

# Branching for Caution: Banks in England and Wales during the 1878 Financial Panic

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## Abstract

Using a bank-level dataset on joint-stock banks in England and Wales between 1874 and 1885, I show that the exposure to an unexpected financial panic in 1878 led to the opening of new bank offices. The panic resulted from the failure of the City of Glasgow Bank. I include bank and year fixed effects in my baseline estimation and construct an instrumental variable based on the number of newspapers in the towns where bank headquarters were located. Banks opened new offices as a signal of stability to increase public confidence because large banks were perceived as more stable. The impacts were mainly driven by banks with a below-median number of offices before 1878. New offices also facilitated the shareholders' monitoring of banks. Bankers' emphasis on English banking practices substituted for new offices in towns with higher exposure to the nationalism spread by Conservative newspapers.

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# 1 Introduction

How do financial crises affect bank branching? Banks build branches in part to increase the access of consumers to banks (Aguirregabiria et al., 2016). The opening of new bank branches can increase the supply of credit and the output of enterprises that rely heavily on external finance (Mitchener and Wheelock, 2013; Rajan and Ramcharan, 2011). Rysman et al. (2023) find that the 1997 Financial Crisis led to the closure of bank offices in Thailand, because the crisis made some rural offices unprofitable for banks. However, it is also likely that banks open more offices because bank offices play an important role in sustaining the confidence of depositors and borrowers. Customers in the UK keep visiting bank offices and in-person contact with staff in offices provides them with a sense of security.<sup>1</sup> Bank offices are also an important tool to build the confidence of business owners (Baruch, 2016). In this paper, I use the 1878 financial panic, when there were no government regulations to protect depositors, to understand how financial crises might affect the opening of new bank offices and how new offices served as a device to increase public confidence in banks.

Bank branching is important because it contributes to the integration of national financial markets (Mitchener and Ohnuki, 2009), increases competition, and increases the exit of less competitive banks, which contributes to the stability of the banking system (Carlson and Mitchener, 2006; Bonhoure et al., 2023). After the panic in 1878, the English banking system remained relatively stable until 2008, even during the Great Depression (Grossman 1994; Turner 2014). The large branch networks of banks in Britain and Canada might be a reason leading to more stable banking systems than that in the United States (Grossman, 1994). In the second half of the 19th century, the number of bank offices kept growing from about 1.5 thousand in the 1850s to more than 7 thousand before the First World War, despite three financial crises.

Political forces play an important role in determining the development of banking systems

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<sup>1</sup>Based on a report by the *Fintech Global* on the Toluna Financial Services Sentiment Indicator about UK population's finances. The article can be accessed at <https://fintech.global/2021/09/29/confidence-in-banks-and-bank-branches-remains-high-in-the-uk/>

(Calomiris and Haber, 2015). Bank panic result from the lack of trust of depositors in banks, while building relationships with depositors can improve the stability of banks when facing crises (Iyer and Puri, 2012). Therefore, it is important to understand the role of media, as tools of political parties, in the branching of banks, which might be beneficial for economic development. The media could either highlight irresponsible bank practices to weaken public confidence in banks or emphasize the adherence to regulation policies and public interests to build public confidence. The existence of large presses online and offline makes it harder to measure the impacts of newspapers. In this paper, I go back to the 1870s when readers relied on local newspapers to gain information (Williams, 2010). I seek to understand how the newspapers affected the strategies that banks adopted to build public confidence in them.

In this paper, I introduce a new dataset on joint-stock banks in England and Wales between 1874 and 1885. My data is taken from the *Banking Almanac*, the *Economist*, and *The Stock Exchange Yearbook*. I have digitized this data myself. I test how the shocks that banks received during the financial panic in 1878 resulting from the failure of the City of Glasgow Bank increased the number of bank offices.<sup>2</sup> I measure the shocks using the inverse hyperbolic sine transformation of the relative drop in the market value of banks between the end of September and December in 1878. My baseline estimation is a two-way fixed effects model including bank and year fixed effects. I estimate the baseline estimation using ordinary least squares (OLS). I find that a one-standard deviation larger shock in 1878 predicts a 9% standard deviation increase in the number of bank offices after 1878. The results suggest that receiving large negative shocks during the 1878 financial panic encouraged banks to build more new offices after 1878. Therefore, English joint-stock banks increased the number of their offices in response to the negative shocks, which is different from the pattern observed in Thailand in 1997.

