information leakages

In Panel A we present cumulative average abnormal returns for firms involved in a merger in the months leading up to the merger announcement. Standard errors are clustered by bank. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level respectively. In Panel B we show the average number of daily trades (not the volume of shares) of the target bank from 51 weeks to 6 weeks before the merger announcement, from 5 weeks to the week before the announcement, and from the announcement week to 4 weeks after the announcement.

Panel A : CAARs

	Bidders		Targets	
Months relative to the announcement	CAAR	Standard Errors	CAAR	Standard Errors
[-24,-13]	-0.1%	3.0%	-8.4%	5.5%
[-12,-5]	0.4%	0.3%	0.4%	0.7%
[-4,-1]	0.1%	0.3%	1.1%	0.7%
[-4,0]	0.8%***	0.3%	8.4%***	1.5%
-12	0.2%	0.1%	0.0%	0.2%
-11	0.0%	1.0%	0.1%	0.2%
-10	0.0%	1.0%	0.0%	0.2%
-9	-0.1%	1.0%	0.1%	0.3%
-8	0.1%	0.1%	0.4%*	0.2%
-7	-0.1%	0.1%	-0.2%	0.4%
-6	0.3%**	0.1%	0.4%	0.3%
-5	0.0%	0.1%	-0.4%	0.3%
-4	-0.2%	0.2%	0.4%	0.3%
-3	-0.2%	0.2%	0.1%	0.3%
-2	0.2%	0.2%	0.1%	0.4%
-1	0.2%	0.2%	1.2%	0.8%

Panel B : Average Number of Daily Trades (Target)

Target	Date	(-51, -6)	(-5, -1)	(0, +4)
Consolidated Bank	Apr 27, 1896	0.22	1.75	3.20
City Bank	Oct 2, 1898	1.18	5.75	4.20
London & Westminster	Jul 23, 1909	2.85	3.25	3.80
Union of London & Smiths	Dec 14, 1917	1.84	1.75	3.40
Parr's Bank	Feb 1, 1918	1.98	2.00	4.80
London Joint Stock	Feb 18, 1918	3.13	3.00	8.80
London, Provincial & SW	Jul 11, 1918	5.11	5.25	8.60
Capital & Counties	Jul 17, 1918	2.20	2.00	3.20

Table VIII
Cross-sectional Analysis of Deals' Abnormal Returns

The dependent variable is the merged bank's abnormal return in the month of the announcement, where the merged bank (both before and after the announcement) is defined as the bidder plus target. Bank HHI is a bank-specific weighted average of county-level HHIs, where the weights are given by the fraction of that bank's branches in a particular county. Other variables are as defined in Tables IV and VIII. Standard errors appear in parentheses and are clustered by bank. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level respectively.

	(1)	(2)	(3)	(4)	(5)
Constant	0.007	-0.004	0.018	0.021	0.017
	(0.008)	(0.020)	(0.023)	(0.048)	(0.035)
Payment in Shares	0.013	0.007	0.009	0.009	0.007
	(0.008)	(0.011)	(0.009)	(0.010)	(0.009)
London Bank, Bidder		-0.009	-0.007	-0.007	-0.008
		(0.010)	(0.009)	(0.010)	(0.009)
London Bank, Target		0.004	0.002	0.002	-0.001
		(0.009)	(0.008)	(0.009)	(0.009)
Overlap		0.006	-0.023	-0.022	-0.010
		(0.044)	(0.046)	(0.049)	(0.046)
ROE, Bidder		0.312	0.381*	0.381	0.347
		(0.215)	(0.220)	(0.230)	(0.210)
ROE, Target			-0.355**	-0.354**	-0.287*
			(0.155)	(0.161)	(0.154)
Δ Bank HHI		-0.638*	-0.496	-0.496	-0.537
		(0.339)	(0.337)	(0.342)	(0.337)
Ln (#Branches, Target)		0.001	0.003	0.003	0.006
		(0.005)	(0.005)	(0.005)	(0.005)
Ln (#Branches, Bidder)		-0.003	-0.005	-0.004	-0.006
		(0.006)	(0.006)	(0.009)	(0.007)
Target in Distress		0.003			
		(0.011)			
Ln (# Shareholders, Bidder)				-0.000	
				(0.009)	
Ln (# Shareholders, Target)				-0.000	
				(0.005)	
Capital Issued/Shareholders, Bidder					-0.013
					(0.018)
Capital Issued/Shareholders, Target					0.015**
					(0.006)
R^2	0.033	0.227	0.265	0.265	0.314
Observations	80	79	79	79	79

