Why did shareholder liability disappear?

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ABSTRACT

Why did shareholder liability disappear? We address this question by looking at its use by British insurance companies until its complete disappearance. We explore three possible explanations for its demise: (1) regulation and government-provided policyholder protection meant that it was no longer required; (2) it had become *de facto* limited; and (3) shareholders saw an opportunity to expunge something they disliked when insurance companies grew in size. Using hand-collected archival data, our findings suggest investors attached a risk premium to companies with shareholder liability, and it was phased out as insurance companies expanded, which meant that they were better able to pool risks.

1. Introduction

In its final edition of the last millennium, *The Economist* claimed that limited liability is the key to industrial capitalism, and has ultimately transformed the world. Limited liability is ubiquitous in modern financial systems, but its potential role in exacerbating risk taking by financial institutions has been recently emphasized by economists (Aldunate et al., 2021). Scholarship on the U.S. banking system both during and before the Great Depression suggests that banks with double liability were less likely to fail (Grossman, 2001; Aldunate et al., 2021). In the light of the global financial crisis of 2008, some scholars have even gone as far as to advocate a return of shareholder liability or a form of increased-liability equity for banks and bankers (Admati and Pfleiderer, 2010; Ridyard, 2013; Hendrickson, 2014; Goodhart and Lastra, 2020). This raises the question of when, and why, did shareholder liability disappear?

In this paper, we address this by looking at the use of shareholder liability by British insurance companies over the long run. The British insurance industry is an important case study because it has a very long and global tradition, stretching back to before 1720 (Raynes, 1964; Supple, 1970; Pearson, 1997; Harris, 2000; Wilkins, 2009; Frehen et al., 2013). Using a hand-collected large dataset, from a range of archival sources, we explore three possible hypotheses as to why shareholder liability disappeared.

The first conjecture we examine is that regulation and government-provided policyholder protection meant that shareholder liability was no longer required. However, there were no regulatory changes during or even immediately after the period when shareholder liability disappeared. We find that nearly all companies expunged their shareholder liability many years before the passage of the Policyholders Protection Act in 1975, which could be regarded as a substitute protection mechanism for customers.

The second conjecture we consider is that shareholder liability was removed because it was largely irrelevant. One plausible reason for this irrelevance is that there may have been nothing to prevent shares being sold to individuals who would have been unable to pay calls on them because insurance company shares were freely transferable (Woodward, 1985; Winton, 1993). In other words, the liability may have been de jure extended, but de facto limited. Thus, expunging shareholder liability was simply acknowledging what was already a reality. We have obtained unique archival data on shareholder wealth for a large insurance company to analyze this hypothesis. Using this data, we find that

shareholders had more than enough wealth to cover potential calls on their shares.

An alternative explanation is that the risks associated with extended liability led to a higher cost of capital. We compare the risk-adjusted returns for insurance companies with and without shareholder liability, using monthly share prices for insurance companies from 1830 until 1929. Portfolio analysis, and also Fama and MacBeth (1973) regressions, show that insurance stocks with shareholder liability had a higher return than those with no liability. Our evidence therefore suggests that it was priced in by investors, although it should be noted that unobserved differences between companies with and without shareholder liability may be driving these findings.

This increased cost of capital incentivized companies to remove uncalled capital, but they may have been reluctant to do so because it would have reduced the confidence of their customers that their policies would be honored. Ordinary equity and reserves provided a cushion against losses, and shareholder liability offered a further buffer which could be used if needed. However, we argue that such a buffer became less important as companies increased in size, which they did through organic growth and mergers. By their nature, insurance payouts can be volatile, depending on the events of a given year. Given the standard principles of diversification, offering a larger number of policies with low correlation between them should reduce the standard deviation of payouts. This should have made it less likely that the additional backup provided by shareholder liability would ever be needed.

To test for the possibility that increased firm size coincided with the demise of shareholder liability, we hand collected financial statement data. Our analysis suggests that size was an important determinant of the level of shareholder liability that insurance companies possessed, and that changes in size were associated with changes in uncalled capital.

We then examine in detail how companies grew, with evidence of substantial organic growth, as well as consolidation within the industry driven by mergers. Most of the initial decline in the nominal value of uncalled capital occurred when companies ceased to exist as independent entities, with numerous mergers taking place. Our analysis also suggests that established companies regarded uncalled capital as being 'sticky' and they were reluctant to explicitly remove it. For them, the uncalled capital to asset ratio fell, despite them keeping the nominal value of uncalled capital steady (the numerator), because assets dramatically increased (the denominator). Eventually these companies also slowly reduced the nominal value of uncalled capital by capitalizing their reserves.

Finally, we explore several possible confounding variables, such as stock market regulations, professionalization of management, corporate governance, and the use of reinsurance, but find that they cannot explain changes in uncalled capital. Our findings are consistent with the explanation that shareholder liability was expunged because insurance companies became safer and less volatile as they grew.

This paper is related to a broader literature on the role of shareholder liability and risk-taking in the banking sector. This literature finds that shareholder liability reduced bank risk taking in the United States and UK (Esty, 1998; Grossman, 2001; Mitchener and Richardson, 2013; Grossman and Imai, 2013; Turner, 2014; Bodenhorn, 2015; Goodspeed, 2017; Koudijs et al., 2021; Aldunate et al., 2021). However, the evidence from other countries does not find this relationship (Grodecka and Kotidis, 2016; Colvin, 2018; Kenny and Ögren, 2021). Furthermore, shareholder liability did not guarantee stability during the Great Depression or times of widespread financial distress (Grossman, 2001; Hickson and Turner, 2002; Anderson et al., 2018). An analysis of its role in the insurance industry has, to the best of our knowledge, been ignored by previous scholars.

Another strand of the literature that our paper directly speaks to is that dealing with the demise of shareholder liability in the financial sector. Vincens (1957) suggests that the experience with attempts to collect assessments during the Great Depression revealed that double

liability in the U.S. provided little in the way of protection for depositors. This claim is challenged by Macey and Miller (1992). Wilson and Kane (1996) argue that the U.S. banking panics of the early 1930s changed the calculus for large shareholders of banks, with the result that they lobbied for and obtained federal deposit insurance as a replacement for double liability. Our paper contributes to this literature by looking at insurance and a country apart from the United States. We find that industry growth and consolidation, rather than regulation or potential problems with assessments, meant that shareholder liability was no longer required.

Shareholder liability played a special role in the insurance industry because it gave policyholders more confidence that their claims would be honored. There were strong parallels with banking, where it provided assurances to depositors that they could get their savings back. Thus, in financial services, shareholder liability played an important role in attracting customers. In other industrial sectors, however, shareholder liability likely played a different role. In the early railways, shares were often issued with large amounts of uncalled capital, which was then paid up in instalments as construction of the lines took place. In other sectors it was a reserve of capital which may have provided additional assurances to bondholders and other creditors. Thus, its disappearance in non-financial sectors may have occurred for different reasons, with the result that our findings do not necessarily translate to explain the disappearance of shareholder liability in other industries.

2. Context and concepts

Until the Companies Act of 1862, the only way for an insurance company in the UK to have limited liability was to have been incorporated via a Royal Charter or an Act of Parliament. Two famous examples of companies incorporated by an Act of Parliament are the London Assurance and Royal Exchange Assurance, which were a late addition to the Bubble Act of 1720. Because companies with tradeable shares were illegal under the Bubble Act, other insurance businesses were formed as unincorporated companies, which were clever legal workarounds utilizing trust law (Turner, 2018). These insurance companies contracted in their deeds of settlement (i.e., corporate constitutions) to create limited liability (Supple, 1970, p.118). The UK's Courts of Chancery upheld the limited liability clauses in these deeds of settlement (Hunt, 1936, p. 100; Cooke, 1951, pp. 167–8). However, under the common law, unincorporated companies were *de jure* and *de facto* unlimited (Macgillivray and Browne, 1937, p.3). The implications of this for insurance companies was that shareholders could limit their liability inter se, but not to third parties such as policyholders (Harris, 2000, p.143). Even investors recognised this state of affairs (Raynes 1948, p.211).

With the passage of the 1862 Companies Act, insurance companies could remove legal uncertainty around their liability by simply registering under this legislation, which most of them did. Some of the established companies continued to operate under unlimited liability, but then converted later. Almost all new insurance companies registered as formally having limited liability, but with extended liability, i.e., uncalled capital which could be called upon by directors at any time, or by policyholders and other creditors in the event of bankruptcy.

Why would insurance companies have shareholder liability? According to Lekkerkerker and Peters (1995), shareholder capital in the insurance industry acts as a buffer, which is available to pay for excess claims arising from disasters. This capital can be held by the insurance company and invested in low-risk assets, but this entails a high opportunity cost. An alternative is for shareholders to have a liability which is not limited, and which can be called up when claims exceed premiums. This type of capital can be used more productively by the shareholders than the insurance company.

As well as acting as a buffer, shareholder liability may act to constrain risk shifting. Risk shifting is a problem in banking because loan portfolios are opaque, so that depositors, at any given time, do not know the true value of a bank's assets (Bhattacharya et al., 1998). Shareholder liability can play a very important role in constraining bank managers

from risk shifting at the expense of depositors because shareholders monitor and constrain managerial behavior. Furthermore, managers are incentivized to act prudently because they also stand to lose personal wealth as owners. Similarly, in insurance firms, managers may take on too much risk unobserved by policyholders. For example, they can invest in overly risky assets which are not traded on public markets so that policyholders cannot easily assess the value of the insurance company's portfolio. This risk could result in large claims in the future which exceed the ability of the insurance company to meet them from its own resources. Shareholder liability can check this risk-shifting behaviour because shareholders monitor managers, and managers have skin in the game as owners themselves. The presence of shareholder liability means that policyholders do not need to engage in very costly monitoring of insurance companies. They simply need to know that shareholder liability is present and credible.