There exist potential concerns about endogeneity in the OLS estimation results, and I use an instrumental variables (IV) strategy. The baseline instrument is based on the number of

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<sup>2</sup>The number of offices is the number of branches plus 1, the number of headquarters.

local newspapers in October 1878 in towns where bank headquarters were located. I use the newspapers recorded in the 1895 *Newspaper Press Directory*, following Beach and Hanlon (2023). The intuition for this instrument is that the number of newspaper articles about the City of Glasgow Bank rose sharply after its failure. These articles discussed extensively the flight of shareholders and directors, the misconduct of directors, the disruption to businesses, and the bankruptcy of shareholders. The readers in towns with more local newspapers were more likely to be concerned about the security of deposits that they placed with local banks. Therefore, they were more likely to withdraw deposits from local banks, which led to larger negative shocks to the local banks. The IV estimates suggest that a one-standard deviation larger shock in 1878 would lead to a 12.5% standard deviation increase in the number of bank offices after 1878. This estimate is approximately 50% larger than the corresponding OLS estimate. The difference in magnitudes is likely to be due to measurement error in the negative shocks that banks received. The transactions of bank shares involved frictions, including the approval process of directory board members. Therefore, the prices of bank shares did not necessarily reflect the shocks that banks received. Due to high trade costs, the price might remain unchanged because no trade was conducted, or it could drop more than the actual shock.

An important aim of banks after the panic was to rebuild the confidence of depositors and shareholders. Contemporary bankers kept discussing their efforts to provide depositors with more security (Dick, 1884, p.328). Smaller banks were more likely to exhaust their reserves during crises while large branch banks were perceived as more stable than unit banks by contemporary bankers (Gilbart and Michie, 1882, p.121-123). I first look into the differential responses of banks with an above-median number of offices and those with a below-median number of offices in 1877. In heterogeneity analyses, I show that the increases in the number of offices were mainly driven by banks with a below-median number of offices in 1877. This is consistent with my interpretation that the opening of new offices was driven by the aim to increase public confidence in banks. Smaller banks also increased the amount of subscribed

capital, which was the capital that shareholders promised to pay to cover depositors' losses if the bank went bankrupt in the future. They also increased paid-in capital, the capital paid into banks. The increases in the capital of banks increased the security of deposits (Dick, 1884, p.328) and would increase the depositors' confidence. The concerns about the stability of banks might be driven by the loss of liquidity that small banks experienced after the failure of the Glasgow bank.

New offices also served as a device to facilitate shareholders' monitoring of banks, which was a tradition of English banks, and increase public confidence. In towns with higher exposure to Conservative newspapers, the public was more likely to accept the nationalism that Conservative newspapers spread. Therefore, banks in towns with higher exposure to Conservative newspapers emphasized their English identity and cautious practices to substitute for setting up new offices and increasing subscribed capital to increase the depositors' and shareholders' confidence in them. In towns with lower exposure to Conservative newspapers, banks with fewer Scottish directors opened more bank offices, while banks with more Scottish directors increased their capital to increase public confidence.

I show that my results are robust to using the changes in the market value of banks between September and October, November, and December in 1878 after the failure of the Glasgow. English banks held annual meetings of shareholders in January and February each year, so the stock prices in January and February 1879 absorbed the impacts of the strategies that banks adopted in response to the shocks. They are robust to different transformations of the shocks that banks received, to an alternative instrument that is built based on the number of general-interest newspapers, and to dropping two amalgamation cases where banks with no more than 10 offices absorbed banks with three to four times as many offices as they possessed. I use a placebo instrument constructed based on the number of newspapers established between 1879 and 1888, 10 years after 1878. In a placebo test, I show that the number of newspapers established after 1878 was uncorrelated with the number of bank offices.