Table IX

Effects of a Merger on Uninvolved Banks

In Panel A we present the average abnormal returns of uninvolved banks (i.e. those not participating in the merger) and the associated standard errors (in parentheses) in the month of a merger announcement. We cluster the standard errors by bank. In Panel B we regress the abnormal return of uninvolved banks in the month of an announcement on various characteristics. Deal Size is the natural logarithm of the sum of the bidder's market capitalization plus the target's market capitalization. Uninvolved Bank's Size is the natural logarithm of the uninvolved bank's market capitalization. Uninvolved bank's probability of being acquired is estimated via a Probit model the year before the merger. Other variables are as defined in Table IV. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level respectively.

Panel A

	All Targets					Public Targets Only				
Sample	Full	1885-1895	1896-1905	1906-1915	1916-1925	Full	1885-1895	1896-1905	1906-1915	1916-1925
Average Abnormal Return	0.14%***	-0.04%	0.26%***	0.08%	1.41%***	0.21%***	-0.01%	0.27%***	0.11%	1.61%***
Standard Errors	0.04%	0.06%	0.05%	0.06%	0.41%	0.04%	0.06%	0.05%	0.08%	0.39%
Observations	9795	4492	3614	1289	400	5169	2118	1937	820	294

Panel B

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Banks Fixed Effects	No	No	No	Yes	Yes	Yes	Yes	Yes
Years Fixed Effects	No	No	Yes	No	No	Yes	No	No
Mergers Fixed Effects	No	No	No	No	No	No	Yes	Yes
Constant	0.001***	-0.019**	-0.007	-0.004	0.001***	-0.008	0.003	0.015
	(0.000)	(0.009)	(0.014)	(0.012)	(0.000)	(0.006)	(0.026)	(0.024)
Δ Bank HHI	0.288***	0.217**	0.188*	0.221**	0.254***	0.223**	0.199*	0.233**
	(0.086)	(0.097)	(0.100)	(0.104)	(0.081)	(0.096)	(0.101)	(0.102)
Public Target		0.001*	0.001			0.001*	0.001	
		(0.000)	(0.000)			(0.000)	(0.000)	
Uninvolved Bank's Loans/Assets		0.006**	0.006**	0.004		-0.002	-0.002	-0.002
		(0.003)	(0.003)	(0.003)		(0.005)	(0.004)	(0.004)
Uninvolved Bank's Capital/Assets		-0.003	0.001	0.002		-0.009	0.005	0.009
		(0.009)	(0.010)	(0.010)		(0.012)	(0.015)	(0.015)
Deal Size		0.001***	0.000			0.001***	0.000	
		(0.000)	(0.001)			(0.000)	(0.001)	
Uninvolved Bank's Size		0.000	0.000	0.000			-0.000	-0.001
		(0.000)	(0.001)	(0.001)			(0.001)	(0.002)
Uninvolved Bank's		0.007	0.012	0.005		0.003	0.019	0.010
probabilty of being acquired		(0.014)	(0.021)	(0.020)		(0.018)	(0.027)	(0.026)
R^2	0.002	0.008	0.025	0.064	0.001	0.006	0.022	0.063
Observations	9198	6346	6346	8038	9198	6346	6346	8038

Table X

Long-Term Buy and Hold Abnormal Returns for Acquiring Banks

We construct portfolios, rebalanced monthly, of banks which had taken over any/a public target in the last 12 or 24 months. We calculate equally-weighted portfolio returns and regress portfolio returns on (i) the market return less the risk-free rate and (ii) the 4 Fama-French factors. The intercept, alpha, shows the portfolio abnormal return. Standard errors are clustered by bank and appear in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level respectively.