The extant literature does not provide us with a good understanding of when shareholder liability disappeared in the UK insurance industry, nor the extent to which it was used prior to its disappearance. To address this gap in our knowledge, we collected data on uncalled capital for all British and Irish non-subsidiary insurance companies contained within the insurance section of the *Stock Exchange Yearbook*. Further details on this source are available in the Appendix.

From Table 1, we can see that there was a major decrease in the proportion of companies with shareholder liability. In 1880, 97 % of companies had it, but by 1930 this had fallen to 74 %, and then declined to just 15 % in 1965. According to later *Stock Exchange Yearbooks*, there was only one firm with shareholder liability in 1974. This remaining company was acquired by another firm that year, with the result that there were no companies with shareholder liability in 1975.

Table 1 also shows that the ratio of uncalled capital to the paid-up capital already provided by shareholders declined substantially. In 1880, there was over quintuple liability, meaning that for every £1 of equity that had been invested, the shareholders were liable for an additional £5.67. By 1930, this had fallen to close to double liability, with every £1 paid-up implying an additional amount of £1.39 could be called up, and by 1965 the ratio was close to zero.

Using balance sheet data, we analyze the ratio of uncalled capital to assets, and identify whether changes originated from shifts in the numerator or denominator. Table 1 illustrates that in absolute terms the decline in uncalled capital was quite gradual. In contrast, assets grew rapidly. The effect of this was that the uncalled capital to assets ratio fell from 56.7 % in 1880, to 33.3 % in 1900, 4.4 % in 1930, and essentially 0.0 % in 1965. The paid-up and reserves to assets ratio also fell, but much more modestly. These results illustrate that there was a slow decline in the uncalled capital to assets ratio due to changes in the numerator, but much more dramatic and rapid declines due to changes in the denominator.

3. Regulation and government safety nets

Shareholder liability provided policyholders with a large degree of assurance that their claims would be met even if the insurance company was to fail. It also provided them with confidence that the managers of the insurance company would not take excessive risk which would jeopardize their ability to pay out on policies.

A possible explanation as to why shareholder liability disappeared is that the government introduced regulation which acted as a substitute, or undermined it. However, analysis shows that state intervention was minimal. The genesis of insurance regulation in the UK was the Life Assurance Companies Act of 1870. Its focus was on 'freedom with publicity', which would be the philosophy of insurance regulation in the UK for the next century. This legislation required firms to publish their accounts, and to have their financial condition reviewed by an actuary every five years, which made it more difficult for life assurance companies to give a false impression of the security of their business. It also required companies to lodge a deposit of £20,000 with the Accountant-

General, placed limits on amalgamations so that they would not be approved if more than 10 % of policyholders objected, and discussed some processes around winding up a firm. The 1870 Act was extended to all general insurance companies by the Assurance Companies Act of 1909, with generally similar provisions.

There is nothing in these Acts which discouraged insurance companies from using uncalled capital. In the 1870 Act the only mention of it is to confirm that if a company was being wound up, the 'Court shall suspend further proceedings … to enable the uncalled capital, or a sufficient part thereof, to be called up (section 21)'. This, therefore, ensured the enforcement of uncalled capital, and its central importance. The 1909 Act stated that if the company was commenting on its size in a notice or advertisement, it should report how much paid-up and uncalled capital there was.

The next major piece of legislation which directly affected insurance companies was the Assurance Companies Act of 1946,[1] by which time uncalled capital had already substantially declined in importance. This Act, as well as extending the 1909 Act to the small number of insurance companies that sat outside its ambit, introduced a minimum capital requirement of £50,000 for all new insurance companies and a minimum solvency margin. None of these changes would have directly affected most incumbent insurance companies in terms of the amount of shareholder liability they possessed.

Other legislation happened well after the majority of companies had expunged their shareholder liability. The Companies Act of 1967 increased the minimum capital requirement for new companies and introduced a sliding scale for determining solvency margins so that insurance companies could be wound up while they still had funds to distribute. The Insurance Companies (Amendment) Act of 1973 ended the 'freedom with publicity' philosophy by giving the government surveillance and informal supervisory powers over insurance companies.[2]

The first legislation which provided explicit guarantees to customers was the Policyholders Protection Act passed in 1975. This Act required insurance companies to pay levies to fund a government guarantee, which would pay 90 % of the value of a policy should a company be liquidated and unable to pay out on an insurance policy. Uncalled capital had already declined dramatically several decades prior to this, and there is no suggestion that the Act had been anticipated in advance, as it was only telegraphed by the government in 1974. Notably, the demise of shareholder liability is not mentioned in the various parliamentary debates surrounding its introduction. Indeed, it had been the failure of an insurance company in 1974 which precipitated the introduction of the Policyholders Protection Act (Hodgin, 1986).

The disappearance of shareholder liability occurred many years before the introduction of a supervisory regime in 1973, or of a policyholder safety net in 1975. It does raise the question as to whether the expunging of shareholder liability eventually resulted in the government having to do these things. Notably, there were some muted calls in 1973, in the light of insurance company failures, for shareholder liability to be reintroduced into insurance (*Financial Times*, 6 Feb. 1973, p.2). However, the Insurance Companies Act of 1981 stated that the Department of Trade and Industry would not authorize any new insurance company unless its issued share capital was fully paid. Shareholder liability had not demised because of government intervention, but legislative fiat ensured that it stayed dead and did not rear its head again.

4. Was shareholder liability de facto limited?

It could be argued that shareholder liability was already de facto limited, if the requirement to pay up uncalled capital, when needed, was not enforced. However, the courts ensured that shareholders were

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[1] The Insurance Companies Act, 1958 simply consolidated the 1946 and 1909 Acts into one piece of legislation.

[2] House of Commons Debate, 18 July 1975, vol 895 cc1941-2020.

Table 1
Uncalled capital of british insurance companies, 1880 – 1965 (in constant 1900 prices).

Year	Companies	Companies With Balance Sheet Data	Uncalled Capital (£m)	Paid-up (£m)	Paid-up + Reserves (£m)	Uncalled + Paid-up + Reserves (£m)	Assets (£m)	% of companies with Uncalled	Uncalled / Paid-up	Uncalled / Assets	(Paid-up + Reserves) / Assets	(Uncalled + Paid-up + Reserves) / Assets
1880	125	91	58.5	10.3	19.1	77.6	103.1	96.7 %	5.67	56.7 %	18.5 %	75.2 %
1900	163	139	79.5	16.8	42.5	121.9	238.7	93.5 %	4.73	33.3 %	17.8 %	51.1 %
1911	171	126	58.8	15.7	35.9	94.7	353.8	92.9 %	3.75	16.6 %	10.2 %	26.8 %
1923	125	93	26.8	13.4	32.9	59.7	336.8	82.8 %	2.00	8.0 %	9.8 %	17.7 %
1930	96	78	25.1	18.1	57.5	82.6	573.1	74.4 %	1.39	4.4 %	10.0 %	14.4 %
1965	63	60	0.4	31.3	99.7	100.1	1238.0	15.0 %	0.01	0.0 %	8.1 %	8.1 %

Notes: The sums of uncalled capital, paid-up capital, reserves, and assets, for all British and Irish non-subsidiary insurance companies for which all of this data is available for a particular year are shown. A small number of observations with large deviations in the paid-up capital reported between the *Stock Exchange Yearbook* and financial accounts (likely due to recent share issues or restructuring) are excluded, but robustness checks suggest the results remain very similar. All values are deflated using the Retail Price Index to constant 1900 prices (MeasuringWorth, 2023). The ratios between uncalled capital, paid-up capital, reserves and assets using these industry sums are calculated. Further information on sources and details of the variables are shown in Appendix Table 1.

required to pay the calls for which they were liable. The most notable example, and one which was very clear to the public, was the aftermath of the City of Glasgow Bank failure in 1878. When this major unlimited liability bank collapsed, the shareholders were rigorously pursued with calls on capital. This ensured that depositors received all of their money back, but most shareholders were bankrupted (Acheson and Turner, 2008). Although this was from the banking sector, there was no reason to suspect that extended liability would be less enthusiastically enforced for insurance firms.

Notably, in 1922 *The Times* commented on the calling up of capital by the National Benefit Assurance Company that 'this incident should serve to remind all shareholders, and prospective shareholders, that the existence of uncalled capital really means something … the possibility of such an occurrence should have been in their minds from the moment they contemplated investing in shares of this kind … it is perfectly proper for [the directors] to call on the shareholders to provide the sums for which, from the time of their acquiring the shares, they had made themselves responsible'.[3]

Another possibility, which could lead to companies being de facto limited, would be if investors who held the shares had low wealth and would have been unable to meet any calls. However, there were several factors which prevented this. First, directors of companies with shareholder liability had incentives to vet shareholders to ensure that they had sufficient wealth to cover potential capital calls (Hickson and Turner, 2003). Second, under the common law, and under the 1862 Companies Act, shareholders were liable for any liability for one year after selling their shares. This post-sale-extended liability requirement prevented shares being offloaded in times of financial distress.

One way to address this is to assess the wealth of shareholders, to evaluate whether they could cover potential calls. We have been able to find archival records of the North British Mercantile Insurance Company (NBMIC) to help us do this. The NBMIC was a large composite insurance company, and it was ranked the 5th largest insurance company, and the 65th largest company in the UK, by market capitalization in 1913. It had a similar number of shareholders in 1911 (c.5,000) to the average non-railway company in the top 300 largest companies (c.6,300) (Foreman-Peck and Hannah, 2012). From 1882 until the 1920s, the nominal value of NBMIC's shares was £25 and their paid-up value also remained constant at £6.25, meaning that its shareholders faced quadruple liability on the par value. Their shares generally traded at a large premium, and the additional liability compared to the market price averaged about 50 per cent.

