For Richer, for Poorer

Bankers' Liability and Risk-taking in New England, 1867-1880*

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Abstract

We study whether banks are riskier if managers have less liability. We focus on New England between 1867 and 1880 and consider the introduction of marital property laws that limited liability for newly wedded bankers. We find that banks with managers who married after a legal change had more leverage, were more likely to "evergreen" loans and violate lending rules, and lost more capital and deposits in the Long Depression of 1873-1878. This effect was most pronounced for bankers with wives from relatively wealthy families. We find no evidence that limiting liability increased firm investment at the county level.

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Banks carry large debts relative to capital, largely in the form of deposits. At the same time, owners and management face limited liability. As such, they can cash in on a bank's profits while shifting losses to depositors and other debt holders. This encourages risk-taking, contrary to the interests of depositors, and, potentially, society as a whole. Lawmakers have been aware of this moral hazard problem for as long as deposit-taking banks have existed. In response, they used to force bank owners – which generally included managers – to shoulder significant downside risk. For example, during much of the 19th century, bank shareholders in the U.K. faced unlimited liability (Turner 2014). In the U.S., most faced "double liability," which became the norm after the Banking Act of 1863 (Macey and Miller 1992). For each $1 invested in the bank, shareholders could lose $2. Double liability fell out of fashion after the Great Depression, and was largely abolished in the U.S. by 1933 (Mitchener and Richardson 2013).

The 2008 crisis has sparked renewed interest in the question how much downside risk bankers should bear. Some view bank managers' limited liability, or lack of "skin-in-the-game," as one of the culprits of the crisis.[1] Many commentators argue that the financial sector would be more stable if bank managers shouldered more downside risk and have called for the re-introduction of more stringent liability rules.[2] For example, past bonuses could be "clawed back" if a bank suffers a loss.[3] At the same time, it is not obvious that increasing managers' liability will effectively reduce banks' risk-taking. Reputational concerns, the

[1]Several studies indicate that bank managers – including those at Bear Stearns and Lehman Brothers – earned more immediately before failing than they lost afterwards (Bebchuk, Cohen and Spamann 2010; Bhagat and Bolton 2014; Cziraki 2016).

[2]See Rajan (2008), Blinder (2009), Hill and Painter (2015, p. 190), Kay (2015, p. 279), Luyendijk (2015, p. 254), and Cohan (2017, p. 146). Admati and Hellwig (2012, p. 122-125) point out that raising capital requirements, though an important first step, might not be enough to reduce risk-taking if there are agency conflicts between management and owners. If manager compensation depends on short-term performance and there are no claw-back mechanisms, bank managers have an incentive to shift risk to shareholders, hide the risks they take, and push potentially negative outcomes into the future. For empirical evidence, see Saunders, Strock and Travlos (1990) and Falato and Scharfstein (2015).

[3]A number of policy proposals include such claw-back mechanisms, but most are limited to punishing explicit wrong-doing rather than discouraging risk-taking. For example, in the U.S., the Dodd-Frank Act proposes claw-backs of bonuses awarded after erroneous accounting (yet to be adopted; https://www.sec.gov/rules/proposed/2015/33-9861.pdf). In the U.K., bank managers may now have their bonuses clawed back in case of misconduct (https://www.bankofengland.co.uk/prudential-regulation/publication/2014/clawback)

fear of losing bank-specific human capital, and active monitoring by depositors and other stakeholders may be sufficient to curb risky behavior, rendering such a measure redundant.[4]

Despite the interest in the topic, and its relevance for policy, there is little direct evidence that increasing the liability of bank managers reduces risk. In recent years, bank managers' liability has generally been limited, and it is difficult to observe the counterfactual. Commentators often point to the fact that investment banks, traditionally partnerships with unlimited liability, became much riskier in the 1980s when they went public. However, this evidence is largely anecdotal, based on a limited number of observations, and coincides with a period of general financial deregulation. More recently, there are differences across banks in the degree to which managers' compensation depends on the share price, but this primarily affects managers' upside, as shares have limited liability and banks are highly levered (Becht, Bolton and Roëll 2011). As a result, high sensitivity to the bank's share price is usually associated with more risk-taking, not less.[5]

In this paper, we evaluate the extent to which historically stricter liability rules for bank managers were effective at reducing risk. We focus on a setting in which we observe plausibly exogenous variation in bank managers' downside exposure. We study banks in New England[6] between 1867 and 1880. At the time, bank CEOs (presidents) owned a large fraction of their banks' shares, which carried double liability. If a bank failed, unable to repay creditors, the Comptroller of the Currency could seize additional assets from shareholders up to the value of the initially paid-in capital. This period intersects with a major change in the marital

[4]In fact, the empirical evidence that management and equity holders can successfully shift risk to creditors is mixed. For example, Andrade and Kaplan (1998), Rauh (2009), Gropp, Hakenes and Schnabel, (2010), and Gilje (2016) find no evidence, while Esty (1997), Eisdorfer (2008), and Landier, Sraer, and Thesmar (2012) do.

[5]See Shue and Townsend (2018) for general evidence that CEOs with option-like payoffs take more risk. Mehran, Morrison and Shapiro (2011) provide an overview of the empirical work on banker compensation and the 2008 crisis. Fahlenbrach and Stulz (2011) and Berger, Imbierowicz and Rauch (2015) document that banks in which managers own more shares performed worse and tended to fail more. In contrast, Carlson and Calomiris (2016) find that banks were less likely to fail during the crisis of 1893 if managers owned more shares (which they instrument with management turnover). A possible explanation for these different results is that, in the 1890s, banks had lower leverage and double liability for shareholders. Gorton and Rosen (1995), in a study of U.S. banks in the 1980s, document a U-shaped relation between ownership and risk, which they attribute to moral hazard frictions between shareholders and management.

[6]Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island and Vermont.

property regime. Under the existing common law, ownership of women's property transferred to their husbands upon marriage. Starting in the 1840s, states in New England introduced Married Women's Property Acts (MWPAs) that allowed newly married women to retain separate ownership over their property. This introduces variation in the downside exposure faced by bank presidents. If a president was married before the enactment of a MWPA, all of his family's assets were at stake; if he was married after, his wife's separate assets were protected. The larger the proportion of household assets standing in the wife's name, the more protection was afforded. We investigate whether a bank president took more risk if he faced less downside exposure. We measure risk through (1) leverage, (2) the propensity to "evergreen" loans, (3) the propensity to make loans in violation of regulation, and (4) ex post losses of capital and deposits. Importantly, we can measure the impact of limited liability on risk-taking *keeping constant* the regulatory environment, time, and place.

The context that we consider differs from today in two key dimensions: in the 1860s and 1870s there was no deposit insurance, and banks were too small to be considered "too-big-to-fail." This means that moral hazard problems induced by (implicit) government guarantees only played a marginal role. Moreover, individual depositors had a clear incentive to monitor the banks themselves and exert discipline on banks' management (Calomiris and Kahn 1991; Diamond and Rajan 2000, 2001; Calomiris and Carlson 2016). Rather than a weakness, we see this as a strength of the paper. We are able to isolate the effect of bank managers' liability on bank behavior absent bailout expectations and under close scrutiny of depositors.

Our evidence indicates that reducing bankers' liability increased risk-taking. Banks managed by presidents married after a MWPA had more leverage, were more likely to evergreen loans and violate lending rules, and lost more capital and deposits in the Depression of 1873-1878. We document that the effect is stronger for bank presidents married to richer women. Variation in the marital property regime under which a bank president was married comes from four sources: (1) different timing of states introducing a MWPA, (2) the banker's age, (3) the timing of the banker's first marriage, and (4) possible remarriage after the death of an

earlier spouse (divorce was rare). States introduced the MWPAs at different points in time, and bankers tended to get married at different ages. That means that we can simultaneously include fixed effects for (1) the state (or county) a bank president lived in, (2) age and (3) age at first marriage. Doing so, we difference out any spurious effects coming from a banker's age or state of residence, as well as a banker's decision to marry later in life. We do not difference out variation coming from remarriage, as this generally occurred if the banker's first wife died, which we view as exogenous.

We close by exploring the real effects of increasing bankers' liability. It is not obvious that reining in risk-taking is socially optimal, if this leads to underinvestment in risky projects with positive net present value. We investigate this issue using a sample of about 1,000 firms from the 1870 Census of Manufacturers. We study the decision to introduce a new technology in need of high up-front investment: steam power. We find that firms in counties with more banking capital are more likely to use steam power. However, it makes no difference whether this bank capital is managed by presidents married before or after a MWPA.

Related literature. A limited number of papers directly study the impact of downside exposure on managerial incentives. Cole, Kanz and Klapper (2015) use an experimental setting to study the effect of bank loan officers' compensation schemes on (hypothetical) lending decisions. They find that increasing loan officers' liability leads to more screening and safer loans. Wei and Yermack (2011) study the impact of the disclosure of CEOs' "inside debt" positions on equity and bond prices for listed non-financial firms. Inside debt is defined as pensions and other deferred compensation. After disclosure, the equity prices of firms with more inside debt fell, while bond prices increased, indicating that more inside debt was associated with less risk-taking. Schoenherr (2017) studies a change in the Korean bankruptcy law, allowing firm managers to keep their jobs after bankruptcy. He shows that this increases risk-taking.

This paper relates to an historical literature on the impact of shareholder liability on bank performance. Acheson and Turner (2006) and Turner (2014, p. 118) argue that the unlimited

liability of bank shareholders in the U.K. in the 19th century reduced risk-taking. In the U.S., most banks had double liability, but some state-regulated banks enjoyed limited (or "single") liability (Macey and Miller 1992).[7] Esty (1998) analyzes a sample of 84 banks for three U.S. states from 1910 to 1915 and suggests that single liability led to investment in riskier assets. Using aggregate state level data, Grossman (2001) shows that, outside of periods of widespread financial distress, banks in single liability states were more likely to fail. Banks regulated at the national level all had double liability. Mitchener and Richardson (2013) use these national banks to control for common economic shocks. Using aggregate state level data, they find that banks in single liability states took on more leverage. Aldunate, Jenter, Korteweg, and Koudijs (2018) find that single liability banks were more likely to fail during the Great Depression. A key difference between our paper and this literature is that we focus on the personal liability of bank managers, not that of general shareholders. In addition, our analysis is based on within-state differences between individual banks, lessening the concern that states with different liability regimes might have been different in other dimensions.

The remainder of this paper is structured as follows. Section 1 provides historical details, including examples of the mechanism we have in mind. Section 2 introduces a simple model to understand the impact of additional personal liability on risk-taking. Section 3 discusses the new dataset constructed for this paper. Section 4 presents the empirical results. Section 5 provides a number of robustness tests. Section 6 concludes.

1 Historical background

1.1 Banking in New England

We study the commercial banking sector in New England between 1867 and 1880. All banks were unit banks (that is, they did not have any additional branches) and predominantly took

[7] In New England, these state regulated banks only became important after 1885, outside the period studied in this paper.

deposits and extended loans locally. We focus on national banks, which were regulated at the national level by the Comptroller of the Currency (OCC).[8]

The table below provides a simplified balance sheet of a typical bank.