	taken over any target in last:				taken over a public target in last:			
	12 months	12 months	24 months	24 months	12 months	12 months	24 months	24 months
Alpha	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)
Market return minus risk free	0.643***	0.454***	0.616***	0.471***	0.650***	0.452***	0.627***	0.453***
	(0.093)	(0.088)	(0.053)	(0.056)	(0.109)	(0.105)	(0.062)	(0.066)
Small minus Big		0.189		0.149		0.142		0.209*
		(0.139)		(0.091)		(0.167)		(0.110)
High minus Low		-0.179		-0.118*		-0.145		-0.164*
		(0.109)		(0.071)		(0.127)		(0.084)
Momentum		0.031		0.053		0.076		0.082
		(0.068)		(0.045)		(0.082)		(0.054)
R^2	0.099	0.103	0.224	0.209	0.084	0.077	0.189	0.170
Observations	433	433	462	462	393	393	444	444

Table XI
Real Effects of Bank Mergers

We measure the effects of increasing bank concentration on two variables of economic interest, the employment to population ratio and the number of people per bank branch, both measured at the county level. We regress the county-level employment to population ratio (using the total population, not working-age population, in that county) on county HHI and various controls lagged by one year in columns (1) and (2). County-level employment are available at decadal frequency and come from Lee (1979). We use county and decadal fixed effects. In columns (3) and (4) we regress a measure of bank service (people per branch), with annual population data interpolated from decadal census data, on lagged county HHI and controls. We use county and year fixed effects. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level respectively.

	Employment / Population		Population / Branches	
	(1)	(2)	(3)	(4)
Constant	0.449***	1.182***	7.875***	-1.891
	(0.010)	(0.351)	(0.677)	(26.129)
County HHI (LAG)	-0.109**	-0.115**	10.976***	6.444***
	(0.047)	(0.050)	(3.678)	(2.194)
County branches (LAG)		0.002		-4.015***
		(0.016)		(0.600)
County population (LAG)		-0.058*		0.837
		(0.030)		(2.021)
R^2	0.659	0.675	0.657	0.793
Observations	172	164	1681	1681

Table XII
Determinants of Bank Risk, Public Banks

We regress public banks' balance sheet ratios on bank characteristics, each observation is a bank-year. Columns (1) - (5) are estimated via OLS with year and bank fixed effects. Columns (6) - (10) are estimated via two-stage least squares (using Bank HHI in 1885 as an instrument) with year fixed effects. Standard errors appear in parentheses and are clustered by bank. The standard deviation of returns is calculated as the standard deviation of the monthly returns of the bank in years t, t+1 and t+2. Bank HHI is as defined in Table VIII, all other variables are as defined in Table IV. Δ Ln(Assets) is Ln(Assets) in year t less Ln(Assets) in year t-1. LAG indicates the variable was lagged by one year. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level respectively.

	Cash/ Assets	Investm./ Assets	Loans/ Assets	Cap(Book) /Assets	Standard Deviation of Returns	Cash/ Assets	Investm./ Assets	Loans/ Assets	Cap(Book) /Assets	Standard Deviation of Returns
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Bank HHI (LAG)	-0.149	0.616***	-0.492*	-0.061	0.048	-0.313**	1.212***	-0.842***	-0.011	-0.032*
	(0.144)	(0.227)	(0.260)	(0.092)	(0.047)	(0.132)	(0.272)	(0.273)	(0.180)	(0.019)
Ln(Assets) (LAG)	-0.006	-0.027**	0.013	-0.015**	-0.007*	-0.004	-0.010	-0.004	-0.007	-0.002*
	(0.016)	(0.012)	(0.015)	(0.007)	(0.004)	(0.008)	(0.012)	(0.016)	(0.011)	(0.001)
ROE (LAG)	-0.102	0.069	-0.016	-0.328***	-0.011	-0.047	0.674*	-0.530	-0.789**	-0.020
	(0.125)	(0.156)	(0.182)	(0.083)	(0.042)	(0.181)	(0.353)	(0.364)	(0.322)	(0.034)
Returns (LAG)	-0.017	-0.045	0.033	-0.005	-0.026***	0.089	0.082	-0.201	-0.152	-0.003
	(0.030)	(0.032)	(0.032)	(0.017)	(0.009)	(0.081)	(0.079)	(0.133)	(0.097)	(0.014)
Member Clearing House						0.022	-0.002	-0.034	0.008	0.008***
						(0.018)	(0.025)	(0.032)	(0.029)	(0.002)
Ln (Counties Present)	0.015*	-0.017	0.028**	0.009	-0.002	0.020**	-0.020	0.016	-0.027**	0.002
	(0.009)	(0.013)	(0.013)	(0.007)	(0.004)	(0.009)	(0.017)	(0.020)	(0.013)	(0.001)
Δ Ln(Assets)	-0.005	-0.007	0.011	-0.000	0.002	-0.005	-0.020	0.019	-0.041**	0.013
	(0.009)	(0.010)	(0.013)	(0.005)	(0.004)	(0.013)	(0.019)	(0.020)	(0.017)	(0.012)
R^2	0.213	0.273	0.278	0.575	0.240	0.183	0.364	0.261	0.493	0.222
Observations	1430	1430	1430	1430	1457	1354	1354	1354	1350	1381