How representative is this company? We think that, if anything, the NBMIC would have been, on the face of it, much more likely to become

de facto limited than its peers. It was a large and frequently traded low-denomination stock, which was actively traded on the London, Edinburgh, Glasgow and Liverpool stock exchanges.

The *Share Transfer Books* of the NBMIC in Aviva's archives contain a substantial amount of detail, including the seller's name and address and whether executors of wills were selling shares. The earliest surviving *Share Transfer Books* date from 1 November 1882. Aviva operates a 100-year policy to protect personal information, which meant that we were given access to these books through to 1920. Digitisation of the transfer books created a database of 33,850 individual transfers. We then utilise the fact that executors of wills were selling shares and went to the NBMIC's *Register of Shareholders* to obtain the shareholding of, and further details about, the deceased shareholders. Using this information, we searched for the deceased shareholder's probate record on Ancestry. com to obtain the value of their probated estate. Probate estate values in this era underestimate wealth because before 1926 all settled land and property was excluded from estate values, and before 1898 all land and property was excluded.[4] In addition, there were ways of hiding wealth (Cummins, 2022). The decedents for which we find the value of their estate may not be completely representative of the NBMIC shareholder constituency for at least two reasons. First, the life-cycle hypothesis may mean that older people have less wealth than some other shareholders because of negative saving (King and Dicks-Mireaux, 1982; Modigliani, 1986). Second, older people typically have higher risk aversion, which makes them less likely to hold stocks in the first place (Morin and Suarez, 1983).

Using this approach, we found the wealth of 562 deceased shareholders. Table 2 reports the probated wealth of these shareholders as well as the proportion of their wealth invested in NBMIC shares at time of death. The wealth of the median shareholder was £15,849, which is equivalent to circa £2 m in 2022. The average and median wealth of deceased shareholders falls across the semi-decades, which is consistent with share investment in this era becoming more widespread among the middle classes (Acheson et al., 2021).

The value of NBMIC shares, as a proportion of probated wealth, was just about 4.9 % for the median shareholder. Their uncalled liability, at a rate of £18.75 per share, was equivalent to just 2.3 % of wealth of the median shareholder, suggesting that they had more than adequate means to pay the maximum call, if it was ever needed. Over the semi-decades, there is little change in the proportion of shareholder wealth invested in NBMIC shares, which means that although shareholders may have been somewhat less wealthy, they had a similar capacity to meet

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[3] *The Times*, May 30, 1922, p. 20

[4] Settled land and property could be seized in the event of bankruptcy. The ability to do so was made much easier with the passage of the Settled Land Act (1882).

Table 2
Wealth of deceased NBMIC shareholders.

	Median	25th %ile	75th %ile	Average	Min	Max
Panel A: Probated wealth of deceased NBMIC shareholders (£)						
1884–1889	39,054	9,873	90,601	173,510	937	3,544,978
1890–1894	17,125	7,237	62,657	91,784	813	1,447,208
1895–1899	17,956	7,435	48,988	56,322	440	852,015
1900–1904	16,338	6,297	61,702	51,814	105	1,012,171
1905–1909	18,969	4,250	65,268	56,906	150	525,811
1910–1914	10,993	4,199	31,452	80,011	92	2,079,611
1915–1920	13,160	3,617	27,606	44,409	506	1,000,000
1884–1920	15,849	5,116	49,944	70,924	92	3,544,978
Panel B: Market Value of NBMIC shares as % of wealth (at time of death)						
1884–1889	4.6 %	2.0 %	10.8 %	9.1 %	0.3 %	80.2 %
1890–1894	7.8 %	2.7 %	17.4 %	14.7 %	0.3 %	96.1 %
1895–1899	5.4 %	2.9 %	12.5 %	13.0 %	0.1 %	99.4 %
1900–1904	4.8 %	1.8 %	11.2 %	11.5 %	0.2 %	78.4 %
1905–1909	5.0 %	2.0 %	12.3 %	9.8 %	0.0 %	60.8 %
1910–1914	4.5 %	1.8 %	8.7 %	7.8 %	0.1 %	91.3 %
1915–1920	3.9 %	1.6 %	12.3 %	11.2 %	0.0 %	86.2 %
1884–1920	4.9 %	1.9 %	12.1 %	10.9 %	0.0 %	99.4 %
Panel C: Uncalled Liability of NBMIC shares as % of wealth (at time of death)						
1884–1889	2.1 %	1.1 %	5.3 %	4.8 %	0.1 %	40.0 %
1890–1894	3.4 %	1.1 %	7.8 %	6.3 %	0.1 %	34.4 %
1895–1899	2.6 %	1.4 %	5.7 %	6.0 %	0.1 %	45.4 %
1900–1904	2.5 %	0.9 %	5.8 %	5.8 %	0.1 %	40.0 %
1905–1909	2.4 %	0.9 %	6.0 %	4.7 %	0.0 %	29.7 %
1910–1914	2.2 %	0.8 %	4.2 %	3.7 %	0.1 %	40.8 %
1915–1920	1.9 %	0.8 %	5.5 %	5.6 %	0.0 %	50.4 %
1884–1920	2.3 %	0.9 %	5.7 %	5.2 %	0.0 %	50.4 %

Notes: Using the North British and Mercantile Insurance Company's (NBMIC) records, we found the names and addresses of deceased shareholders. Using Ancestry.com, we found the probated wealth of 562 deceased shareholders. Panel A reports the descriptive statistics for the probated wealth of the 562 deceased shareholders. Panel B reports the descriptive statistics for the ratio of the market value of NBMIC shares at time of death to the value of the probated estate. Panel C reports the uncalled liability, calculated as £18.75 times the number of shares, as a proportion of probated wealth.

calls.

Assuming that deceased shareholders had the same wealth profiles as living shareholders and that the NBMIC is representative, then our evidence suggests that shareholders were wealthy and had more than enough wealth to cover calls if their company suffered huge losses. This finding is consistent with the view that shareholder liability was not de facto limited and that there were restrictions operating which prevented an equilibrium of low-wealth shareholders emerging (Woodward, 1985; Winton, 1993).

A final possibility, which could have led to de facto limitation, would be if the shares were predominantly held by institutional investors that had limited liability. However, during this era shareholdings were still dominated by retail investors. Investment trusts, closed-end exchanged traded funds, had originated in 1868, and grew in size during this period, but did not invest more than two per cent of their total portfolios in UK bank and insurance companies (Sotiropoulos et al., 2023). An analysis of the shareholder registers for the North British and Mercantile Insurance Company shows that investment companies only owned about 0.38 % of its shares in 1921.

Unit trusts are also unlikely to have had a substantial impact on the security of uncalled capital in the UK insurance industry. The first unit trust is said to have been established in the UK in April 1931, managed by Municipal and General Securities Company.[5] Of the unit trusts listed in the *Financial Times* in 1936/7, only three, by name, explicitly focused on investing in insurance companies. They moved the risk attached with shareholder liability away from the individual investor, so that it would be absorbed by the trust.[6] However, most investment funds were well diversified, which meant that even if one, or even multiple, of their investments in insurance companies called up capital this would not have made them insolvent, so the calls would still have been paid.

5. Risk and the cost of capital

The above evidence suggests that shareholder liability was credible. Thus, if investors viewed shares with shareholder liability as being riskier than fully limited shares, we should expect them to have demanded a risk premium, resulting in a higher cost of capital for shares with shareholder liability.

Qualitative evidence suggests that as time progressed there was a growing consensus that insurance shares with shareholder liability were unpopular with investors. For example, shareholder liability was described by the *Financial Times* in 1918 as a 'handicap' which put off many investors and limited the potential pool of investors to the wealthy.[7] The *Financial Times* again highlighted in 1935 that shareholder liability made insurance shares unattractive.[8]

With regards the possibility of having to pay up uncalled capital, *The Times* noted that 'in return for assuming such liability, shareholders may fairly look for some return, either in the shape of increased dividend or larger capital appreciation, than may be secured in the case of shares carrying no such liability'.[9] To analyze whether shareholders did benefit, ex-post, we analyze the total returns on insurance shares with and without shareholder liability, incorporating the effect of both capital gains and dividends.

We use monthly stock price data from January 1830 to December 1929 from the *Course of the Exchange* and the *Investor's Monthly Manual* (See Appendix, and Appendix Table 1, for further details). We carry out an analysis that splits the insurance companies into two portfolios,

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[5] Although some investment trusts similar to unit trusts were set up in the late 1860s, they acquired limited liability status by the 1880s (Sotiropoulos et al., 2022). The *Financial Times* suggests that no further trusts of this kind were formed in the UK from 1872 until 1931 (*Financial Times Golden Jubilee Supplement*, 'Unit Trusts and the Modern Investor' 14 Feb 1938, p. 37).

[6] *Financial Times*, 20 June 1938, Special Insurance Review, p. II.

[7] *Financial Times*, 5 April 1918, p. 11.