Assets		**Liabilities**	
Reserves		Deposits	
Loans and discounts	Commercial paper	Capital	Paid-in capital
	Accommodation paper		Retained earnings
Securities			
Government bonds		Bank notes	

We can divide the activities of the bank in two. First, the bank made loans to the local business community, which it funded with its capital and by issuing demand deposits. Loans consisted of commercial paper and loans to local business men on personal security (accommodation loans). Deposits were checkable and were used as part of the payment system. The local depositor base was wide; local businesses and affluent individuals typically had an account. Usually, deposits paid no interest, but there are instances of banks offering higher interest rates to attract depositors.[9] To insure the bank against possible runs, some deposits were held as reserves. This part of the balance sheet had significant scope for risk taking: banks could issue more deposits to lever up, make riskier loans, and hold fewer reserves against deposits.

Second, the bank issued banknotes. At the time, there was no central bank that could print money. Instead, the national banks issued banknotes backed by government securities.[10] The bank paid no interest on these banknotes, but did earn interest on the bonds,

[8]There were also *state* regulated commerical banks, but in 1870s New England these only played a minor role. For example, in 1879 there were a total of 544 National Banks, with a joint capital of $164.43 million. In the same year there were 40 State banks and trust companies with a combined capital of $7.10 million *Annual Report of the Comptroller of the Currency* 1879, p. V-VI

[9]Unfortunately, the information on interest rates on deposits is highly incomplete and not suitable for statistical analysis.

[10]National banks were allowed to issue banknotes up to 90% of the value of (federal) government securities they had on the books. The issuance of banknotes could not exceed the amount of paid-in capital. National Banking Act, 1864, Sect. 21.

providing a safe and steady stream of income. This activity provided little scope for risk-taking and we largely ignore this part of the banks' business in the paper.

1.2 National bank regulation

The OCC imposed a number of regulations on the national banks. We list the most important ones.

First, a bank was required to have a minimum dollar amount of paid-in capital that depended on the population of the town or city a bank was located in.[11] To the degree that population size lined up with credit demand, this acted as a rudimentary minimal capital-ratio requirement.

Second, in addition to paid-in capital, a bank had to hold a "surplus fund" of retained earnings of at least 20% of paid-in capital. The surplus was protected by a set of rules limiting the bank's ability to make dividend payments. Most importantly, if a bank had to write down bad loans, it was typically forced to cut dividends.[12]

Third, there was a reserve requirement. Outside of Boston, banks had to hold 15% of deposits and banknotes in the form of legal reserves, 60% of which could be in the form of deposits with so-called reserve city banks in Boston and New York. Banks in Boston had to hold 25% of deposits and banknotes as reserves, 50% of which could be as deposits with central reserve city banks in New York (Champ 2011). The remaining reserves took the form of short-term securities issued by the Treasury and Greenbacks. Deposits at reserve city banks were not a perfect substitute for actual reserves, as reserve city banks could suspend payments in case of a crisis.

Finally, the OCC prohibited national banks from making excessively risky loans. In particular, national banks could not make loans on the collateral of real estate or bank stock, although they could take these assets as additional security for existing debt. They

[11] $50,000 for places with less than 6,000 inhabitants, $100,000 for cities between 6,000 and 50,000 inhabitants, and $200,000 for cities larger than that. National Banking Act, 1864, Sect. 7.

[12] National Banking Act, 1864, Sect. 13, 15, 33, 38.

were also prohibited from making accommodation loans to a single individual exceeding 10% of the bank's paid-in capital.[13] Bank loans were typically short term, but accommodation loans to individuals were frequently rolled over (James 1978, Lamoreaux 1994, p. 68-9).

1.3 Enforcement

In order to enforce these regulations, a bank examiner would make a (supposedly) unannounced visit to check the bank's books once a year (Robertson 1995, White 2016). If the examiner encountered a violation of the banking law, he would ask the Comptroller to issue an official warning, demanding that the bank remedy the problem as quickly as possible. The only sanction available to the OCC was to revoke a bank charter, but this option was seldom exercised. The OCC could start legal proceedings against bank officers, but these usually involved cases of outright fraud, rather than violations of the banking regulations.

Anecdotally, it appears that bank managers could hide information from examiners if they wanted to. In particular, loans could be mischaracterized. Loans collateralized with real estate or accommodation loans exceeding 10% of capital sometimes stood in the books as "safe" commercial paper. Frequently, such instances of creative bookkeeping only came to light after the Panic of 1873, when banks came under closer scrutiny of both depositors and examiners. For example, three national banks in Providence, Rhode Island lent large sums to the textile manufacturer A. & W. Sprague (all three bank presidents involved were married after the passage of a married women property act). These loans were grossly in excess of the 10% limit, but were supposedly backed by good commercial paper and did not formally violate the law. After the Panic of 1873, A. & W. Sprague went bankrupt, and it turned out that these loans were in fact based on accommodation paper, secured with real estate, violating banking regulation on both counts. No legal proceedings were started; however, the bank presidents were replaced.[14]

[13]Loans backed by commercial paper did not face this restriction. National Banking Act, 1864, Sect. 8, 28, 29 and 35

[14]National Archives, Records of the OCC (RG 101), Bank examiners' reports, 1864-1901, Boxes 12, 69

Banks also had some discretion in how to characterize loans in arrears. By law, if a loan had been in arrears for more than six months it had to be classified as "bad debt,"put into collection, and written down immediately, unless it was well secured.[15] What constituted "well secured" was up for interpretation and banks could roll over or evergreen bad loans for years so they would not have to cut dividends.

In extreme cases, bank managers could mislead examiners altogether and falsify the books. For example, in 1877 the examiner of the Farmers' & Mechanics' National Bank in Hartford noted that "the affairs of the bank are conducted with excellent system and the highest integrity, and in compliance with the law."A year later, however, the bank realized a loss of 30% of its capital that the bank president, J.C. Tracy, had actively hidden by falsifying the books. In this instance, the OCC did start legal proceedings.[16]

1.4 Double liability

There was no deposit insurance. The OCC tried to ensure the stability of the system by imposing double liability on stock owners (Mitchener and Jaremski 2015, White 2016). If a bank became insolvent, the OCC would take the bank into receivership and liquidate its assets on behalf of depositors and other creditors. If there was a deficit, the OCC could seize additional assets from a shareholder, up to the amount of capital paid-in, in proportion to its stock position.[17]

The OCC strictly enforced shareholders' double liability and actively pursued stockholders in case of bank failure.[18] The Supreme Court confirmed this authority in 1868 (75 U.S. 498). This levy was hard to escape: if shareholders who knew a bank to be insolvent had transferred their shares to someone else, this transaction was considered void (1 Hughes 158). The OCC also tried to keep track of bank shareholders' wealth. For example, in case of the

and 152.

[15]National Banking Act, 1864, Sect. 38.

[16]National Archives, Records of the OCC (RG 101), Bank examiners' reports, 1864-1901, Box 179.

[17]National Banking Act, 1864, Sect. 7, 9, 12, 16, 21

[18]National Banking Act, 1864, 50. Ball (1881, p. 258-264) gives an overview of the exact legal procedure.

Caledonia National Bank in Danville, an examiner noted that "no one is embarrassed or worth less than 3 times the par value of his stock."[19] Between 1870 and 1879 the OCC made total assessments of $6.8 million, of which 41% was eventually collected (Macey and Miller 1992). In some cases, shareholders themselves were insolvent; in other cases, they "could not be come at" for collection (OCC Annual report 1880, p. LXXIX).

1.5 Bank governance

The OCC mandated a particular governance structure. Each bank had a board of directors that was elected by the shareholders in an annual meeting. There had to be at least five directors who appointed a president from their own ranks. The president received a flat nominal salary for his efforts; he received no options, bonuses, etc. Day-to-day operations were supervised by the cashier. Formally, each director (including the president) had to own at least 10 shares in the bank (each with a par value of $100) – this would amount to a stake of 2% in a bank with $50,000 paid-in capital.[20]

The *de facto* governance structure, at least in New England, was somewhat different. New England was one of the most industrialized areas in the country, and, starting in the early 19th century, there was significant demand for outside capital from manufacturers.[21] Factory owners and their economic allies set up banks to raise money in the form of deposits that could then be invested into their businesses in the form of accommodation loans. Lamoreaux (1994) refers to this as "insider lending." Hilt (2015) confirms that this persisted into the 1870s.

This gave rise to a particular ownership structure. Banks were typically closely held by local insiders. Frequently, the bank president was the most prominent of these insiders, and held sufficient shares to control the bank. For example, the examiner of the Biddeford

[19]National Archives, Records of the OCC (RG 101), Bank examiners' reports, 1864-1901, Box 211.

[20]National Banking Act, 1864, Sect. 8, 9. The par value of a share corresponded to the underlying paid-in capital.

[21]In 1860 (1880), manufacturing in New England accounted for 28.0% (16.3%) of total U.S. production, whereas only 10.0% (8.1%) of the population lived in this part of the country (Niemi 1974).

National Bank noted that "the President of the bank controls the business (...); his word is law."[22] We have detailed information about president shareholdings for a subset of banks. For this subset, the average (median) percentage of bank shares owned by the bank president was 20 (12)% (details are in Online Appendix C).

Apart from control, these shareholdings also gave bank presidents skin-in-the-game with respect to outside shareholders. There was always a concern that bank presidents would mismanage the bank to the detriment of other shareholders.[23] Formally, the board of directors was supposed to actively monitor the bank's management. However, in practice, the other directors delegated most decision making to the bank president, and they only sporadically attended board meetings. Examiner reports are filled with complaints about this state of affairs. For example, the president of the Brandon National Bank "rules this bank with an iron hand, refusing information to stock holders, his board of directors a myth, almost dummies," while the president of the National Bank of Commerce in Boston "controls the board by reason of their blind faith in him and his reputed wealth."[24] Lamoreaux (1994, p. 107-8) indicates that this lack of oversight "opened the door to opportunistic behavior on part of the bank's active managers." The failure of the National Bank of Brattleboro in 1880 is a good example. The OCC appointed receiver noted that the president, Silas M. Waite, had managed the bank "for personal ends" and that bank failures would continue to happen "until stockholders are more vigilant in looking after their interests, by electing directors representing, not one or more officers, but the shareowners of the institution."[25]

1.6 The Depression of 1873-1878

After the Civil War the U.S. economy was booming, with real industrial production increasing by 46% (Davis 2004). Part of this growth was related to the expansion of the railroad

[22]National Archives, Records of the OCC (RG 101), Bank examiners' reports, 1864-1901, Box 211

[23]Unlike depositors, outside shareholders faced no additional protection from the OCC. Double liability would only hurt them in case of bank failure, and the OCC typically only got involved after serious problems had already emerged.

[24]National Archives, Records of the OCC (RG 101), Bank examiners' reports, 1864-1901, Boxes 47, 68.

[25]National Archives, Records of the OCC (RG 101), Bank examiners' reports, 1864-1901, Box 55.

network in the West, fueled by credit from East Coast money centers. When the boom ended, a number of financial institutions suspended due to defaults and the failed placement of railroad securities. This led to a nationwide financial crisis, centered in New York. The stock market fell 25% in a week and closed for a period of 10 days (Sprague 1910; Mixon 2008). This initiated a protracted Depression that would last until 1878.