Figure 1

Number of Bank Mergers in the United Kingdom

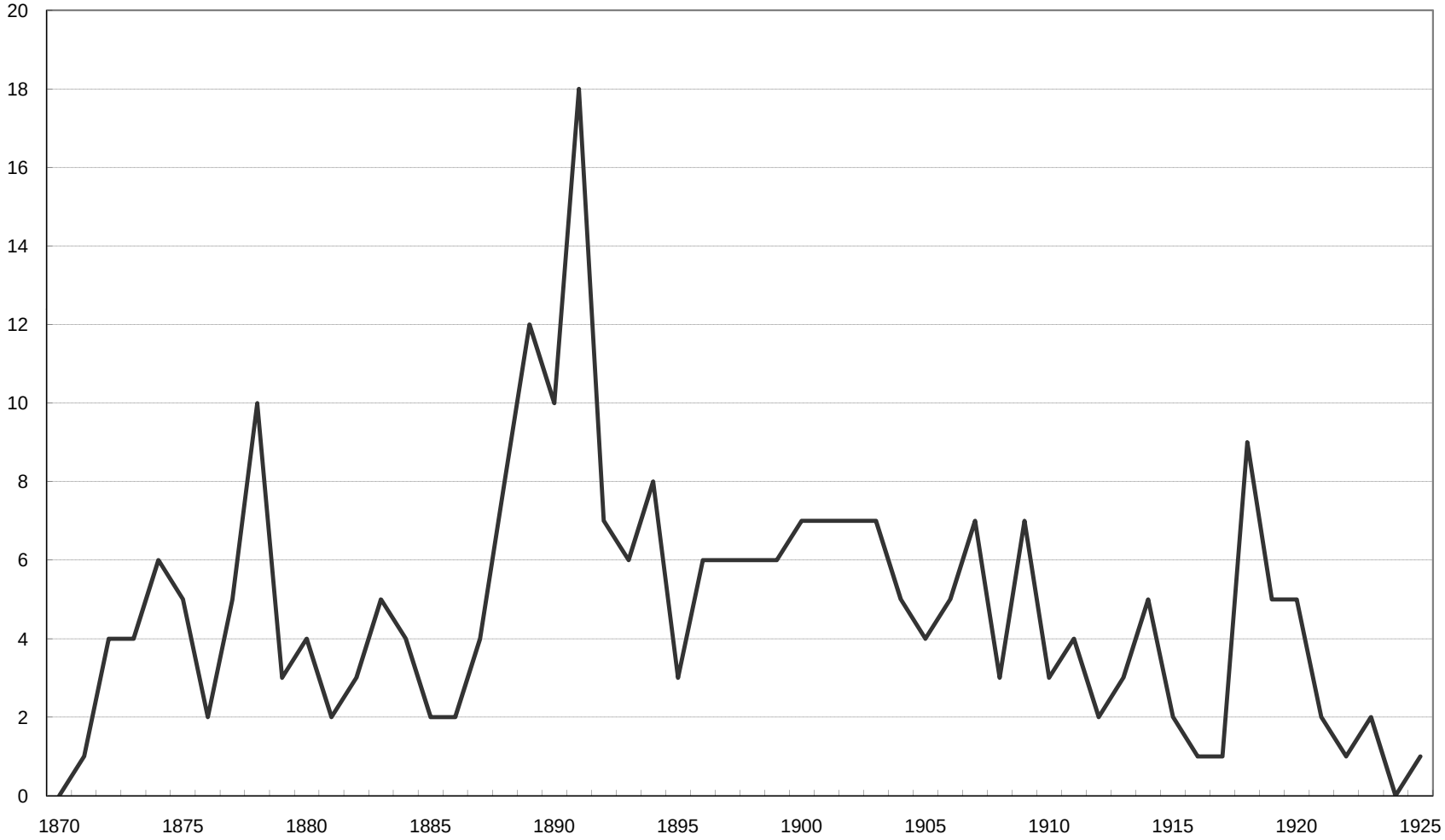

Figure 2
Deposits Herfindahl Index

The deposits Herfindahl index equals the sum of squared market shares of all banks, where each bank's market share equals its deposits divided by aggregate deposits.