[8] *Financial Times*, 17 June 1935, p. 12.
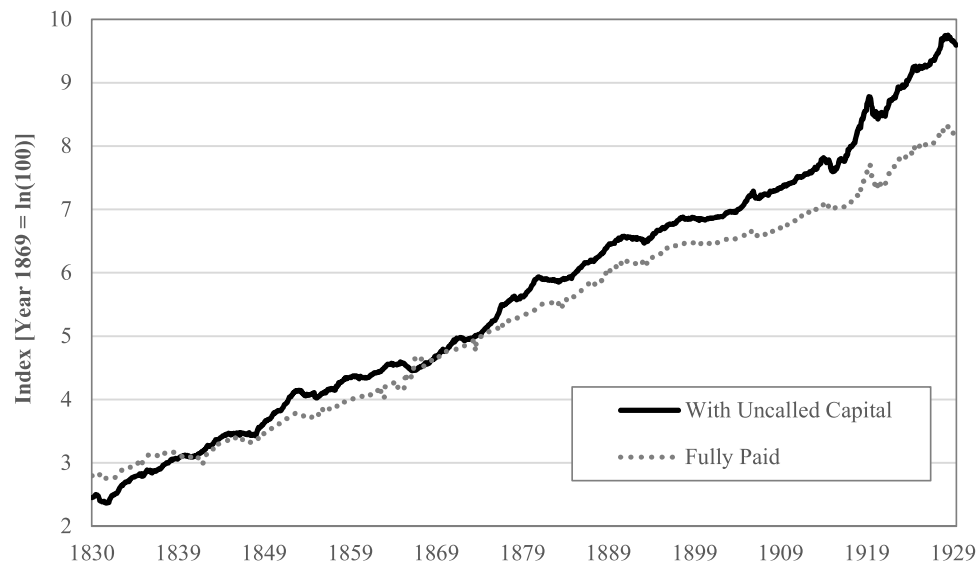
[9] *The Times*, May 30, 1922, p. 20

Fig. 1. Index of returns on insurance companies with and without uncalled capital, 1830 to 1929. Notes: This figure shows a log index [1869 = ln(100)] of average monthly total stock returns (weighted by market capitalization) for insurance companies with and without shareholder liability from 1830 to 1929. The data underlying these indices were obtained from the *Course of the Exchange* (1830 to 1868) and *Investor's Monthly Manual* (1869 to 1929).

rebalanced each December for the following year. One portfolio contains stocks with shareholder liability and the other contains stocks that had no shareholder liability.

As can be seen from Fig. 1, which shows the total returns on the market capitalization weighted indices, stocks with shareholder liability earned higher returns than those that did not. The gap becomes more pronounced over time, particularly during the latter few decades. The average annual return from 1900 to 1929 was 9.6 % for stocks with uncalled capital, compared to just 5.7 % for stocks which were fully paid. This implies an additional cost of capital of 3.8 % associated with extended shareholder liability firms.

Table 3 reports average monthly returns by sub-period, and tests for significant difference between the portfolio with uncalled capital stocks, compared to the portfolio with fully paid stocks. It considers both market capitalization weighted, and equally weighted, portfolios. These returns are then adjusted for risk by calculating the excess return of the portfolio over its expected return based on the portfolio's beta.

For the earlier periods, when shareholder liability was the norm, there is a suggestion that returns for the uncalled portfolio were slightly higher, but not significantly so. However, in the latter period, around the time when uncalled capital begins to become less important, the gap is highly significant. This is regardless of whether the returns were weighted by market capitalization or equally weighted, and whether they were raw or adjusted for beta.

In Appendix Table 2, we use Fama-French time series regressions to analyze a strategy which goes long on the portfolio of stocks with uncalled capital, and short on those which are fully paid. The constant reveals the alpha, showing the excess returns associated with shareholder liability. Consistent with the previous results, there is not a significant difference in the earlier periods, but there is in the latter period from 1900 to 1929. This occurs both when considering the portfolio on its own, and when controlling for the returns on the market index minus the risk-free rate, and portfolios of small minus big (SMB) stocks, and high minus low dividend yield (HML) stocks.

The previous analysis has focused on portfolios, so for robustness in Table 4 we move on to examine the return of individual stocks in Fama-MacBeth regressions. For each month between January 1830 and December 1929, the following cross-sectional regression is run:

$$R_{i,ym} = \alpha_0 + \alpha_1 \, c_{i, \, y-1} + \alpha_2 x_{i, \, y-1} + \ldots + \varepsilon_{i, \, ym} \qquad (1)$$

where R_i represents the monthly return for stock i at month m in year y;

$c_{i,y-1}$ is the measure of shareholder liability for stock i in year y-1; and x_{y-1} are control variables for stock characteristics (size, beta, value, liquidity) for stock i in year y-1. As with the portfolio analysis, factors are determined in December to set up the regressions for each month in the following year. The coefficients from the monthly regressions are then averaged over time using the Fama-MacBeth methodology.

In Table 4, we control for two measures of size, namely the log of market capitalization, and the log of the paid-up value of equity. The results of this analysis suggest that during the latter period, from 1900 to 1929, uncalled capital had a highly significant positive relationship with returns, suggesting that there was a higher cost of capital. During the period from 1870 to 1899, there was also a positive relationship, but the coefficient was smaller and at a lower significance level. For the earliest period, from 1830 to 1869, there was a positive univariate relationship, but this disappears when controlling for other variables. This suggests that the additional cost of capital associated with uncalled capital increased over time.

In Appendix Table 3, we use estimates of Total Assets as alternative measures of size. This has a number of limitations, as the first observations of Total Assets available are only in 1880. We also only have asset data available for a number of snapshot years (1880, 1900, 1911, 1923, 1930 and 1965), so we cannot sort stocks each year using the value of their reported assets. We deal with this in several ways. We begin by running the analysis using the log of Total Assets of the company at the beginning of each historic sub-period. We also run a separate analysis using the log of interpolated Total Assets, assuming linear growth each year between any two snapshots. The results suggest that from 1901 to 1929, consistent with the main results, uncalled capital had a significant positive relationship with returns, implying that there was a higher cost of capital. For the period from 1881 to 1900, the results show that uncalled capital was not significant, again suggesting that the additional cost of capital associated with extended liability increased with time.

Overall, the results from the Fama-MacBeth regressions suggest that, as time progressed, insurance company stocks with shareholder liability began to earn higher returns than insurance company stocks with no liability, reflecting the additional risk to investors of extended liability. From a company's perspective, this implied a higher cost of capital, which may help to explain why it was phased out. However, it should be acknowledged that firms with shareholder liability may well have been different to firms without extended liability on other important dimensions that are unaccounted for by our Fama-MacBeth regressions. It

Table 3
Average monthly performance of shareholder liability sorted portfolios, 1830 to 1929.

Time Period	1830 to 1869		1870 to 1899		1900 to 1929	
	With Uncalled Capital	Fully Paid	With Uncalled Capital	Fully Paid	With Uncalled Capital	Fully Paid
Averages						
Uncalled Capital	84.6 %	0.0 %	81.3 %	0.0 %	77.9 %	0.0 %
Market Cap of Stocks (£m)	0.36	0.73	0.52	1.10	2.02	2.34
Div Yield (%)	3.79 %	4.23 %	4.56 %	4.44 %	4.45 %	4.29 %
Number of Stocks	27.5	4.8	82.5	9.6	53.8	11.9
Market Cap Weighted Returns						
Average Monthly Returns	0.49 %	0.33 %	0.60 %	0.51 %	0.81 %	0.52 %
Standard Deviation	1.25 %	2.11 %	1.25 %	1.36 %	2.43 %	2.02 %
t value, Monthly Returns Uncalled = Fully Paid	1.44		1.12		3.42***	
Average Risk Adj. Monthly Returns	0.14 %	0.00 %	0.24 %	0.22 %	0.39 %	0.11 %
Standard Deviation	1.19 %	2.12 %	1.04 %	1.31 %	2.15 %	1.84 %
t value, Monthly Returns Uncalled = Fully Paid	1.31		0.28		3.37***	
Equally Weighted Returns						
Average Monthly Returns	0.60 %	0.45 %	0.69 %	0.51 %	0.87 %	0.44 %
Standard Deviation	1.19 %	1.76 %	1.26 %	1.31 %	2.18 %	2.04 %
t value, Monthly Returns Uncalled = Fully Paid	1.64		2.09**		4.76***	
Average Risk Adj. Monthly Returns	0.23 %	0.13 %	0.37 %	0.24 %	0.48 %	0.07 %
Standard Deviation	1.29 %	1.78 %	1.15 %	1.30 %	1.99 %	1.95 %
t value, Monthly Returns Uncalled = Fully Paid	1.12		1.54		4.56***	

Notes: This table presents the results and summary statistics of a portfolio analysis carried out on insurance company stocks with and without shareholder liability. Using monthly stock price data from January 1830 to December 1929, we sort the insurance companies into two portfolios, rebalanced each December for the following year. One portfolio contains stocks with shareholder liability and the other contains stocks that have no shareholder liability. Monthly equally weighted and market-capitalization weighted total stock returns are then calculated for each portfolio, with the averages of these presented in the table. These returns are then adjusted for risk by calculating the excess return of the portfolio over its expected return based on the portfolio's beta. Finally, a *t*-test is carried out on the average monthly total stock returns (non-risk-adjusted and risk-adjusted), to determine if the average monthly total stock returns of firms with shareholder liability was significantly greater than those without shareholder liability. The portfolio analysis is carried out across three sub-periods, from 1830 to 1869, from 1870 to 1899, and from 1900 to 1929. Returns have been winsorized at the 1% and 99% levels to ensure the results are not driven by outliers. We exclude stocks for a particular year which changed within that year from liability to no liability, or vice versa, to ensure portfolios do not contain a mix of liability structures. Monthly stock price data from 1830 to 1868 was obtained from the *Course of the Exchange*, and monthly stock price data from 1869 to 1929 was obtained from the *Investor's Monthly Manual*. ***, **, and * indicate significance at the 1 %, 5 %, and 10 % levels, respectively.

could be that these important differences are driving the finding that companies with shareholder liability had higher costs of capital.