In nominal terms, industrial production fell by 34.7% between 1873 and 1878.[26] This had an important impact on the New England manufacturers who had extensively used credit to fund their post-Civil War expansion (Hilt 2015). The dollar value of production was insufficient to service their debts, and the number of bad loans on National Banks' balance sheets increased significantly. Between 1876 and 1878, the National Banks in New England had to write down 12.5% of 1873 outstanding loans.[27] This masks significant heterogeneity across banks. For example, three large national banks in Rhode Island had to write down around 80% of their loan portfolio in the aftermath of the bankruptcy of textile manufacturer A. & W. Sprague.[28]

1.7 The introduction of Married Women's Property Acts

Double liability meant that, as large shareholders, bank presidents had significant exposure to downside risk.[29] General downside protection during this period was limited or hard to obtain. In this environment, the introduction of MWPAs had a first order impact on households' finances. Until the 1840s, marriages had been governed by traditional common law, which stipulated that, upon marriage, husband and wife were legally one. A husband took ownership of the personal (movable) property his wife brought into the marriage. The real estate she owned remained her separate property, but her husband had the right to the associated revenues. Creditors could lay claim to the wife's personal property and income

[26] See Davis (2004). The detailed figures are in Appendix A, Figure A.1.

[27] Annual Report of the OCC, 1873, 1876-1878.

[28] National Archives, Records of the OCC (RG 101), Bank examiners' reports, 1864-1901, Boxes 12, 69 and 152.

[29] Details and additional sources supporting this section are in Online Appendix B.

flows derived from her real estate as payment for the husband's debts. A couple had the option to sign a prenuptial agreement protecting the wife's property from such claims. In New England, however, there was considerable uncertainty as to whether prenuptial agreements would be enforced in court. As a result, prenuptial agreements seem to have been seldom used (Warbasse 1987, p. 7-9, 188; Salmon 1986, p. 120).

Starting in the 1840s, states in New England passed laws amending the common law so that, for all new marriages, the wife's property (either acquired before or after marriage) would be protected from creditors, irrespective of whether there was a prenuptial agreement (Salmon 1986, p. 139-40; Warbasse 1987, p. 188). All states in New England had passed a MWPA by 1862. Table 1 gives an overview of the laws that we use in the paper.

Under traditional common law, the husband was the sole manager of the household's assets and the wife lacked the legal capacity to contract. The passage of the MWPAs that we consider in this paper largely kept this part of the law in place. With the exception of Massachusetts, women's ability to contract independently was only accomplished by later legal changes. Women did obtain more influence over the management of their property, with the laws stipulating that they had to formally agree to certain transactions. The acts did not change the law on divorce, which remained rare.

Legislators realized that husbands might try to use the MWPAs as a way to defraud creditors by transferring assets to their wives. In an attempt to prevent this, the laws explicitly stated that the protection afforded by the MWPAs did not extend to transfers from the husband.

The new legislation did not apply retroactively, in observance of the contracts clause of the U.S. Constitution, stipulating that states cannot pass laws that impair existing contracts. The case law confirms that the courts consistently enforced the laws; creditors were successfully barred from taking a wife's property in satisfaction of her husband's debts, but only if the couple was married after a MWPA.

In sum, the introduction of MWPAs generated a relatively clean break in the legal treat-

ment of marital property. Before, the enforcement of prenuptial agreements was uncertain – this was one of the key reasons for introducing the laws in the first place – and few couples seem to have had them. After, a wife's property was protected from her husband's creditors by default, regardless of whether or not there was a prenuptial agreement. Given the lack of general downside protection in this period, this substantially limited bank presidents' liability.

1.8 Examples

The example of Elijah C. Drew illustrates the mechanism we have in mind.[30] In 1872, Drew started the Eleventh Ward Bank in Boston, owning 451 of the bank's 3000 shares, amounting to about $45,000. He had married Hannah H. Haynes in 1855 (post-MWPA), after the death of his first wife in 1854. Hannah Haynes was the only surviving child of Charles Haynes, and the sole heir to his estate of $250,000, which she inherited in 1873. In the words of the bank examiner, "Mrs Drew is rich in her own right by her father of unencumbered property."Originally a lumber merchant from Maine, Drew himself was of more modest means. According to the bank examiner, "Drew is called a rich man but [his assets] are in real estate and in general terms I hear it is mortgaged."[31]

From the get-go, Drew managed his bank in a risky fashion. The bank examiner complained incessantly of creative bookkeeping and low cash reserves. In 1874, he feared that Drew was deceiving the OCC with regards to a sizeable loan to an H.M. Bearce that amounted to more than 10% of paid-in capital: "I fail to be convinced that they are bona fide bills of exchange drawn against existing values of commercial or business paper actually owned by the person negotiating the same." Later, it turned out that these loans, rather than safe commercial paper, were backed with speculative real estate investments in Houston, Texas. A year later, numerous mortgages showed up on the balance sheet, which were

[30]This and next paragraphs are based on material found in National Archives, Records of the OCC (RG 101), Bank examiners' reports, 1864-1901, Box 255.

[31]This refers to an upscale apartment building in a new neighborhood in Boston, called the "Commonwealth Hotel", which Drew borrowed heavily to build.

taken to secure existing loans that had gone bad. Other loans were in arrears. The examiner advised not to pay out any dividends "in the consequence of so much doubtful paper," but Drew ignored him. In 1876, the examiner reported that Drew was taking on additional leverage and risk. The bank added its endorsement to risky loans and re-sold them at a lower interest rate. This allowed the bank to make a spread, but also exposed it to tail risk. In January 1877, the examiner reported that Drew had made loans to obscure borrowers "not rated by the agencies."The examiner also complained that Drew was slow in realizing losses: "New notes take up old ones, and keep the debt alive. The president says payments come hard, and people threaten if pressed, they will fail."

At that point, the Eleventh Ward bank was on the brink of failure. At the end of January 1877, H.M. Bearce defaulted, which triggered a run on the bank. The board of directors stepped down. The examiner assumed management and tried to save the bank, but ultimately put the bank into liquidation. A year later, the examiner reported that "no-one anticipated the very hard times that followed, the assets have shrunk beyond anything in my experience, firms have petered out, mortgages, equities etc. have gone out of sight."Most loans were worthless. In the liquidation, the OCC had a large claim against Drew of $140,000. This not only originated from the double liability on his shares, but also from the fact that Drew himself had endorsed many loans made by the bank and was on the hook for their repayment. The OCC failed to realize anything on this amount. Drew's main asset, the Commonwealth hotel, was appraised at a value of $266,000 with liabilities amounting to $380,000, which mainly consisted of mortgages with a senior claim on the hotel. Mrs. Drew initially promised to support the bank "to save Drew's good name,"but reneged on that promise after the full extent of the bank's losses became apparent. Rather than providing support, she claimed ownership over some of Drew's remaining assets the examiner had hoped he could sell for the benefit of depositors.

The example of the Amoskeag National Bank in New Hampshire shows why depositors might have been willing to play along. Moody Currier, the president of the bank, lost his

wife in 1869 and immediately remarried Hannah Slade, the daughter of a prominent family. The marriage took place after the passage of a MWPA. Currier immediately decided to lever up his bank, increasing interest rates on deposits to 6%. From 1869 to 1873 the bank's ratio of loans and securities over capital increased from 1.38 to 2.25. The bank got into trouble after the Panic of 1873. In 1876, the bank reported a large amount of bad debts, amounting to 21% of 1873 capital, and depositors started withdrawing their money, leading to a fall in deposits from $440,000 to $280,000.[32] Later, the bank's stockholders sued Moody Currier and the board of directors for illegal conduct in a case that would finally end up in the U.S. Supreme Court (134 U.S. 527).

Naturally, additional risk taking did not always lead to bad outcomes. The president of the First National Bank of Litchfield in Connecticut, Edwin McNeil, had married in 1856, after the passage of a MWPA. The bank predominantly lent to a local railroad. In 1873, the bank examiner complained that this violated regulation. During the Panic and subsequent depression, the bank got lucky; the railroad performed well. McNeil was able to sustain a relatively high dividend, allowing him to cash in on the 750 (out of 2000) shares he owned in the bank.[33]

2 Model

In this section, we sketch a simple model to highlight the main economic intuition behind our results. Appendix D contains proofs and some additional detail.

A bank funds a certain amount of assets with equity e and deposits d. Equity has double liability. We abstract from any agency conflicts between the bank president and other shareholders, and we assume that the bank president owns all equity e.[34] The banker is risk averse with log utility.[35] He lacks commitment. Fraction α of his household wealth,

[32]National Archives, Records of the OCC (RG 101), Bank examiners' reports, 1864-1901, Box 71.
[33]National Archives, Records of the OCC (RG 101), Bank examiners' reports, 1864-1901, Box 91.
[34]We discuss an extension of the model in which bankers can issue outside equity in Appendix D.
[35]Our results hold under certain less restrictive assumptions about the banker's utility function. See

W, is held in the wife's name and is protected from any outside claims, provided it has not been invested in the bank. For bankers married before a MWPA, $\alpha = 0$.

The bank operates locally and can issue at most $\overline{D}$ in deposits. Depositors are atomistic and risk neutral. If deposits can be repaid in the bad state, they are risk-free; otherwise, they are risky. Under risky deposits, depositors demand interest payments in the good state, which compensate for this risk.[36] Bankers are constrained to invest at least κ of their own wealth in the bank. We assume that $(1-\alpha)W > \kappa$, so the banker can always meet the minimum capital requirement.

The banker can invest in one of two risky projects, $j \in \{1, 2\}$, that have the same expected return, μ. There are two states of the world, and each risky project pays out $R \in \{\mu - \sigma_j, \mu + \sigma_j\}$ with equal probability. Project $j = 2$ is riskier than $j = 1$; that is, $\sigma_2 > \sigma_1$. We assume that risk-adjusted expected returns are positive.[37] For simplicity, we assume the risk-free rate is zero.

Bankers make three key choices: (1) how much capital to invest in the bank (over and above κ), (2) whether to issue a limited amount of risk-free deposits or a large amount of risky deposits, (3) which project to invest in.

Proposition 1 *Suppose that $\overline{D}/\kappa \in (\phi, \chi)$, and $(1-\alpha)W > \kappa$, and $W < \lambda\overline{D}$. A banker will choose to issue risk-free deposits and invest in project $j = 1$ if $\alpha < \alpha^*(W)$. He will issue risky deposits and invest in project $j = 2$ if $\alpha > \alpha^*(W)$.*

Consider a banker married before a MWPA ($\alpha = 0$). The banker faces a trade-off between issuing deposits and investing his own wealth in the bank, over and above κ. Issuing deposits is attractive, since the banker can invest them in an asset that pays positive risk-adjusted returns. However, issuing too many deposits will cause the bank to fail in the bad state and trigger double liability claims. Investing his own wealth is attractive, as this also earns high

Appendix D for details.

[36] In the absence of a (corporate) income tax in the 19th century, there were no tax benefits to debt, so this does not factor into our analysis.