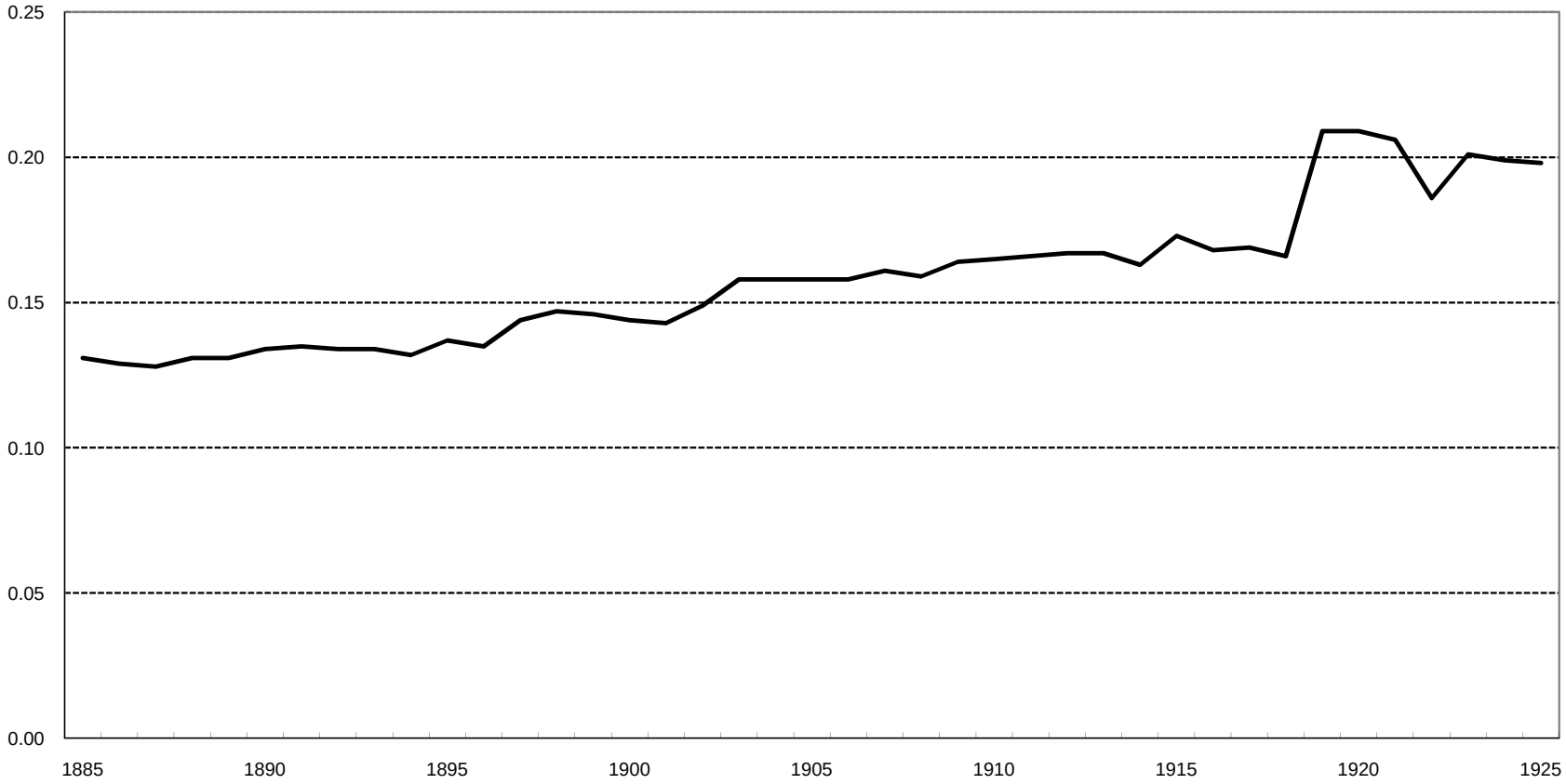

Figure 3
Balance Sheet Ratios - aggregated across all banks

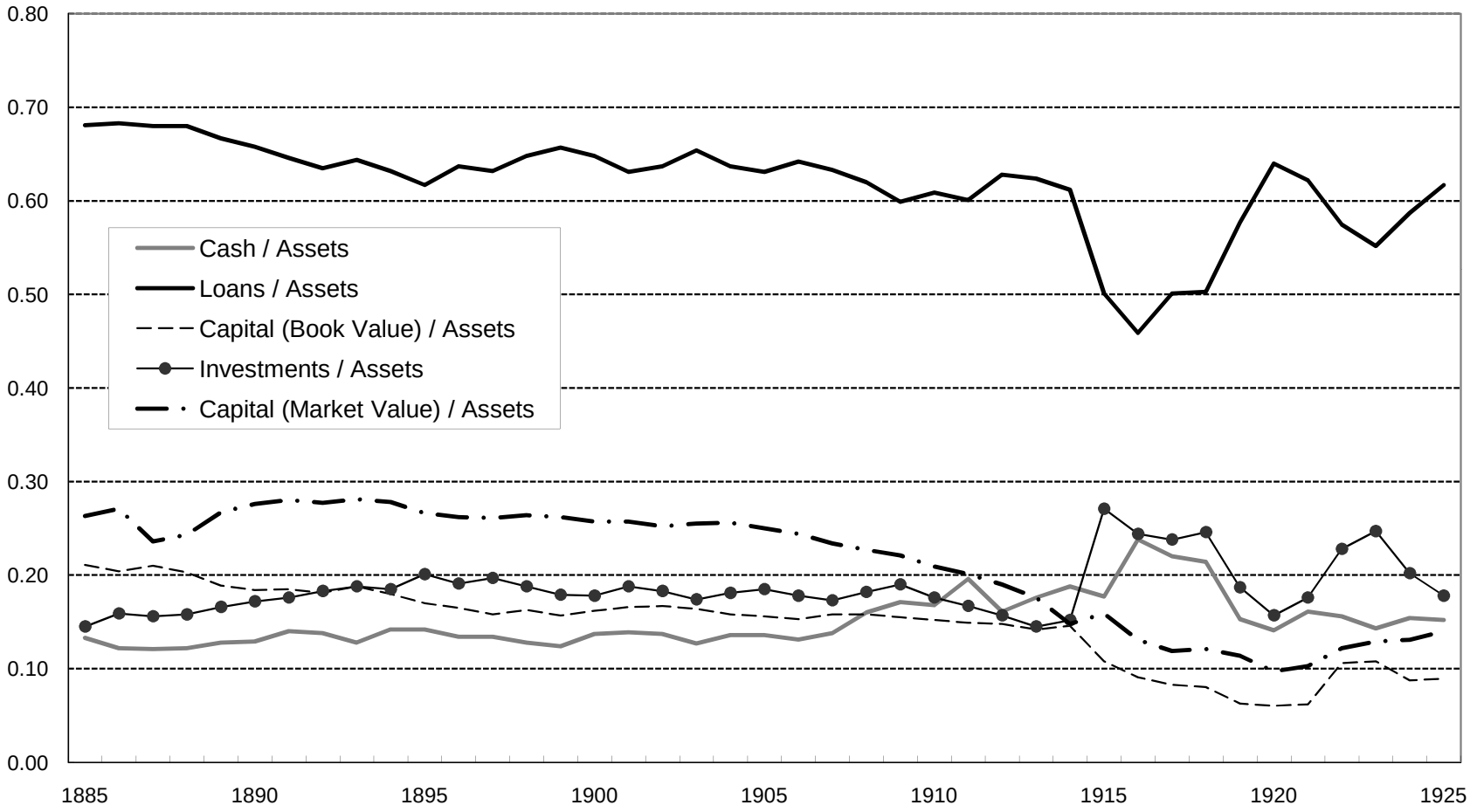

Figure 4 - Value Weighted Accumulation Indices

We calculate monthly returns on ordinary equity for all firms in our sample. We weight these returns by market capitalization and construct an index with January 1885 equal to 100. We calculate indices for all banks and for all non-bank firms separately.