6. Firm size and shareholder liability

Given the additional risks to them, investors may have preferred the removal of shareholder liability, and companies may have viewed this as a way to reduce their cost of capital. Nevertheless, shareholder liability was there for a reason, namely to reassure policyholders that their policies would be honored.

Another way to encourage confidence amongst customers was by demonstrating the stability of the business. It is notable that when insurance firms were advertising, they were very likely to report their size. For example, taking a single day 23 January 1920, in *The Times*[10] alongside a special section about insurance, there were 22 display adverts by insurance firms, of which 16 (73 %) reported as one of the key features the magnitude of their firm, such as 'Assets exceed £X million'.

Table 1 illustrated how the total assets of the industry increased dramatically. Much of this was due to organic growth. This was partly due to increased consumer demand, and the increased use of agents to market the products (Supple, 1970, p.285). As a result, the number of life insurance policies in existence in the UK rose from 10.1 m in 1887, to 20.5 m in 1900, to 34.0 m in 1930.[11] Meanwhile, as also shown in Table 1, the number of companies fell due to an amalgamation wave, leading to further increases in company size.

The stability of the larger insurance companies was acknowledged, with the *Financial Times* suggesting that 'the failure of any of the leading British insurance companies is inconceivable'.[12] We now therefore explore the hypothesis that shareholder liability was able to be expunged because insurance companies increased in size. In Table 5, for each year of our sample, we split companies into terciles based on their total assets. As can be seen from this table, the differences between large and small firms were substantial and grew over time. For every year of the sample, there was also a highly significant difference in the uncalled capital to assets ratio between large and small firms.

The results in Table 5 have also been tabulated for equity (paid-up capital plus reserves from retained profits) to assets, and also show a highly significant difference between large and small firms for each year of our sample. This suggests that similar dynamics were at play, with larger firms needing to hold less of a capital cushion (from either uncalled or paid-up equity), as they were more diversified. Losses on policy payouts, or from declines in the value of their investments, could be absorbed more easily, whereas smaller firms had to set aside a much larger buffer.

In Appendix Table 4, we run univariate cross-sectional regressions explaining capital ratios in terms of the size of the firm. Panel A regresses the uncalled capital to asset ratios of all the insurance companies in a particular year against the size of their assets. For each year, there is a highly significant negative relationship, confirming that larger firms tended to hold lower levels of uncalled capital to assets. Similarly, Panel B regresses the paid-up capital and reserves to assets ratio against size,

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[10] *The Times*, 23rd January 1920, pp. 36-39
[11] Board of Trade Reports, 1887, 1900, 1911

[12] *Financial Times*, 14th June 1937, Special Insurance Review, p. II.

Table 4
Fama-MacBeth regressions explaining returns.

	1830 – 1869			1870 – 1899			1900 - 1929		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Uncalled	0.182**	0.062	0.089	0.162**	0.179**	0.281**	0.403***	0.360***	0.320***
	(0.078)	(0.091)	(0.114)	(0.072)	(0.078)	(0.120)	(0.080)	(0.087)	(0.104)
lnMarketCap		−0.066			0.012			−0.058	
		(0.041)			(0.026)			(0.036)	
lnPaidupEquity			−0.031			0.054			−0.089*
			(0.043)			(0.036)			(0.047)
DivYield		0.068***	0.082***		0.019	0.018		0.044	0.050*
		(0.026)	(0.025)		(0.018)	(0.019)		(0.027)	(0.028)
Liquidity		0.309	0.226		0.100	0.032		0.214	0.154
		(0.192)	(0.187)		(0.129)	(0.135)		(0.188)	(0.197)
Beta		0.009	0.018		−0.002	−0.005		0.117	0.115
		(0.094)	(0.096)		(0.044)	(0.043)		(0.087)	(0.086)
Constant	0.402***	0.931*	0.425	0.451***	0.199	−0.332	0.475***	0.885*	1.253**
	(0.057)	(0.534)	(0.545)	(0.049)	(0.356)	(0.458)	(0.100)	(0.485)	(0.579)
Observations	15,586	13,761	13,761	32,802	30,040	30,040	23,389	22,169	22,169
R-squared	0.023	0.229	0.224	0.008	0.105	0.104	0.012	0.150	0.145
Number of groups	480	468	468	360	360	360	355	355	355

Notes: This table presents the results of monthly Fama-MacBeth regressions on monthly total stock returns from January 1830 to December 1929. The Fama–MacBeth regressions are carried out by regressing the monthly total stock returns (winsorized at a 1 and 99 % level to reduce the influence of any outliers) on individual stocks in year y on several explanatory variables. These variables are determined in the December of year y-1 to set up the regressions for each month in the following year y. *Uncalled* is the proportion of a stock's capital that was uncalled, calculated as (Nominal - Par)/Nominal at the end of the previous year. *Beta* is the coefficient from a regression of the stock's return, against the return on a market index consisting of all equities (from all industries) included in the *COE* and *IMM*, controlling for the risk-free rate, using a window of 36 months up to the end of the previous year. Where a company had not traded for a full 36 months, beta is estimated using a 12-month window. Estimates are winsorized at a 1 and 99 % level. *Liquidity* is the proportion of months for which the stock's price changed, indicating that it traded. *lnMarketCap* is the natural log of the market capitalization of the company. Where a company issued multiple classes of equity, the sum is taken across classes. *lnPaidupEquity* is the natural log of the paid-up value of equity in the company calculated as the number of shares multiplied by the par value of each share at the end of the previous year. Where a company issued multiple classes of equity, the sum is taken across classes. *DivYield* is the dividend yield of the stock and is a proxy for the stock's value. Monthly stock price data from 1830 to 1868 was obtained from the *Course of the Exchange*, and monthly stock price data from 1869 to 1929 was obtained from the *Investor's Monthly Manual*. ***, **, and * indicate significance at the 1 %, 5 %, and 10 % levels, respectively.

and also finds a highly significant negative relationship each year. Panel C analyzes the combined value of uncalled capital, paid-up capital and reserves to assets, and reaches the same conclusion.

In Table 6, we run panel regressions to examine the relationship across years. Panel A shows the association in terms of levels. The first column confirms a highly significant connection between size and the uncalled to assets ratio. Similarly, the second column shows a significant negative relationship between size and the paid-up capital and reserves to assets ratio, with the third column confirming the connection between size and the combined value of uncalled and paid-up capital to assets.

In Panel B, we repeat the analysis in terms of differences. For companies which existed in any consecutive periods, we calculate the change in size and the change in the capital ratios. Notably, we again find highly significant negative relationships. This demonstrates that companies which grew most also tended to experience the largest reductions in their uncalled capital to assets ratios. It is likely that this pattern emerged due to companies increasing in size, but not increasing their uncalled capital at a similar rate.

7. Organic growth and mergers

Our analysis suggests that an increase in company size played an important role in the decline of uncalled capital. In this section, we analyze the role of organic growth and mergers in driving changes in company size and uncalled capital.

In Table 7 we break down the changes within the industry into those which resulted from changes within Continuer companies (those which existed in consecutive periods), those who Exited (either due to mergers or failure), and those who Entered (any new companies).

Panel A shows the number of companies in each category during each period. In 1880 there were 88 companies, and by 1900 this had grown to 119. This overall change hides substantial churn, with 63 companies continuing for the whole period, 25 exiting, and 56 joining.

In subsequent periods, the number of exits exceeded entrants, leading to a smaller number of companies overall.

In Panel B we analyze the absolute value of uncalled capital for each group. Amongst Continuers, this increased from £49.6 m in 1880 to £55.8 m in 1900, an increase of 13 % as shown in column 10, and increased again from 1900 to 1911. It declines in real terms from 1911 to 1923, but in nominal terms it increased, again suggesting that Continuer companies were still reluctant to explicitly reduce the nominal value of uncalled capital. It was not until the period from 1930 until 1965 that uncalled capital was dramatically reduced by these firms.

Panel C shows how the assets of these firms changed over time. These Continuer companies approximately doubled their asset size in real terms during most sub-periods, as shown in column 10. The net effect on the uncalled capital to assets ratio can be seen in Panel D, with large declines of over 40 % in each sub-period, again shown in column 10. For those companies which continued to exist, there appears to have been a reluctance to reduce their existing uncalled capital, but they let it stagnate whilst the business grew dramatically.

The net impact of companies who Exited compared to those who Entered can also be seen from Table 7. Panel A shows that, after 1900, the number of exits outpaced entrants. Panel B reveals the dramatic impact of these changes on the absolute value of uncalled capital. Panel C shows that the assets of the exits were also greater than the entrants, so the net impact on the uncalled capital to assets ratio, shown in Panel D, was less dramatic.

These results suggest that there were two factors at play in terms of overall industry trends. Continuer companies generally kept the absolute value of uncalled capital fairly stable but, given their high growth in assets, there was a large fall in the relative uncalled capital to assets ratio. It was the exit of companies which reduced the absolute value of uncalled capital within the sector, and which also contributed to the relative decline in the uncalled capital to assets ratio.

In Appendix Table 5 we further explore the approach taken by

Table 5
Average capital/assets by size of company.