[37] That is, in autarky, the banker prefers to invest in the risky project rather than in the risk-free asset.

returns. However, it raises potential double liability payments if the bank fails. As such, a risk-averse banker has two plausible courses of action: (1) He can invest all his wealth in the bank ($e = W$) and issue a limited number of risk-free deposits; (2) He can invest the minimum amount in the bank ($e = \kappa$) and issue a large number of risky deposits. We focus on case (1), which prevails if $\overline{D}/\kappa$ is not too large, so the upside from option (2) is limited. As noted in section 1.2, banks' minimum capital requirement κ increased with town size, which roughly reflects $\overline{D}$ (as deposits were issued locally). Therefore, we essentially assume that regulators set $\overline{D}/\kappa$ low enough so that double liability had "bite" and steered bankers towards the less risky option (1). Because the banker is risk averse, he will choose the less risky project ($j = 1$).

Now, consider a banker married after a MWPA ($\alpha > 0$). This banker can benefit from investing heavily in the bank *and* issuing a large number of deposits simultaneously. He can invest up to $e = (1 - \alpha)W$ in the bank and issue risky deposits, and he will be left with at least αW in the bad state. Given that the banker is risk averse, this is only optimal if α is sufficiently large. If the banker chooses risky deposits, he will invest all of his wealth in the bank; this earns him a positive return in the good state, and reduces his double liability payment in the bad state to zero. Because consumption in the bad state is not contingent on the return on the investment project, and the banker lacks commitment, he will invest in the riskier project ($j = 2$).

The proposition puts a lower bound on $\overline{D}/\kappa$ and an upper bound on W. Both ensure that risky deposits are ever optimal. If κ is too large relative to the size of the depositor base, the return on bank capital in the bad state will always be sufficient to make depositors whole. If the banker is too wealthy relative to the depositor base, the upside from risky deposits is insufficient to compensate for the loss of his own capital in the bad state, so the banker will choose risk-free deposits irrespective of α.

Lemma 2 *Bankers married after the passage of a MWPA are (weakly) more likely to (a) have higher leverage and (b) choose the riskier project $j = 2$ than bankers married before.*

For bankers with sufficiently wealthy wives, the introduction of an MWPA constitutes a shift from $\alpha = 0$ to $\alpha > \alpha^*$. When $\alpha = 0$, the banker invests all of his household's wealth in the bank. When $\alpha > \alpha^*$, the banker only invests a fraction of his household's wealth, and issues more deposits; this constitutes higher leverage.

Lemma 3 *The impact of a MWPA on total investment $e + d$ is ambiguous.*

This follows from the fact that deposits and equity move in opposite directions.

In sum, we expect that banks with presidents married after the introduction of a new marriage law are (1) more highly levered, (2) make riskier investments and (3) suffer larger losses in bad states of the world, and that these effects are more pronounced for bankers with richer wives.

3 Data description

3.1 Sources

Data on banks' balance sheets and their performance come from two sources. First, we use the annual (printed) reports from the Office of the Comptroller of the Currency (OCC). These data provide a snapshot of the banks' balance sheets on practically the same day each year (usually in early October). The reported data contain the bank's most important balance sheet items, but lack detailed information on the banks' loan book and specific asset holdings. In addition, there is no information about profits and losses. We entered the data from 1867 (the first year with information on the identity of the bank president) to 1880. The 1873 report was made right before the onset of the Panic of 1873 and we take this as the final pre-crisis year.

Second, we use information from (handwritten) bank examiner reports, held by the National Archives. These reports give information about the amount of loans in arrears and detail whether such loans were put in collection and written down, or whether they were kept

alive and rolled over. There is also information about the amount lent to the president and directors, the amount of loans backed by real estate, and accommodation loans exceeding 10% of paid-in capital. The reports classify loans being guaranteed by just one or multiple individuals. Closer inspection of the reports indicate, however, that examiners were often unsure about the classification and that banks could easily misreport, with the exact character of a loan only becoming clear after a bank got into trouble. Finally, the examiner reports give information about dividends, capital calls, rights issues and the winding down of failed banks. Together with information on changes in paid-in capital and retained earnings, this allows for a reconstruction of a bank's profits and losses. We collected information from the examiner reports between 1870 and 1880. Reports generally lack detailed information before 1870; we stop in 1880, as the Long Depression had dissipated by then. Form templates differ over time and individual examiners could differ in their degree of precision when filling out the forms; we include form-type and examiner fixed effects when appropriate.

Third, we locate bank presidents in marriage records and the census. We do this manually, using Ancestry.com and Familysearch.org. Marriage records allow us to determine whether presidents were married before or after the passage of a MWPA. We use the 1870 census to determine their age and the value of movable ("personal") assets and real estate they owned (both self-reported). Asset values generally refer to the household as a whole. We are able to find this information for 546 of all 687 Bank Presidents active between 1867 and 1873. This determines the scope of the final sample that we use. There are a total of 507 banks active in New England between 1867 and 1873. In 374 cases, the banker's personal information is available for each and every year. This number is higher when we consider individual years. For example, of all 494 New England banks active in 1873, there is complete information in 413 cases.

Fourth, we use the complete count 1850 census (Ruggles et al 2015) to construct measures of familial assets for bank presidents and their spouses. The 1850 census is the earliest census that provides asset information, although this is restricted to real estate. We calculate the

average real estate reported by families with the same last (maiden) name and in the same state of birth as the bank president and his spouse. This serves as a proxy for the relative quantity of assets husbands and wives brought into the marriage (Koudijs and Salisbury 2016). We evaluate the accuracy of this measure of familial assets in Appendix A. Figure A.2 plots total household assets reported in the 1870 census against the sum of husband's and wife's familial assets constructed from the 1850 census (both in logs). There is a strong correlation between the two.

3.2 Variables

For the pre-crisis period, we construct variables that measure a bank's risk taking on both the liability and asset side.

To capture banks' leverage, we use the OCC reports to calculate the ratio of loans and securities to capital. Loans include all loans and discounts made by the bank. Securities mainly consist of railroad bonds and exclude the government bonds that backed the issuance of banknotes. We decompose the ratio of loans and securities to capital into two parts: the ratio of deposits to capital and the ratio of reserves to deposits. The former captures the amount of borrowing a bank undertakes relative to its capital; the latter indicates how much of that borrowing is kept in the form of reserves rather than loans or securities. Reserves include legal tender (greenbacks and short-term government debt) and specie. For some bank-years, deposits are quite small and the latter ratio is not well defined. To remedy this, we winsorize the ratio of reserves to deposits at the 2.5th and 97.5th percentile.

To capture risk-taking on the asset side, we focus on the loans in arrears reported in the examiner reports. The bank examiner classified these loans into two categories: loans that were in collection and written down, and loans that were kept alive and rolled over. If a loan was written down, this reduced the dividend a bank could pay. We consider this less risky than rolling over the loan, delaying collection, and risking larger losses in the future (see the

example of Elijah C. Drew). We lack other measures of asset risk.[38]

For the crisis period, we construct a number of outcome variables.

First, based on the examiner reports, we construct measures of loans that were made contrary to law; that is, individual loans exceeding 10% of paid-in capital, or loans collateralized with real estate. If these loans did show up on a bank's balance sheet after 1873, it meant that the exact character of the loan had initially been misrepresented, or, in case of real estate, that a loan had not performed well, leading the bank to take additional security. Often, these loans only appeared on a bank's balance sheet after the examiner had discovered them and forced the bank to quickly dispose of them. Thus, we take the maximum of such loans per bank between 1873 and 1880. We normalize by total loans outstanding in 1873.

Second, we construct direct measures of bank performance. We measure banks' cumulative profits or losses between 1873 and some end year as a percentage of 1873 capital. We assume that loans in arrears reported in the end year are worth \$0. We also construct the log-change in deposits and loans between 1873 and some end year. In the absence of deposit insurance or bailouts, it is likely that the institutions that perform the worst lose the most deposits. Finally, we calculate the change in loans outstanding, which captures the potential negative effects of risk-taking on the real economy.

Our main explanatory variable is a "protection" dummy that has a value of 1 if a banker was married after the passage of a MWPA. We count unmarried bankers as unprotected. There is ambiguity as to whether the law in the state of marriage or the state of residence applied. The two largest states in our sample, Connecticut and Massachusetts, appear to have used the state of marriage.[39] We follow this definition in the main text. We replicate our main results, restricting the sample to bankers for whom the protection dummy would be

[38] As said, bank examiners' classification of loans being guaranteed by just one or multiple individuals appears imprecise. It is not clear whether lending to the president and other directors was especially risky. Lamoreaux (1994) argues that these loans did not suffer from the same informational asymmetries as regular loans and could have been relatively safe. At the same time, there is evidence that, in certain cases, insiders did abuse their powers to obtain funding for questionable projects (Meissner 2005).

[39] New Hampshire seems to have used the state of residence. For Maine, Rhode Island, and Vermont, we found no evidence in favor of either option. Appendix B has details.

same using either the state of marriage or state of residence. Results are virtually unchanged. If we use the state of residence, all results are qualitatively similar.

3.3 Summary statistics – Banks

Table 2 reports summary statistics for the most important bank variables. Of the 3,452 bank-year observations covering 1867–1873, information on the banker's marital status is available in 2,810 cases. The table shows that the restricted (linked) sample is broadly representative of the sample as a whole. Banks have similar size and geographical distribution over the six New England states. The same holds for all variables that capture risk-taking.

At least by modern standards, the leverage ratio of an average national bank appears low. In 1873, the average assets-to-capital ratio was 2.1 (75th percentile at 2.25). Assets include reserves and bonds backing the issuance of banknotes. The ratio of loans and securities to capital, our preferred measure of leverage, was 1.34 (75th percentile at 1.47). This is driven by two factors. First, the economic environment of the 1870s was much more volatile than today, exposing the banks to large potential losses in economic downturns (Wicker 2000). The historical overview in Section 1 indicates that individual banks' losses could be substantial, up to 80% or 90% in specific cases. Second, many shareholders had large personal debts with the bank that were effectively collateralized with bank stock. This means that the true leverage of the banks was likely higher. For example, if we deduct all loans to presidents and directors from both total loans and capital, the average ratio of loans and securities to capital increases to 1.42. This ignores other shareholders who were not on the board of directors but who still obtained large loans from the bank.

3.4 Summary statistics – Bankers

Table 3 reports summary statistics for the personal characteristics of the bank presidents in our sample, separated by protection status. We first illustrate where the variation in protection status comes from. The table shows that, unsurprisingly, the average year in

which a state passed a MWPA was later for bankers married after a law (1849 vs 1854). Bankers married after were typically younger (51 vs 61) and their age at current marriage was higher (39 vs 29). The latter is largely driven by remarriages after the death of an earlier spouse: around 45% of bankers married after a MWPA were remarried, versus 11% of bankers married before. The average age at first marriage differs much less (28 vs 27).

In other dimensions, bankers married before and after a MWPA look similar. They report roughly the same household assets in the 1870 census, although bankers married after appear slightly less well off ($102k vs $123k). This suggests that, if anything, wealth differences should make bankers married after a MWPA more risk averse. The log-difference between wife's and husband's familial assets is roughly the same, although bankers married after appear to have somewhat richer wives (-0.08 vs -0.21). Finally, the age of their bank is broadly similar (31 vs 32 years). This suggests that bankers married after a MWPA did not typically manage less well established, and potentially riskier banks. None of these differences are statistically significant. For completeness, Figure A.3 in Appendix A presents the distributions of these three variables for bankers married before or after a MWPA.