Year	Size	Assets (£ million)	Uncalled / Assets	(Paid-up + Reserves) / Assets	(Uncalled + Paid-up + Reserves) / Assets
1880	Large	2.55	43.9 %	13.7 %	57.6 %
	Medium	0.57	159.9 %	34.1 %	194.0 %
	Small	0.08	175.5 %	66.3 %	241.8 %
	Diff	2.47***	−131.6 %***	−52.6 %***	−184.2 %***
1900	Large	4.53	39.9 %	20.5 %	60.4 %
	Medium	0.48	122.1 %	45.0 %	167.2 %
	Small	0.07	189.8 %	70.0 %	259.7 %
	Diff	4.46***	−149.9 %***	−49.5 %***	−199.3 %***
1911	Large	7.62	24.3 %	13.4 %	37.7 %
	Medium	0.38	74.5 %	44.2 %	118.7 %
	Small	0.06	147.6 %	62.6 %	210.2 %
	Diff	7.55***	−123.3 %***	−49.2 %***	−172.5 %***
1923	Large	9.63	9.3 %	10.8 %	20.1 %
	Medium	0.55	37.3 %	34.2 %	71.5 %
	Small	0.07	68.5 %	49.8 %	118.3 %
	Diff	9.57***	−59.2 %***	−39.0 %***	−98.2 %***
1930	Large	19.52	6.2 %	11.3 %	17.4 %
	Medium	1.68	9.5 %	22.4 %	31.9 %
	Small	0.10	50.7 %	52.0 %	102.8 %
	Diff	19.42***	−44.6 %**	−40.8 %***	−85.3 %***
1965	Large	55.79	0.0 %	8.1 %	8.1 %
	Medium	2.92	1.0 %	16.6 %	17.6 %
	Small	0.43	1.5 %	43.1 %	44.6 %
	Diff	55.36***	−1.5 %*	−35.0 %***	−36.5 %***

Notes: All British and Irish non-subsidiary insurance companies for each year are ranked according to their total assets, and classified into three equally sized portfolios, Large, Medium and Small. All asset values are deflated using the Retail Price Index to constant 1900 prices and the average within each portfolio is reported. The ratios of uncalled capital to assets, and paid-up capital and reserves to assets, are calculated for each company, and the average within each portfolio is also reported. *t*-tests for the differences in means between the Large and Small portfolios are calculated for each year, and for each variable, and ***, **, and * indicate significance at the 1 %, 5 %, and 10 % levels, respectively.

Table 6
Panel regressions explaining capital/assets.

Panel A: Levels of capital ratios			
	(1) Uncalled / Assets	(2) (Paid-up + Reserves) / Assets	(3) (Uncalled + Paid-up+Reserves) / Assets
lnAssets	−0.301***	−0.066***	−0.366***
	(0.054)	(0.011)	(0.063)
Constant	4.742***	1.231***	5.973***
	(0.727)	(0.153)	(0.841)
Observations	587	587	587
Number of Companies	269	269	269
Overall-R^2	0.131	0.434	0.208

Panel B: Changes in capital ratios			
	(1) Change in Uncalled / Assets	(2) Change in (Paid-up+Reserves) / Assets	(3) Change in (Uncalled + Paid-up + Reserves) / Assets
DlnAssets	−0.438***	−0.031*	−0.470***
	(0.153)	(0.016)	(0.160)
Constant	0.011	−0.037***	−0.026
	(0.098)	(0.010)	(0.103)
Observations	316	316	316
Number of Companies	146	146	146
Overall-R^2	0.215	0.043	0.218

Continuer companies, by examining when their absolute level (in nominal terms) of uncalled capital increased, remained unchanged, or decreased. The most common outcome between consecutive periods was for it to remain unchanged. These results suggest that uncalled capital

was 'sticky', with companies generally reluctant to decrease it if it already existed. When they did explicitly reduce it, the effects were mitigated by increasing paid-up equity.[13]

The process of capitalization of reserves was responsible for finally expunging uncalled capital in 21 companies (out of a total of 257 for which we have final outcome information), with it being mostly used from the 1930s onwards, as shown in Table 8. There are also a few cases of it ending due to a call on capital, or by the cancellation of the uncalled component. However, in the majority of cases, uncalled capital disappeared due to the company ceasing to exist. There are some cases of failure or voluntary liquidation, but by far the most common reason was due to a merger or acquisition.

To examine this further, we attempt to find balance sheet data for both the targets (which ceased to exist) and the bidders (that took over the company) within each sub-period. We then record the size of each firm, and its uncalled capital, at the start of the sub-period. Using this information, Table 9 shows that bidders were significantly larger than targets, and in most sub-periods they were about five times the size. Given the patterns already discussed, with larger companies having less uncalled capital, this meant that the bidders had lower average uncalled capital to assets ratios than the targets. The net effect of this was that many small companies with high levels of uncalled capital were removed from the industry. The large companies, which had lower uncalled capital, grew even larger.

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[13] Reports of company meetings indicate that a gradualist approach was often used. For example, Royal Insurance phased out uncalled capital over a 30-year period, as documented in reports of company meetings. Some retained profits were used to raise the par value of the shares, which had the effect of simultaneously reducing uncalled capital, and increasing equity, but without the need to call up any additional capital from shareholders. *The Times*, May 12, 1914, p.20; *The Times*, May 22, 1928, p.24; *The Times*, May 23, 1939, p.24; *The Times*, April 13, 1945, p.9.

Table 7
Growth ratios within industry (in constant 1900 prices).

Year Start (1)	Year End (2)	Overall Start (3)	Overall End (4)	Continuers Start (5)	Continuers End (6)	Exited (7)	Entered (8)	Overall Start/ Overall End (9) =(4)/(3)	Continuers Start / Continuers End (10) =(6)/(5)	Entries/ Exits (11) =(8)/(7)
Panel A: Number of companies										
1880	1900	88	119	63	63	25	56	1.35	1.00	2.24
1900	1911	119	112	73	73	46	39	0.94	1.00	0.85
1911	1923	112	85	59	59	53	26	0.76	1.00	0.49
1923	1930	85	69	65	65	20	4	0.81	1.00	0.20
1930	1965	69	56	34	34	35	22	0.81	1.00	0.63
Panel B: Uncalled capital (£m)										
1880	1900	56.8	71.6	49.6	55.8	7.2	15.8	1.26	1.13	2.18
1900	1911	71.6	54.9	48.1	50.8	23.5	4.1	0.77	1.06	0.17
1911	1923	54.9	25.8	38.1	23.3	16.8	2.4	0.47	0.61	0.14
1923	1930	25.8	23.8	22.6	23.7	3.2	0.0	0.92	1.05	0.02
1930	1965	23.8	0.4	8.4	0.4	15.3	0.1	0.02	0.04	0.00
Panel C: Assets (£m)										
1880	1900	101.8	228.7	92.5	212.7	9.3	16.0	2.25	2.30	1.72
1900	1911	228.7	346.6	195.2	342.1	33.5	4.6	1.52	1.75	0.14
1911	1923	346.6	326.0	289.8	314.9	56.8	11.0	0.94	1.09	0.19
1923	1930	326.0	555.0	313.9	554.5	12.1	0.5	1.70	1.77	0.04
1930	1965	555.0	1175.9	413.6	1068.4	141.4	107.5	2.12	2.58	0.76
Panel D: Uncllaed capital / assets (%)										
1880	1900	55.8 %	31.3 %	53.6 %	26.2 %	77.7 %	98.4 %	0.56	0.49	1.27
1900	1911	31.3 %	15.8 %	24.6 %	14.8 %	70.2 %	89.4 %	0.51	0.60	1.27
1911	1923	15.8 %	7.9 %	13.1 %	7.4 %	29.5 %	21.9 %	0.50	0.56	0.74
1923	1930	7.9 %	4.3 %	7.2 %	4.3 %	26.2 %	10.0 %	0.54	0.59	0.38
1930	1965	4.3 %	0.0 %	2.0 %	0.0 %	10.8 %	0.1 %	0.01	0.02	0.01

Notes: This table displays the sums of uncalled capital and assets, for all British and Irish non-subsidiary insurance companies, for which all of this data is available for all years that they are in the sample. This reduces the sample size slightly compared to Table 1, which included any companies with this data for any particular year. This is to ensure that companies do not appear to exit and then re-enter at a later date, when it was just due to missing data for a particular year. All values are deflated using the Retail Price Index to constant 1900 prices. The ratios between uncalled capital and assets using these industry sums are also reported. *Continuers* are defined as those companies which are in our sample at the start and end of each particular period. *Exited* are those which existed at the start, but not at the end, of a period. *Entered* are those which existed at the end, but not at the start, of a period. Columns 9, 10, and 11 calculate the ratio between the start and end of each period, with 1.0 indicating no change, less than 1.0 indicating a real decline, and greater than 1.0 indicating a real increase.

Table 8
Events coinciding with the expunging of shareholder liability.

	Merger or Acquisition	Voluntary Liquidation	Court Winding Up	Capitalization of Reserves	Call on Capital	Cancelling of Uncalled Capital
1880 – 1899	33	5	5	0	0	0
1900 – 1910	46	7	2	0	0	0
1911 – 1922	56	9	10	1	0	0
1923 – 1929	17	4	4	2	0	0
1930 – 1964	20	4	3	18	7	4
Total	172	29	24	21	7	4

Notes: This table reports the events that coincided with an insurance company expunging its shareholder liability by decade. These events have been identified from the capital histories from *Stock Exchange Yearbooks*, the *Register of Defunct Companies*, and searches of the *Financial Times*. An explanation of the outcomes is as follows. *Merger*: an insurance company with shareholder liability was taken over by another insurance company. *Voluntary Liquidation*: the shareholder liability was expunged as a result of the company being voluntarily liquidated and the capital returned to shareholders. *Court Winding Up*: the insurance company ceased to have shareholder liability because it failed, and was not taken over by another insurance; *Capitalization of Reserves*: the shareholder liability was expunged by paying up the remaining uncalled capital from its reserves; *Call on Capital*: the shareholder liability was expunged as a result of a call on the capital of shareholders; *Cancelling of Uncalled Capital*: the shareholder liability was expunged by cancelling the uncalled capital of the company, and nothing else happened. There were another 20 companies with uncalled capital at their final observation for which we cannot determine an outcome. There were also 14 companies which became fully paid within our sample period, but we cannot determine by which method. There were 58 companies, mostly established in the latter half of the sample period, that were always fully paid since their inception.