Comprehensive data on bankers' shareholdings is not available, except for a subset of about 100 bankers. For this subset, the average (median) banker held 20% (12%) of the shares in his bank. In Appendix C, we further analyze this data to determine whether double liability claims could plausibly dip into the wife's separate estate. From the 1870 census, we have information about the total value of assets owned by the household. No adjustment was made for any debts outstanding and, therefore, this provides an upper bound on what was available in case of bank failure. Moreover, the value of household assets was typically not invested in risk-free assets and could depreciate heavily in states of the world in which the bank might fail. We relate this value of household assets to the value of a banker's shares in 1870 plus the potential double liability claim. If we assume that a banker's wife's separate estate comprised half of the household's assets, double liability claims would endanger their

estate in 55% of cases.[40]

4 Empirical approach and results

In this section, we present the empirical approach and results. First, we study whether banks with managers married after the passage of a MWPA took more risk between 1867 and 1873, both in terms of bank leverage and the propensity to realize losses. Second, we examine whether these banks performed worse during the Depression of 1873-1878. We also study whether effects are stronger for bankers who, relative to themselves, had richer wives. Finally, we investigate whether limiting bankers' liability through a MWPA led to the increased use of steam power by local companies.

4.1 Ex ante risk taking

4.1.1 Leverage

How did the MWPAs affect bankers' risk taking in the years leading up to the Panic of 1873? In Table 4, we explore whether banks managed by presidents married after the passage of a law took on more leverage. We estimate the following regression:

$$Y_{i,t} = aP_{i,t} + bX_i + \tau_t + \psi_i + \varepsilon_{i,t} \tag{1}$$

where i indexes banks and t indexes years. There are three outcome variables: (i) the ratio of loans and securities to capital (leverage); (ii) the ratio of deposits to capital; and (iii) the ratio of reserves to deposits. $P_{i,t}$ is a dummy which has a value of 1 if, in year t, bank i has a president married after a MWPA. We use annual bank level-data from the OCC annual reports between 1867 and 1873. We always include year fixed effects τ_t and cluster standard

[40] We can refine this calculation using information about husband's and wife's familial assets. If we assume that women's separate estate was proportional to their share in total familial assets, double liability claims would endanger their estate in 50% of cases.

errors at the bank level. X_i includes a dummy for Boston, as banks located here had a higher reserve requirement, and dummies for the three town population bins (<6,000, 6,000 – 50,000, >50,000) that determined the minimum amount of paid-in capital.

In column 1, ψ_i includes state-by-year fixed effects. In this specification, a protected banker increases the ratio of loans and securities to capital by 9.6 percentage points. This is roughly equivalent to moving from the 50th to 66th percentile (conditional on all fixed effects and control variables). The effect is primarily driven by an increase in the ratio of deposits to capital. The ratio of reserves to deposits declines somewhat, but this is not statistically significant. In columns 2-5, we gradually introduce additional fixed effects, including county-by-year, age, and age at first marriage. The age variables are collapsed into five year bins. The effect of protection on leverage remains roughly similar throughout. Controlling for age reduces the coefficient somewhat, suggesting that younger bankers took more risk. Controlling for age at first marriage strengthens the results somewhat, suggesting that bankers who waited longer to get married took less risk.

Columns 6 uses an alternative specification with bank fixed effects. This is identified from the 142 instances of turnover that occurred between 1867 and 1873, and, therefore, has limited statistical power. Nevertheless, we still find an effect on leverage, although it is smaller and statistically less significant than in the other columns.

The results in Table 4 suggest that bank presidents married after a MWPA chose to lever their banks up more than bank presidents married before. In Figure 1, we test whether this effect is stronger for bank presidents with wealthier wives. The vertical axis has the ratio of loans and securities to capital. The horizontal axis has the log-difference between husband's and wife's familial assets. Both variables are residualized using the specification of Table 4, Column 2, adding back the mean. We use local mean smoothing to calculate kernel-weighted means at the 5th, 10th, ..., 95th percentile of the distribution of the log-difference in familial assets.[41] We do this separately for bank presidents married before and after the passage of

[41] We use Stata's lpoly command with an automated "rule-of-thumb" bandwidth and a standard Epanechnikov kernel. Smoothing with higher order polynomials yields qualitatively similar results.

a MWPA. The figure confirms that the effect of protection on leverage is the strongest for bank presidents married to richer wives. Figure A.4 in Appendix A presents the same figure using the specification of Table 4, Column 5. The inclusion of additional fixed effects reduces statistical power, but the results are qualitatively similar.

Table A.1 in Appendix A replicates Table 4 (excluding the specification with bank effects) using a different definition of the protection dummy. For this table, the protection dummy has a value of 1 if a bank's president was married after the passage of a MWPA during all previous $min\{t-1867, 5\}$ years and 0 otherwise. This is meant to capture the fact that it may take time for a bank president to change the policies of a bank. Table A.2 excludes bankers who were unmarried. Table A.3 restricts the sample to bankers who live in their state of marriage. The results remain virtually unchanged under these alternative specifications.

4.1.2 Realizing losses

In Table 5, we test whether protected bank presidents were less likely to write down loans and realize losses. Data come from the 1870-73 examiner reports. Specifications are broadly the same as in Table 4, but we add bank examiner and form-type fixed effects. In the first panel, we test whether protected bankers reported a higher fraction of loans in arrears. This is not the case. In the second panel we restrict the analysis to loans in arrears that are written down. Results confirm that protected bankers were less likely to write down loans. The point estimate in Column 2 roughly corresponds to moving from the 50th to the 20th percentile in the conditional distribution. The effect is statistically significant at the 10% level. As we add fixed effects, this effect remains roughly the same and statistically significant, except in the specification with bank fixed effects. That is not surprising, as there are only 57 changes in bank presidency between 1870 and 1873. In the third panel, we control for the overall fraction of loans in arrears. Economically, the effects are similar while the precision of the estimates improves. Since 80% of bank-year observations do not feature any loans that are written down, we lack the statistical power to test whether the effect is strongest for bank

presidents with richer wives.

4.2 Ex post performance

How did banker protection affect performance during the Panic of 1873 and the ensuing Depression? We restrict our sample to banks that were present in the sample in 1873. For each bank, we determine whether its 1873 president was married before or after the passage of a MWPA. We then investigate whether banks that had a president married after the introduction of a law fared worse. In particular, we estimate the following regression

$$Y_i = aP_{i,1873} + bX_i + \psi_i + \eta_i \tag{2}$$

for bank i, where X_i includes the same controls as before and ψ_i includes a set of fixed effects.

The first set of outcome variables we consider are loans exceeding 10% of paid-in capital and mortgages. As said, both types of loans were contrary to law. If they showed up on a bank's balance sheet after 1873, this either signals that the bank had initially misrepresented the character of the loan, or, in case of mortgages, that the bank had been forced to take additional security after a loan turned sour. These loans typically only showed up once on a bank's balance sheet, at which point the bank tried to dispose of them quickly. Thus, for both variables, we take the maximum during 1874-1880. We normalize by the bank's total loans in 1873 .

Results are presented in Table 6. The fixed effects are the same as in Table 4, but exclude year fixed effects, as we now only have one observation per bank. There is evidence that protected bank presidents made more loans contrary to law. In the case of loans exceeding 10% of paid-in capital, the point estimate in Column 2 roughly corresponds to moving from the 50th to the 70th percentile in the conditional distribution. For mortgages, the point estimate roughly corresponds to moving from the 50th to the 82nd percentile. Since 60% or 35% of observations do not have any loans exceeding the limit or feature any mortgages,

respectively, we do not have sufficient statistical power to test whether the effect is strongest for bank presidents with richer wives.

The second set of outcome variables we consider are accumulated profits and losses between 1873 and some end year and the log-change in deposits and loans. We first present the results graphically in Figure 2, using a specification that includes county fixed effects and a dummy for Boston and three town population bins. In the figure, we vary the end year between 1874 and 1880. The first panel shows that, starting in 1877, protected bank presidents had to absorb additional losses to the tune of 5% of 1873 capital. Not incidentally, 1877 is the first year in which banks started in earnest to write down bad debts from capital. The second panel indicates that in the Panic of 1873, depositors seem to have singled out banks managed by bank presidents married after a MWPA. The additional decrease in deposits for these banks is around 7%. There is some recovery in 1875 and 1876, but in 1877 they face an excess drop in deposits of 13%. The third panel documents a similar pattern for loans outstanding. By the end of the decade, banks managed by bank presidents married after the passage of a MWPA saw loans decrease by an additional 8%. In other words, during the Long Depression after 1873, the MWPAs had significant real consequences.

In Table 7, we fix the end year at 1878 (the approximate end year of the Long Depression) and confirm that the effect we document in Figure 2 is robust to the inclusion of additional fixed effects. The point estimates in Column 2 roughly correspond to moving down in the conditional distribution from the 50th to the 33rd percentile for all three variables. Figure 3 shows that the effect is strongest for bank presidents with richer wives. The figure uses the same specification as Column 2 in Table 7.[42]

In Table 7, Column 6, we add 1873 leverage as a control variable. The change in the coefficient on the protection dummy is a rough indicator how much of its effect is driven by higher initial leverage.[43] The coefficient drops between 6% and 13%, depending on the

[42]Appendix A, Figure A.5 shows the same figure, using the same specification as Column 5 in Table 7.

[43]This specification suffers from a "bad control problem" as initial leverage is endogenous. These results should therefore be interpreted with caution.

outcome variable. This suggests that higher initial leverage contributed to the worse performance of banks managed by protected presidents, but that other factors, such as initial asset choice and response to the Panic, are also important contributors.

4.3 Impact on local firms

So far, we have shown that banks run by bankers married after a MWPA had more leverage, were more likely to violate lending rules, and performed worse after the Panic of 1873. This suggests that limiting bankers' liability indeed made banks riskier.

It is not obvious that this was a bad thing. Bankers married before the passing of a law may have been too conservative, foregoing investment in projects that, from a social point of view, had positive net present value. Limiting liability could therefore have led to more productive investment. In unreported results, we find no evidence that banks managed by bankers married after a MWPA were larger and extended more loans in dollar terms (suggesting they simply substituted capital for deposits). Nevertheless, they may have been more willing to lend to new and innovative (and therefore riskier) firms.

We explore the relationship between limited banker liability and investment using firm-level data from the 1870 Census of Manufacturers. The Census of Manufacturers was a survey of all establishments producing more than $500 in output (Atack and Bateman 1999). Surveyed firms were asked a series of questions about employment, wages, raw materials, motive power, and output, which are recorded in the census manuscripts. We use data from a sample of the surviving manuscripts (Bateman, Weiss and Atack 2006).

The firm-level outcome we analyze is the use of steam engines. Steam power proliferated in the United States, largely supplanting water power, during the second half of the 19th century. The adoption of steam power has been credited with increasing establishment size and labor productivity in American manufacturing (Atack, Bateman and Margo 2008). Importantly, the installation of a new steam engine amounted to a large up front capital expenditure, for which firms would have needed credit.

Our conjecture is that firms with easier access to credit should have been better able to adopt steam power. As bank credit was typically extended locally, we measure credit availability by the number of banks, weighted by size, in a firm's county in the years leading up to 1870.[44] We first test whether firms located in counties with more bank capital were more likely to adopt steam power; we then test whether this effect varies with the quantity of bank capital located in banks with a president married after a MWPA.

These results are presented in Table 8. In Column 1, we show that firms in counties where banks extended more loans in 1867-69 are more likely to use steam power in 1870. This is conditional on the number of manufacturing establishments, as well as a full set of state and industry fixed effects. Similarly, in Column 2, we show that firms located in counties with more bank capital in 1867-69 are more likely to use steam power in 1870. In Column 3, we add "protected" bank capital to the regression. This has virtually no impact on the coefficient on total bank capital, and is itself unrelated to the probability of adopting steam power. This tells us that the link between access to banks and the use of steam power does not depend on the liability of the bank president.

We include a very minimal set of controls in these regressions, and we are not able to identify the driver of the correlation between local bank capital and the adoption of steam power. For instance, we cannot separately identify this impact from the effect of urbanization on steam power; county-level bank capital and a county's urbanization rate are highly correlated ($\rho = 0.67$). What is important for our purposes is that the relationship between bank capital and steam power is invariant to the protection status of bank presidents. While this evidence is only suggestive, we see nothing to indicate that local firms were better able to invest in innovative new technologies if their local bankers had limited liability.

[44] In practice, we aggregate bank capital up to the county level during the years 1867-69.

5 Robustness – Selection

In this section, we perform three robustness exercises that deal with selection bias. First, we address the concern that riskier banks were more likely to hire managers married after a MWPA. If the passage of a MWPA had no impact on a banker's incentives, it is unclear why any such selection would take place. However, if the passage of a MWPA did give a banker the incentive to take more risk, this might lead protected bankers to self-select into riskier banks, which would bias our estimates of the causal effect of the MWPAs upward. To address this concern, we test whether a bank's balance sheet can predict whether a new bank president was married before or after the introduction of a MWPA. Second, we examine whether future bank managers manipulated the timing of their marriages in the 1840s and 1850s to select a certain marriage regime. Finally, we consider the possibility that, after the passage of a MWPA, different types of men became bank presidents. We present our main results explicitly controlling for husband's and wife's familial assets.

5.1 Selection of bankers into banks

In Appendix A, Table A.4, we investigate whether bankers whose wives' wealth was protected through a MWPA were selected into banks with particular characteristics. Out of all 178 changes in bank presidency between 1867 and 1873, the personal information of the incoming banker is available in 142 cases. Of these, 46 (32%) were married after a MWPA. We regress protection status on the size of the bank (captured by log total assets) and our measure of leverage, the ratio of loans and securities to capital. Both variables are converted to z-scores and lagged by one year to ensure that we do not pick up policies instituted by the new bank president. Table A.4 presents some evidence that larger and more levered banks tended to appoint bank presidents married after a MWPA. However, this effect is statistically insignificant and economically small. Increasing the size or leverage of the bank by one standard deviation increases the likelihood of appointing a protected bank president

by 4.6 and 6.6 percentage points, respectively. It is therefore unlikely that our estimates are inflated by bankers married after a MWPA selecting into riskier banks.

5.2 Selection of bankers into marriage regime

It is possible that future bankers with greater risk tolerance delayed their marriage until after the passage of a MWPA to benefit from greater protection. This would lead us to overestimate the effect of a MWPA on risk-taking. We evaluate this argument in Figures A.6 and A.7 in Appendix A. Figure A.6 plots the distribution of bank presidents' year of marriage in the sample, defined as years before or after the passage of a MWPA. The figure shows no evidence that bank presidents systematically postponed their marriage until after the passage of a law. However, if only "risk loving" men preferred to marry after a MWPA, they might have delayed marriage, while more risk averse men accelerated marriage. In this case, selection could still be an issue, even if we observe no spike in the distribution of marriage year. This would predict, though, that men married shortly before the passage of a MWPA would be unusually young, and men married shortly after would be unusually old. We test this in Figure A.7. Overall, bank presidents married after a MWPA tended to be older. However, there is no evidence that older marriages are clustered immediately after – or that younger marriages are clustered immediately before – the passage of a MWPA. Taken together, the evidence does not suggest that bankers timed their marriage to select into a particular protection regime.

5.3 Selection into banking profession

Table 2 provides some evidence that bankers married after a MWPA had richer wives, but that their total household wealth was somewhat lower (though neither relation is statistically significant). This suggests that the MWPAs may have allowed poorer men to "marry up" and become bankers. Such men might have had particular characteristics. On the one hand, they might have been more risk averse, afraid to undo their ascent up the social

ladder. On the other hand, they may have been more entrepreneurial and, thereby, more risk tolerant. To evaluate whether the latter could drive our results, we replicate the leverage results from Table 5, Column 5 controlling for household assets, husband's familial assets and the log difference between husband and wife's familial assets. To facilitate comparison, we restrict the sample in each column to observations where all these variables are available. Admittedly, these measures are noisy. So, we are not just interested in whether the effect of protection on risk taking survives the addition of these controls; we care about how much the coefficient changes. If it remains stable, this suggests that measurement error would have to be unreasonably high for these variables to explain our results.

Results are in Appendix A, Table A.5. Column 1 provides the baseline. This is equivalent to Table 5, Column 5, restricting the sample to observations for which all controls are available. In Columns 2 to 5 we include the additional controls. The coefficient on the protection dummy is literally unchanged. This suggests that our results are not driven by relatively poorer men (with systematically different unobservables) becoming bankers.

6 Conclusion

In this paper, we investigate whether limiting bankers' liability increases bank risk-taking. Our results confirm this: bankers married after the passage of a Married Women's Property Act (MWPA), whose wives' assets were protected from claims in the event of bank failure, took more risk than those married before the passage of a law, for whom all household assets were potentially on the line. Bankers with less liability took on more leverage, exposing their banks to negative shocks. They were also less likely to realize losses and more likely to make loans contrary to law, leading to lower loan quality. As a result, they lost more capital and deposits after the Panic of 1873, and were forced to cut back on lending.

These findings have important implications for today. Our results suggest that individual bankers' liability can importantly influence risk-taking in banks. This lends support to the

claim that providing bank managers with more downside exposure makes the financial system safer. The paper's results underscore that we should evaluate a banker's downside exposure in the context of his entire personal financial situation. We document that the passage of a MWPA primarily increased risk-taking for bank presidents with richer wives. This means that, in terms of policy, one size does not fit all. The optimal degree of banker liability depends on how much a banker has to lose in bad states of the world. Bankers who, through marriage or an independent source of wealth, face a comfortable cushion should have more downside exposure.

Finally, to evaluate the impact on real outcomes, we look at the use of steam power, a modern technology with high fixed costs. We find no evidence that companies were more likely to use steam power if more bank presidents in their county were married after the passage of a MWPA. This suggests that limiting bankers' liability has limited impact on the companies' ability to innovate and invest.

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Tables

Table 1: Dates of Passage of Married Women's Property Laws

State	Date of Introduction
CT	June 22, 1849
ME	March 22, 1844
MA	May 5, 1855
NH	July 2, 1860
RI	February 8, 1844
VT	October 9, 1862

Note. Sources: Kelly (1882), Individual state's statutes

Table 2: Summary Statistics of All Banks and Banks in our Final Sample

Panel A. All Banks

Variable	N	Mean	SD	P25	Median	P75
Log(Total Bank Assets)	494	13.31	0.870	12.61	13.23	13.85
Log(Paid-in Capital)	494	12.28	0.830	11.51	12.21	12.70
CT	494	0.160	0.370	0	0	0
MA	494	0.430	0.490	0	0	1
ME	494	0.120	0.330	0	0	0
NH	494	0.0800	0.280	0	0	0
RI	494	0.130	0.330	0	0	0
VT	494	0.0800	0.270	0	0	0
Assets / Capital	494	2.120	0.400	1.880	2.040	2.260
(Loans and Securities)/Capital	494	1.350	0.380	1.120	1.280	1.490
Fraction loans in arrears	476	0.0300	0.0600	0	0.0100	0.0300
Fraction loans in arrears - written down	476	0	0.0200	0	0	0
Earnings/Capital, 1873-1878	494	0.260	0.180	0.190	0.280	0.360
Log change in deposits, 1873-1878	493	0	0.490	-0.270	0.0100	0.250
Log change in loans, 1873-1878	493	-0.110	0.280	-0.240	-0.0700	0.0600
Loans exc. 10% of capital / All loans (max. 1874-1880)	494	0.0600	0.120	0	0	0.100
Mortgages / All loans (max. 1874-1880)	494	0.0300	0.0800	0	0.0100	0.0400

Panel B. Banks in our Final Sample

Variable	N	Mean	SD	P25	Median	P75
Log(Total Bank Assets)	413	13.29	0.840	12.64	13.23	13.77
Log(Paid-in Capital)	413	12.27	0.810	11.51	12.21	12.61
CT	413	0.170	0.380	0	0	0
MA	413	0.410	0.490	0	0	1
ME	413	0.130	0.330	0	0	0
NH	413	0.0900	0.280	0	0	0
RI	413	0.120	0.320	0	0	0
VT	413	0.0800	0.280	0	0	0
Assets / Capital	413	2.110	0.380	1.880	2.040	2.250
(Loans and Securities)/Capital	413	1.340	0.370	1.130	1.270	1.470
Fraction loans in arrears	394	0.0300	0.0600	0	0.0100	0.0300
Fraction loans in arrears - written down	394	0	0.0200	0	0	0
Earnings/Capital, 1873-1878	413	0.260	0.180	0.190	0.280	0.360
Log change in deposits, 1873-1878	413	0.0100	0.480	-0.250	0.0200	0.250
Log change in loans, 1873-1878	413	-0.110	0.280	-0.250	-0.0700	0.0600
Loans exc. 10% of capital / All loans (max. 1874-1880)	413	0.0600	0.120	0	0	0.100
Mortgages / All loans (max. 1874-1880)	413	0.0400	0.0800	0	0.0100	0.0400

Note. Unless stated otherwise, numbers refer to 1873. "Loans and securities" exclude all government securities that back up the issuance of bank notes. "Loans in arrears - written down" are loans in delinquency that the bank has put into liquidation and is in the process of writing down. "Earnings/Capital, 1873-1878" are accumulated profits and losses between 1873 and 1878, divided by 1873 capital. "Loans exc. 10% of capital (Mortgages) / capital (max. 1874-1880)" gives the maximum amount of loans exceeding 10% of paid-in capital (mortgages) reported between 1873 and 1880, divided by the total amount of loans in 1873.