The patterns of mergers also tended to increase diversification. Some of the insurance firms had initially focused on just one product, such as life, fire, or marine insurance. However, others had become composite insurers. It was these that tended to also be the acquirers in mergers. Of the 113 mergers for which we have data on both the bidder and the target, 96 of them (85 %) were initiated by firms that were already composite. In about half of these cases, they took over another company that was also already composite, and in the other half they took over single-product firms.

8. Confounding variables

Our results have suggested that size was closely associated with the level of uncalled capital, and that increases in size were connected to the reduction in uncalled capital over time. We have argued that this can be explained by economies of scale, with larger insurance firms being more diversified and less likely to need uncalled capital as a buffer against losses. However, it is likely that many variables were related to size, and it is possible that there may be confounding variables which were the true determinants of uncalled capital. To explore this, we collect additional data across a number of possible factors, including stock market

Table 9
Acquisition analysis.

	Targets	Bidders	Average Assets			Average Uncalled/Assets		
			Target (start of period)	Bidder (start of period)	Difference	Target (start of period)	Bidder (start of period)	Difference
1880 - 1899	18	13	0.49	2.27	1.78***	131.1 %	102.1 %	−29.0 %
1900 - 1910	39	17	0.91	5.22	4.31***	155.7 %	59.8 %	−95.9 %**
1911 - 1922	33	19	1.22	8.78	7.57***	93.1 %	33.9 %	−59.1 %***
1923 - 1929	11	8	0.71	11.62	10.91***	76.4 %	9.6 %	−66.8 %**
1930 - 1964	12	11	5.34	26.22	20.89*	11.0 %	4.3 %	−6.7 %**
Total	113	68	1.38	8.65	7.26***	110.4 %	48.2 %	−62.2 %***

Notes: For each insurance company which ceased to exist as an independent company an attempt was made to find if there was an acquiring company, using *Stock Exchange Yearbooks*, the *Register of Defunct Companies*, Raynes (1964), and searches of *The Times* and *Financial Times*. All acquisitions which have been identified, and for which the assets and uncalled capital/assets ratio of both the target and the bidder are available at the start of a given period, are included in the analysis. The number of target companies exceeds the number of bidders as an acquirer often purchased multiple firms. All asset values are deflated using the Retail Price Index to constant 1900 prices, and the average assets at the start of a given period, for companies which would be targets or bidders during the period, are reported. The average uncalled capital/asset ratios for targets and bidders is also reported. *t*-tests for the differences in means between the targets and the bidders are also calculated for each period, and ***, **, and * indicate significance at the 1 %, 5 %, and 10 % levels, respectively.

Table 10
Covariates of size.

	(1)	(2)	(3)	(4)	(5)
LSEOfficialQuoted	1.459***				1.135***
	(0.210)				(0.211)
HeadLondon	1.512***				1.062***
	(0.345)				(0.372)
Unmarketable		−1.552**			−0.504
		(0.637)			(0.541)
ActuaryUnderwriter			0.947***		0.518***
			(0.196)		(0.171)
Manager				0.721***	0.541***
				(0.207)	(0.202)
DirectorNum				0.037	0.005
				(0.027)	(0.024)
DirChairMP				−0.295*	−0.332**
				(0.159)	(0.149)
DirChairLordSir				0.757***	0.520***
				(0.213)	(0.178)
VoteOnePerShare				0.690***	0.478***
				(0.172)	(0.167)
Constant	11.837***	13.549***	12.916***	11.728***	11.196***
	(0.215)	(0.101)	(0.080)	(0.365)	(0.399)
Observations	603	603	603	552	552
Number of Companies	280	280	280	263	263
Overall-R^2	0.202	0.094	0.260	0.160	0.308

Notes: Fixed effects panel regressions, with robust standard errors, with one observation per company for each of 1880, 1900, 1911, 1923, 1930 and 1965, where a company existed in those particular years. The dependent variable is *lnAssets*, which is the log of the total assets of the company deflated using the Retail Price Index to constant 1900 prices. *LSEOfficialQuoted* is a dummy variable which equals 1 if the company had an Official Listing on the London Stock Exchange. *HeadLondon* is a dummy variable which equals 1 if the company had its headquarters in London. *Unmarketable* is the proportion of assets which were held as mortgages, loans on policies, or loans on personal securities. *ActuaryUnderwriter* is a dummy variable which equals 1 if the company had a named Actuary or Underwriter. *Manager* is a dummy variable which equals 1 if the company had a named Manager, General Manager, or Managing Director, who was not the Chairman. *DirectorNum* is the number of directors, including the Chairman, on the Board. *DirChairMP* is a dummy variable which equals 1 if at least one of the Directors or Chairman was an MP. *DirChairLordSir* is a dummy variable which equals 1 if at least one of the Directors or Chairman had a nobility title such as Lord or Sir. *VoteOnePerShare* is a dummy variable which equals 1 if shareholder voting was on a one vote per share basis. Further details on the variables and sources are provided in Appendix Table 1.

regulations, professionalization of management, corporate governance, and reinsurance, with more detail on variable definitions and sources provided in Appendix Table 1.

In Appendix Table 6, we report the averages of each variable for each year of our sample. It is notable that the average uncalled capital to assets ratio consistently fell, whilst assets substantially increased. In terms of the other variables, there was generally not much change over time, with the exception of having a manager who was independent of the chairman, and the use of one vote per share rights for shareholders. We analyze the relationship of the possible confounding variables with size in Table 10, with the level of the uncalled capital to assets ratio in Table 11, and with changes in the uncalled capital to assets ratio in Table 12.

The first variable we consider is whether a company was on the Official List of the London Stock Exchange (LSE). During this era, there were numerous provincial stock exchanges operating in cities across Britain, as well as a Supplementary List in London. Fjesme et al. (2021) has recently shown that the Official List was a screening mechanism which only accepted higher quality companies. In Table 10 we regress a dummy variable for an LSE Official Listing against the size of the company, and control for whether the headquarters of the firm was in London, as these firms may have been less inclined to use a provincial listing. The results confirm that those on the Official List were significantly larger in size. However, Tables 11 and 12 show that having an Official Listing did not have a significant impact on the uncalled capital to assets ratio. These results are consistent with an examination of LSE Official Regulations (Melsheimer and Laurence, 1884, and Gore-Browne, 1902), which did not restrict the use of uncalled capital, so are

Table 11
Panel regressions explaining levels of the uncalled capital to assets ratio controlling for size-related factors.

	(1)	(2)	(3)	(4)	(5)
lnAssets	−0.309***	−0.298***	−0.300***	−0.313***	−0.326***
	(0.057)	(0.054)	(0.056)	(0.061)	(0.067)
LSEOfficialQuoted	0.085				0.098
	(0.087)				(0.097)
HeadLondon	−0.009				−0.028
	(0.206)				(0.223)
Unmarketable		0.097			0.052
		(0.196)			(0.255)
ActuaryUnderwriter			−0.004		0.036
			(0.071)		(0.071)
Manager				−0.145	−0.136
				(0.120)	(0.131)
DirectorNum				0.006	0.006
				(0.009)	(0.009)
DirChairMP				0.009	−0.001
				(0.054)	(0.058)
DirChairLordSir				−0.123	−0.125
				(0.093)	(0.091)
VoteOnePerShare				0.169*	0.163*
				(0.095)	(0.095)
Constant	4.827***	4.694***	4.739***	4.921***	5.048***
	(0.735)	(0.727)	(0.741)	(0.776)	(0.804)
Observations	587	587	587	539	539
Number of Companies	269	269	269	254	254
Overall-R^2	0.137	0.131	0.130	0.137	0.143

Notes: Fixed effects panel regressions, with robust standard errors, with one observation per company for each of 1880, 1900, 1911, 1923, 1930 and 1965, where a company existed in those particular years. The dependent variable is the *Uncalled/Assets* ratio of a company in a given year. *lnAssets* is the log of the total assets of the company deflated using the Retail Price Index to constant 1900 prices. *LSEOfficialQuoted* is a dummy variable which equals 1 if the company had an Official Listing on the London Stock Exchange. *HeadLondon* is a dummy variable which equals 1 if the company had its headquarters in London. *Unmarketable* is the proportion of assets which were held as mortgages, loans on policies, or loans on personal securities. *ActuaryUnderwriter* is a dummy variable which equals 1 if the company had a named Actuary or Underwriter. *Manager* is a dummy variable which equals 1 if the company had a named Manager, General Manager, or Managing Director, who was not the Chairman. *DirectorNum* is the number of directors, including the Chairman, on the Board. *DirChairMP* is a dummy variable which equals 1 if at least one of the Directors or Chairman was an MP. *DirChairLordSir* is a dummy variable which equals 1 if at least one of the Directors or Chairman had a nobility title such as Lord or Sir. *VoteOnePerShare* is a dummy variable which equals 1 if shareholder voting was on a one vote per share basis. Further details on the variables and sources are provided in Appendix Table 1.

unlikely to have been a major determinant of its decline.

We also examine the relationship between unmarketable securities, size and uncalled capital. The premiums that insurance companies received from customers were invested in a broad range of assets, with the aim of generating additional income. In the nineteenth century much of this was in unmarketable securities such as mortgages, but as the number and size of companies listed on stock markets increased, there was a shift towards publicly traded investments (Bogle et al., 2022). This may have improved transparency for investors in, and policyholders of, insurance companies and reduced agency problems, allowing the insurance firms to grow. When we regress unmarketable securities against size, in Table 10, we find a significant negative relationship confirming that companies with more mortgages and loans on policies tended to be smaller. However, when regressed against uncalled capital to assets, in Tables 11 and 12, there is no significant relationship. This suggests that the reduction in unmarketable securities during this era may have facilitated growth, but this was not the primary determinant of the reduction in the uncalled capital to assets ratio.

The next area that we explore is in terms of whether professionalization of management made uncalled capital less necessary as a buffer against losses. Under the regulations of the 1870 Life Assurance Companies Act and 1909 Assurance Companies Act, the assets of insurance companies operating under these acts had to be evaluated every five years by an actuary, but some firms also reported a permanent actuary, or underwriter, in employment. Table 10 confirms that the presence of these professionals was significantly more likely in large firms. However, Tables 11 and 12 again show that this did not translate into a significant impact on the uncalled capital to assets ratio.

We also analyze whether a company had a named Manager/Managing Director (who was not the Chairman). The internal governance structures were sometimes cumbersome within insurance companies.

For example, Raynes (1964, p.374) reports that for the Commercial Union, one of the larger firms, sectional matters were reported to the Board by the chairman of a committee, and it was only in 1901, after a threat of resignation, that a General Manager was appointed. In other firms, the Chairman may have been dominant. Appendix Table 6 shows that the proportion of firms with a General Manager rose from 41 % in 1880, to 87 % in 1930, and Table 10 confirms that this was more common in larger firms. However, Table 11 shows that having a Manager in place was not associated with the level of uncalled capital to assets. Nevertheless, Table 12 suggests that during the period when a Manager was introduced, there was a significant reduction in the uncalled capital to assets ratio.

We also consider several features of the Boards of Directors. Table 10 suggests that the size of the core Board was not directly linked to the size of the company.[14] Having a Member of Parliament, or a member of the nobility, may have given investors greater confidence in the respectability of the Board (Braggion and Moore, 2013). Our findings suggest that the presence of an MP was actually associated with smaller companies, possibly reflecting the support of a politician for local institutions, whilst having someone from the nobility was more common amongst larger firms. However, in Tables 11 and 12, neither Board size nor the political or noble titles of directors had any influence on the uncalled capital to assets ratios.

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[14] Some firms also appointed local boards, covering specific regions, with the larger companies sometimes having several hundred individuals listed as being a director. Information on local directors is not available for 1965, so is not included in the main analysis. However, regressions for 1880 to 1930 suggest that although the presence of local directors was associated with size, it did not have an impact on the levels or change in uncalled capital to assets.

Table 12

Panel regressions explaining changes in the uncalled capital to assets ratio controlling for size-related factors.

	(1)	(2)	(3)	(4)	(5)
DlnAssets	−0.441***	−0.437***	−0.435***	−0.444***	−0.440***
	(0.151)	(0.154)	(0.150)	(0.158)	(0.151)
DLSEOfficialQuoted	−0.077				−0.085
	(0.097)				(0.082)
DHeadLondon	0.181				0.135
	(0.133)				(0.130)
DUnmarketable		0.062			−0.010
		(0.191)			(0.235)
DActuaryUnderwriter			−0.072		−0.065
			(0.059)		(0.067)
DManager				−0.403***	−0.410***
				(0.099)	(0.104)
DDirectorNum				0.006	0.006
				(0.006)	(0.007)
DDirChairMP				−0.006	0.002
				(0.043)	(0.041)
DDirChairLordSir				0.081	0.079
				(0.068)	(0.067)
DVoteOnePerShare				0.012	0.019
				(0.059)	(0.060)
Constant	0.016	0.012	0.014	0.059	0.068
	(0.103)	(0.097)	(0.099)	(0.103)	(0.105)
Observations	316	316	316	283	283
Number of Companies	146	146	146	135	135
Overall-R^2	0.215	0.216	0.216	0.258	0.259

Notes: Fixed effects panel regressions, with robust standard errors, with one observation per company for each of 1880, 1900, 1911, 1923, 1930 and 1965, where a company existed in those particular years. The dependent variable is the change in the *Uncalled/Assets* ratio of a company since the previous time period. *DlnAssets* is the change in the log of the total assets of the company deflated using the Retail Price Index to constant 1900 prices. *DLSEOfficialQuoted* is the change in a dummy variable which equals 1 if the company had an Official Listing on the London Stock Exchange. *DHeadLondon* is the change in a dummy variable which equals 1 if the company had its headquarters in London. *DUnmarketable* is the change in the proportion of assets which were held as mortgages, loans on policies, or loans on personal securities. *DActuaryUnderwriter* is the change in a dummy variable which equals 1 if the company had a named Actuary or Underwriter. *DManager* is the change in a dummy variable which equals 1 if the company had a named Manager, General Manager, or Managing Director, who was not the Chairman. *DDirectorNum* is change in the number of directors, including the Chairman, on the Board. *DDirChairMP* is the change in a dummy variable which equals 1 if at least one of the Directors or Chairman was an MP. *DDirChairLordSir* is the change in a dummy variable which equals 1 if at least one of the Directors or Chairman had a nobility title such as Lord or Sir. *DVoteOnePerShare* is the change in a dummy variable which equals 1 if shareholder voting was on a one vote per share basis. Further details on the variables and sources are provided in Appendix Table 1.

We move on to analyze whether shareholder voting rights had any influence. In the nineteenth century, it was common to have a cap on votes for any one shareholder, or graduated voting rights which gave progressively less votes for each additional share that an investor held. Whilst this was pro-minority shareholders, it reduced the incentives and power of large shareholders to monitor the firm. There was a general shift over time towards the modern approach of one-share-one-vote (see Acheson et al., 2019), and in Table 10 we find that having this voting structure was more common amongst large firms. However, in Table 11 there is a suggestion that companies with these rights actually had a higher uncalled capital to assets ratio, and Table 12 shows there is no association with changes in the uncalled capital to assets ratio, which means it cannot explain the decline in extended liability over time.

Reinsurance happened throughout our period of analysis, occurring in a mixture of a facultative basis (i.e., a case-by-case basis, most notably in the 1900 Reassurance Agreement between various life offices), and on a more formal treaty basis. Data on explicit reinsurance premiums was not widely reported, but we have found information for about 15 % of our observations, and run separate analysis for them in Appendix Table 7. The results show that there was not a significant relationship between size and reinsurance. However, there is a suggestion of a positive connection between reinsurance and the uncalled capital to assets ratio, which becomes more significant when controlling for firm size. This is the opposite effect of an hypothesis which might imply that an increase in reinsurance facilitated a decline in uncalled capital. It suggests that companies may have used both reinsurance and uncalled capital as methods of managing risk, and that they were complementary to each other, rather than direct substitutes. Notably, after controlling for reinsurance, there is still a highly significant negative relationship between size and the uncalled capital to assets ratio, consistent with all of our previous results.

In summary, our results show that there are a number of variables which are related to size, and which could plausibly be argued are confounding variables. However, when regressed against uncalled capital to assets, they are generally not significant, whilst size remains highly significant. When we repeat the analysis looking at changes in variables, the change in size also remains significantly associated with the change in uncalled capital to assets.

9. Conclusions

This paper has argued that shareholder liability disappeared from the UK insurance industry because it was associated with a higher cost of capital. Firms were able to remove it because they had grown in scale and scope, which made them better able to pool risk. This meant that there was less need for shareholder liability as a buffer to shocks.

Our findings ultimately show that shareholder liability disappeared in the insurance sector as it was no longer required, because of the increasing size of insurance firms. It essentially withered on the vine because of the changing landscape of the industry. The same could plausibly be argued for British banking, with shareholder liability disappearing after banks had merged and grown. This contrasts with the experience of the U.S. banking system. The branching restrictions which were a defining part of the system prevented U.S. banks from the growth necessary to remove extended liability. It took the emergence of deposit insurance before U.S. banks could shed their shareholder liability (Wilson and Kane, 1996).

The change in shareholder liability was managed successfully over a sustained period of time. From a wider industry and societal perspective, however, it may have increased the likelihood of insurance companies

failing. Indeed, the introduction of supervision in 1973 and a safety net in 1975 lends support to this view.

As we have already seen, our finding that the increase in insurance company size explains the demise of shareholder liability likely translates well into other financial services such as banking, but does it help us understand the removal of shareholder liability in non-financial sectors? It is interesting to note that other industries in the UK moved away from shareholder liability much more quickly than the financial sectors did. As soon as they legally could, i.e., the late 1850s, firms in other industries tended to move to limited liability. For these firms, uncalled capital was of little benefit to customers, it would only have been valuable in terms of assuring bondholders and other creditors that they would be repaid. An assessment of the wider economic effects of this transition to limited liability in other sectors merits further study.

CRediT authorship contribution statement

David A. Bogle: Conceptualization, Data curation, Formal analysis, Methodology, Software, Visualization, Writing – original draft, Writing – review & editing. **Gareth Campbell:** Conceptualization, Data curation, Methodology, Software, Validation, Visualization, Writing – original draft, Writing – review & editing. **Christopher Coyle:** Conceptualization, Formal analysis, Investigation, Methodology, Supervision, Visualization, Writing – original draft, Writing – review & editing. **John D. Turner:** Conceptualization, Data curation, Methodology, Project administration, Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

Data will be made available on request.

Why did shareholder liability disappear? (Original data) (Mendeley Data)

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