Table 3: Summary Statistics Bankers

Panel A. Bankers married after a MWPA (Protected)

Variable	N	Mean	SD	P25	Median	P75
Year of MWPA	121	1849	5.200	1844	1849	1855
Age banker in 1870	121	51.37	11.07	43	51	59
Age at marriage	121	38.81	13.12	26.85	37.26	47.59
Second+ marriage	121	0.450	0.500	0	0	1
Age at first marriage	121	28.08	5.630	23.88	26.44	31.50
Total HH wealth 1870 (dollar)	110	102000	148000	26500	52650	110000
Log(Wf/Wm)	116	-0.0800	0.880	-0.550	0.0300	0.480
Age bank in 1873	121	27.17	18.15	16	21	41

Panel B. Bankers married before a MWPA (Not protected)

Variable	N	Mean	SD	P25	Median	P75	t-stat
Year of MWPA	392	1854	5.740	1849	1855	1855	7.12
Age banker in 1870	380	60.87	9.870	54	61	68	8.95
Age at marriage	380	28.76	7.460	23.78	26.56	31.27	-10.53
Second+ marriage	392	0.110	0.310	0	0	0	-8.86
Age at first marriage	380	26.85	4.760	23.52	26.09	29.28	-2.35
Total HH wealth 1870 (dollar)	358	123000	168000	29000	65000	138000	1.21
Log(Wf/Wm)	365	-0.210	0.830	-0.570	-0.100	0.260	-1.42
Age bank in 1873	392	29.64	18.25	17.50	23	42	1.30

Note. "Second+ marriage": banker's first wife passed away – remarried. "Total HH wealth 1870": a banker's total household wealth reported in the 1870 census. "Wf" and "Wm": wife's and husband's familial wealth in 1850. "Age bank": number of years since the bank originally started.

Table 4: Bank leverage

	(Loans and Securities)/Capital					
	(1)	(2)	(3)	(4)	(5)	(6)
Protection	0.096**	0.092**	0.071*	0.105**	0.078**	0.045*
	(0.039)	(0.043)	(0.038)	(0.045)	(0.038)	(0.025)
Observations	2808	2808	2784	2784	2784	2808
Adjusted R^2	0.254	0.282	0.300	0.291	0.314	0.842
	(Deposits + Due to) / Capital					
	(1)	(2)	(3)	(4)	(5)	(6)
Protection	0.108**	0.104**	0.081**	0.115**	0.087**	0.060**
	(0.043)	(0.048)	(0.041)	(0.049)	(0.041)	(0.028)
Observations	2808	2808	2784	2784	2784	2808
Adjusted R^2	0.271	0.301	0.315	0.307	0.326	0.849
	Reserves / (Deposits + Due to), Win(2.5)					
	(1)	(2)	(3)	(4)	(5)	(6)
Protection	-0.023	-0.018	-0.017	-0.018	-0.013	-0.032
	(0.015)	(0.016)	(0.017)	(0.015)	(0.016)	(0.020)
Observations	2808	2808	2784	2784	2784	2808
Adjusted R^2	0.194	0.302	0.320	0.306	0.326	0.721
Year FE						Y
State*Year FE	Y					
County*Year FE	N	Y	Y	Y	Y	
Bank FE	N	N	N	N	N	Y
Age at 1st mar. FE	N	N	N	Y	Y	N
Age FE	N	N	Y	N	Y	N

Note. Bank-year observations, 1867-1873 (pre-Panic). We regress a bank's leverage (measured by loans and securities over capital), deposits to capital and cash to deposit ratio on a banker's protection status (0: married before; 1: married after the passage of a married women property law) and a number of fixed effects. Year of first marriage and year of birth fixed effects are based on five year bins. The estimates with bank fixed effects are identified using the 142 changes in bank president that took place between 1867 and 1873. All estimates include a dummy for Boston and for different town sizes (<6,000, 6,000 - 50,000, >50,000). The cash to deposit ratio is winsorized at the 2.5th and 97.5th percentile. Standard errors (clustered at the individual bank level) in parentheses: $^{*}p < 0.1,^{**}p < 0.05,^{***}p < 0.01$.

Table 5: Realizing losses

	Fraction loans in arrears					
	(1)	(2)	(3)	(4)	(5)	(6)
Protection	-0.0009	0.0008	-0.0004	0.0011	-0.0003	0.0111
	(0.0044)	(0.0044)	(0.0058)	(0.0045)	(0.0061)	(0.0109)
Observations	1581	1581	1580	1580	1580	1581
Adjusted R^2	0.157	0.239	0.244	0.239	0.242	0.300
	Fraction loans written down					
	(1)	(2)	(3)	(4)	(5)	(6)
Protection	-0.0040**	-0.0036*	-0.0046*	-0.0036*	-0.0046*	-0.0010
	(0.0018)	(0.0021)	(0.0027)	(0.0021)	(0.0027)	(0.0012)
Observations	1581	1581	1580	1580	1580	1581
Adjusted R^2	0.018	-0.015	-0.006	-0.016	-0.007	0.025
	Fraction loans written down — in arrears					
	(1)	(2)	(3)	(4)	(5)	(6)
Protection	-0.0038**	-0.0038**	-0.0045*	-0.0040**	-0.0045*	-0.0042
	(0.0016)	(0.0019)	(0.0023)	(0.0019)	(0.0024)	(0.0039)
Fraction loans in arrears	0.2643***	0.3001***	0.2990***	0.3008***	0.3000***	0.2918**
	(0.0993)	(0.1132)	(0.1122)	(0.1130)	(0.1120)	(0.1450)
Observations	1581	1581	1580	1580	1580	1581
Adjusted R^2	0.278	0.287	0.293	0.288	0.294	0.288
Year FE						Y
State*Year FE	Y					
County*Year FE	N	Y	Y	Y	Y	
Bank FE	N	N	N	N	N	Y
Age FE	N	N	Y	N	Y	N
Age at 1st mar. FE	N	N	N	Y	Y	N

Note. Bank-year observations, 1870-1873 (pre-Panic). In the first panel, we regress the fraction of a bank's loans in arrears on a banker's protection status (0: married before; 1: married after the passage of a married women property law). In the second and third panel, we focus on the fraction of loans in arrears that are written down, where the third panel includes the overall fraction of loans in arrears as a control variable. We include a number of fixed effects. Year of first marriage and year of birth fixed effects are based on five year bins. All estimates include a dummy for Boston and for different town sizes (<6,000, 6,000 - 50,000, >50,000). Standard errors (clustered at the individual bank level) in parentheses: $^{*}p < 0.1,^{**}p < 0.05,^{***}p < 0.01$.

Table 6: Loans contrary to law: loans exc. 10% of capital and mortgages (max. over 1874-1880)

	max{Loans exc. 10% of capital}				
	(1)	(2)	(3)	(4)	(5)
Protection	0.042***	0.041***	0.034**	0.038**	0.028*
	(0.013)	(0.014)	(0.016)	(0.015)	(0.016)
Observations	413	413	413	413	413
Adjusted R^2	0.074	0.058	0.060	0.060	0.066

	max{Mortgages}				
	(1)	(2)	(3)	(4)	(5)
Protection	0.030***	0.033***	0.025**	0.031***	0.020*
	(0.009)	(0.010)	(0.011)	(0.010)	(0.011)
Observations	413	413	413	413	413
Adjusted R^2	0.093	0.046	0.060	0.092	0.110
State FE	Y				
County FE	N	Y	Y	Y	Y
Age FE	N	N	Y	N	Y
Age at 1st mar. FE	N	N	N	Y	Y

Note. Bank level observations. We regress the maximum amount of loans exceeding 10% of capital or the maximal amount of mortgages reported between 1873 and 1880 (divided by total loans in 1873) on a banker's protection status (0: married before; 1: married after the passage of a married women property law). National Banks were not allowed to lend more than the equivalent of 10% of paid-in capital to a single borrower. They were also not allowed to make mortgages. They ended up on a bank's balance sheet if (1) the bank had initially misrepresented the character of a loan, or (2) if a loan needed additional collateral. We include a number of fixed effects. Year of first marriage and year of birth fixed effects are based on five year bins. All estimates include a dummy for Boston and for different town sizes (<6,000, 6,000 - 50,000, >50,000). Standard errors in parentheses: $^{*}p < 0.1$,$^{**}p < 0.05$,$^{***}p < 0.01$.

Table 7: Performance, 1873 - 1878

	Earnings/Capital, 1873-1878					
	(1)	(2)	(3)	(4)	(5)	(6)
Protection	-0.032	-0.040*	-0.051**	-0.038*	-0.049**	-0.046*
	(0.020)	(0.021)	(0.023)	(0.021)	(0.024)	(0.024)
(Loans and Securities)/Capital						-0.045
						(0.029)
Observations	412	412	412	412	412	412
Adjusted R^2	0.101	0.108	0.115	0.105	0.112	0.116
	Log change in deposits, 1873-1878					
	(1)	(2)	(3)	(4)	(5)	(6)
Protection	-0.121**	-0.132**	-0.125**	-0.141**	-0.137**	-0.119*
	(0.055)	(0.055)	(0.060)	(0.056)	(0.063)	(0.061)
(Loans and Securities)/Capital						-0.286***
						(0.074)
Observations	413	413	413	413	413	413
Adjusted R^2	0.035	0.135	0.132	0.128	0.124	0.159
	Log change in loans, 1873-1878					
	(1)	(2)	(3)	(4)	(5)	(6)
Protection	-0.072**	-0.084**	-0.093***	-0.101***	-0.117***	-0.109***
	(0.032)	(0.033)	(0.036)	(0.033)	(0.037)	(0.037)
(Loans and Securities)/Capital						-0.120***
						(0.044)
Observations	413	413	413	413	413	413
Adjusted R^2	0.027	0.105	0.113	0.108	0.117	0.134
State FE	Y					
County FE	N	Y	Y	Y	Y	Y
Age FE	N	N	Y	N	Y	Y
Age at 1st mar. FE	N	N	N	Y	Y	Y

Note. Bank level observations. We regress accumulated profits and losses between 1873 and 1878 (divided by 1873 capital), and the log change in deposits and loans between 1873 and 1878 on a banker's protection status (0: married before; 1: married after the passage of a married women property law). We include a number of fixed effects. Year of first marriage and year of birth fixed effects are based on five year bins. All estimates include a dummy for Boston and for different town sizes (<6,000, 6,000 - 50,000,>50,000). Standard errors in parentheses: $^{*}p < 0.1,^{**}p < 0.05,^{***}p < 0.01$.

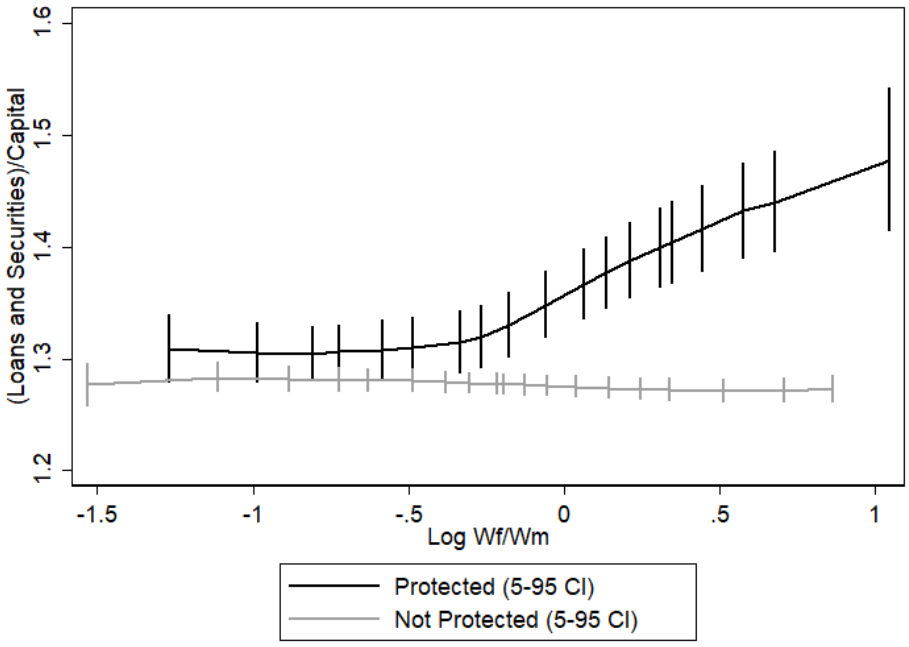
Table 8: Local Bank Capital and the Adoption of Steam Power by New England Firms, 1870

	(1)	(2)	(3)
Dependent variable:	=1 if firm uses steam power, 1870		
Log county loans, 1867-69	0.031***		
	(0.009)		
Log county capital, 1867-69		0.030***	0.026**
		(0.011)	(0.010)
Log county protected capital, 1867-69			0.002
			(0.003)
Log # establishments, 1870	0.024	0.027	0.023
	(0.020)	(0.021)	(0.020)
N	912	912	912
Adjusted R^2	0.189	0.188	0.187

Note. The unit of observation is the firm. Variables are defined as follows. *Steam power:* equal to 1 if the firm reports steam as its power source, and zero otherwise. Missing for firms who do not report a power source (approx. 15%). *Log county loans:* we aggregate total loans extended by banks up to the county level in 1867, 1868, and 1869, add 1 and take logs, and then average over these three years. *Log county capital:* we aggregate total bank capital up to the county level in 1867, 1868, and 1869, add 1 and take logs, and then average over these three years. *Log county protected capital:* we aggregate total bank capital *at banks with a president married after a MWPA* in 1867, 1868, and 1869, add 1 and take logs, and then average over these three years. *Log # establishments:* log number of manufacturing establishments at the county level in 1870, from published census data (Haines and ICPSR 2010). All regressions include fixed effects for state and 3-digit SIC code. Regressions are weighted by the inverse of the fraction of the county's banks with missing protection status. Linear probability models. Standard errors, clustered at the county level, in parentheses: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

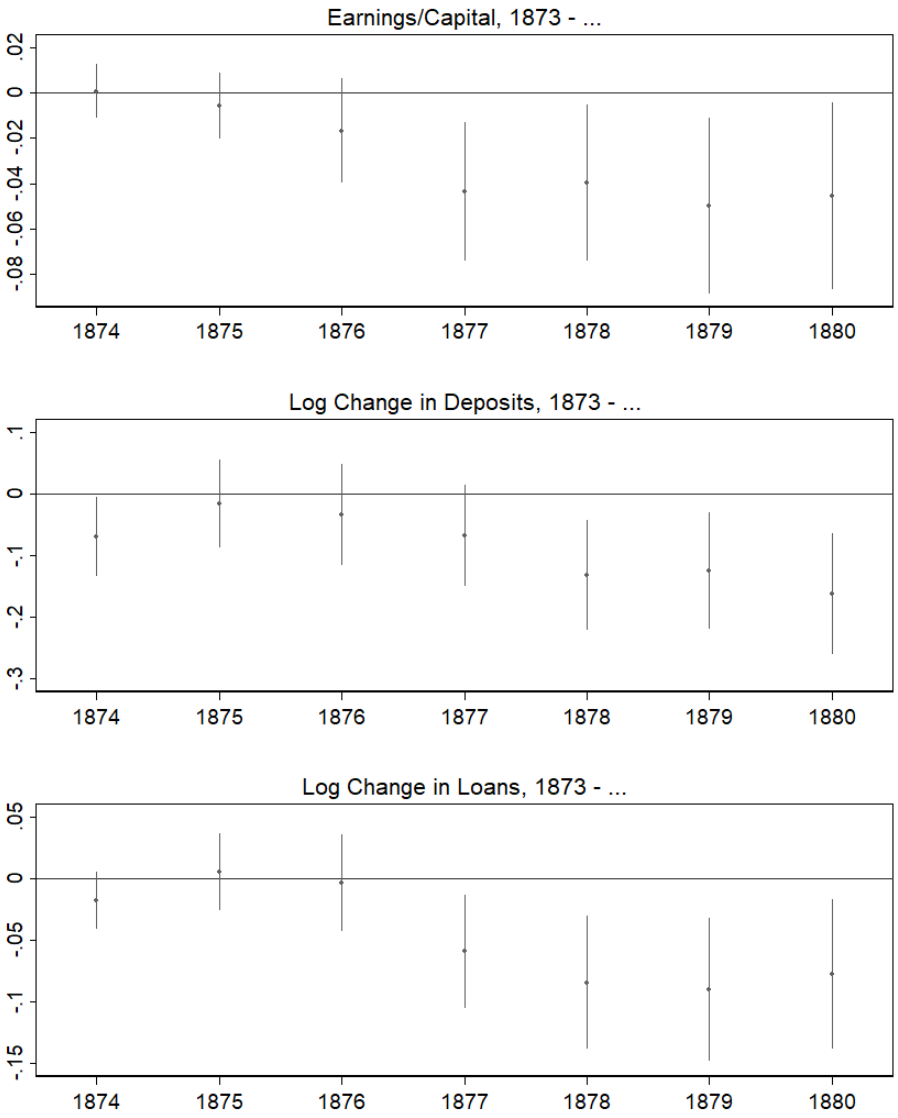
Figures

Figure 1: Leverage and relative wealth



Note. Non-parametric local mean smoothing using kernel weighted means. Vertical lines indicate 5th-95th percentile confidence intervals. Before plotting, the x and y variables are residualized with the fixed effects and control variables of Table 5, Column 2. "Wf" and "Wm" are the wife's and husband's 1850 familial assets. "Log(Wf/Wm)" captures how wealthy the wife was at marriage relative to the husband. "Protected": married after a MWPA.

Figure 2: Ex post performance

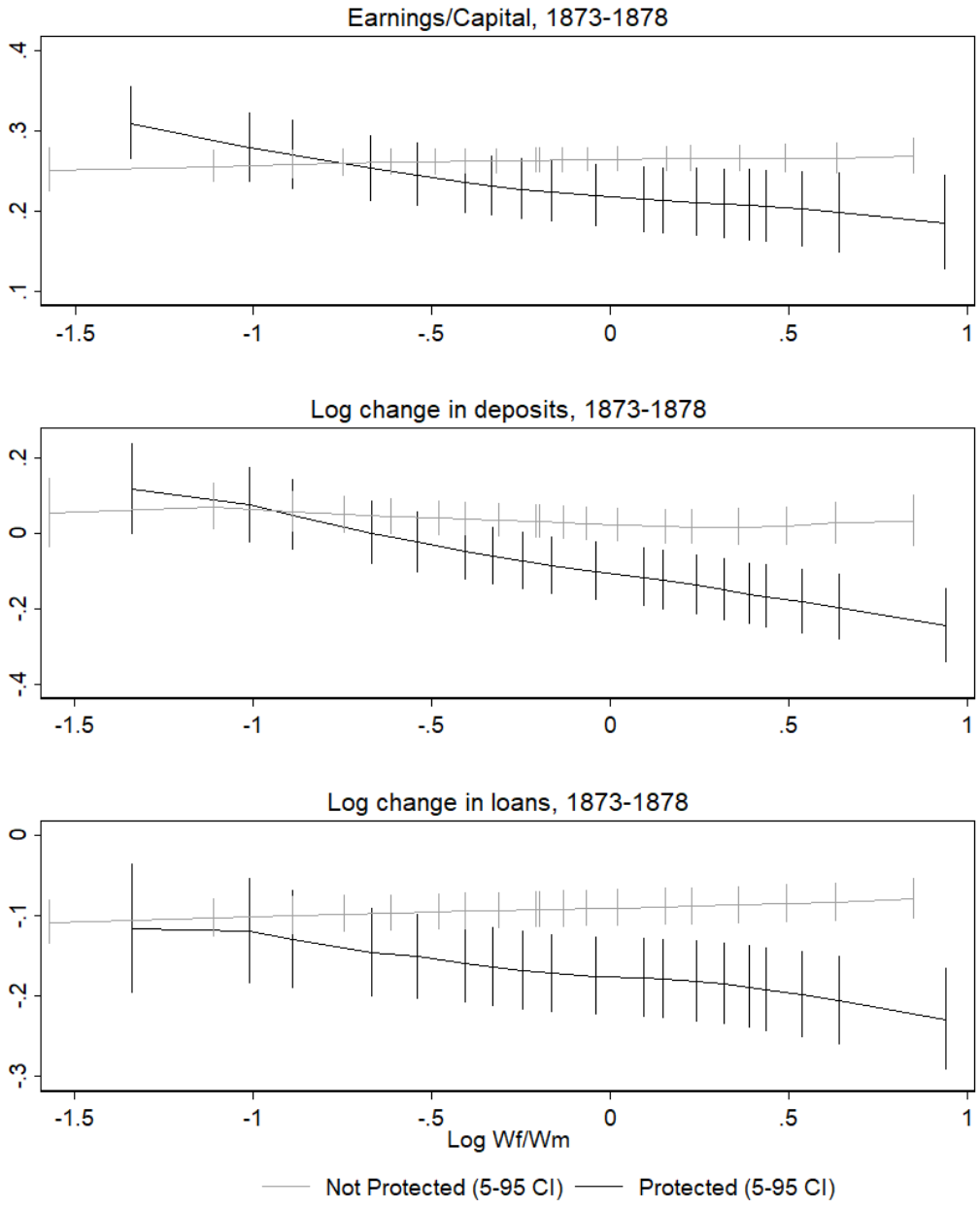


Note. The figure plots coefficient β, and its 5th-95th percentile confidence interval, on $Protection_{i,1873}$ from the regression

$$Y_{i,t-1873} = \beta Protection_{i,1873} + CountyF.E. + X_i + u$$

where $t \in [1874, 1880]$, and $Y_{i,t-1873}$ is either $Earnings/Capital_{i,t-1873}$ (bank $i's$ accumulated profits and losses between 1873 and t, divided by the banks capital in 1873), $Log(Deposits_{i,t}) - Log(Deposits_{i,1873})$, or $Log(Loans_{i,t}) - Log(Loans_{i,1873})$. $Protection_{i,1873}$ is a dummy with the value of 1 if the president of the bank in 1873 was married before the passage of married women's property law. X_i includes a dummy for Boston and for different town sizes (<5,000, 6,000 - 50,000, >50,000). "Protected": married after a MWPA.

Figure 3: Ex post performance and relative wealth



Note. Non-parametric local mean smoothing using kernel weighted means. Vertical lines indicate 5th-95th percentile confidence intervals. Before plotting, the x and y variables are residualized with the fixed effects and control variables of Table 7, Column 2. "Wf" and "Wm" are the wife's and husband's 1850 familial assets. "Log(Wf/Wm)" captures how wealthy the wife was at marriage relative to the husband. "Protected": married after a MWPA.