## 1.1 Related Literature

This paper first engages with the literature on the reasons for bank branching. Banks gain new branches by purchasing existing small banks and building *de novo* new offices to enter new markets (Carlson and Mitchener, 2009). Banks branch to attract new deposits (Aguirregabiria et al., 2016) and to compete against other banks in other financial services (Bonhoure et al., 2023). The expansion of banks can diversify geographic risks (Kuehn, 2018), and help banks achieve higher market concentration (Cohen and Mazzeo, 2010; Kuehn, 2018) to gain higher stock prices (Braggion et al., 2022). When financial crises happen, banks contract their office networks due to the lack of liquidity and negative expected profits (Rysman et al., 2023). However, the role of bank offices as a signal of stability has not been investigated. Rysman et al. (2023) focus on a financial crisis that happened in Thailand in 1997. Modern banks are usually regulated by government policies that aim to protect depositors. The involvement of governments in bank operations makes it harder to separate the impacts of bank operations aiming to build depositors' confidence from those of government policies.

In this paper, I use a setting where there was little regulation of banks and no bailout policies (Braggion et al., 2017) to remove potential confounding effects of government policies. I employ the changes in the number of offices of English joint-stock banks after a financial panic resulting from the failure of a Scottish bank, outside England, to show that banks increase the number of offices to increase the confidence of depositors in them.

This paper is also related to the literature on the role of newspapers in affecting the strategies of firms in response to shocks. Local financial news affects the investors' perceptions of firms (Engelberg and Parsons, 2011; Ben-Rephael et al., 2017). The depositors' trust in banks is important for the stability of banks (Iyer and Puri, 2012). Financial institutions that are more credible remain more stable during panic and crises (Gurun et al., 2017). Readers with different views look for news that is consistent with their views and possess different narratives of the same event (Goldman et al., 2024). Therefore, the political views spread by newspapers before the panic might affect the strategies that banks adopt to in-

crease depositors' confidence. In the modern world, readers receive information from large presses both online and offline. It is hard to measure the exposure of readers to news.

This paper uses Victorian England, when local newspapers were especially important in providing local readers with access to financial news. The geographical distribution of newspapers by 1877 created plausibly exogenous shocks to the market value of banks. I show that stronger exposure of readers to adverse financial news led to larger negative shocks to the market values of banks. The media could affect the branching decisions of banks by creating shocks to the stock prices of banks. Further, the political orientations of newspapers affected the strategies that banks adopted to rebuild public confidence in them.

This paper also relates to the literature on factors that affect public trust in banks. The political and cultural views of people affect their trust in banks (Fungáčová et al., 2019). The trust of the public in banks goes down after financial crises (Stevenson and Wolfers, 2011) and affects economic outcomes (Sapienza and Zingales, 2012). In recent years, the business culture in banks has led to dishonest behaviours (Cohn et al., 2014) and might weaken the trust in banks. This paper shows that the opening of new offices also helped increase public confidence by facilitating the monitoring of banks. Revisiting the cautious English banking tradition, when combined with nationalism advertised by Conservative newspapers, helped increase the confidence in banks and substituted the opening of new offices.

In Section 2, I introduce the historical background involving the 1878 Financial Panic, the expansion of English banks, and the role of newspapers during the panic. I introduce the data and empirical strategies that I use in Section 3. I report baseline estimation results and robustness checks in Section 4. Section 5 discusses mechanisms, and Section 6 concludes.

## 2 Historical Background

### 2.1 The Start of the Panic

*"It was a calamity so unlooked for, so huge and disastrous, that it riveted men's gaze and made their hearts stand still and we shall all remember it to our dying day as a landmark in the history of our generation."*

— Alexander Wilson (1879), cited in Button et al. (2015)

British bankers were already aware of the poor credit of the City of Glasgow Bank as early as 1857, but they did not know the detailed situation of the bank until a few days before the failure of the bank (Gilbart and Sykes, 1907, p364-368). The directors of the City of Glasgow Bank revealed their financial situation to other banks to borrow money. They failed because other banks thought that the City of Glasgow bank could not be bailed out.

On October 2nd, 1878, after the conditions of the City of Glasgow Bank were revealed to external bankers, the closure of the City of Glasgow Bank was announced, with a deficit larger than 5 million pounds (Button et al., 2015). It was a sudden shock to the money market in Britain and created panic and disruptions in business activities.<sup>3</sup> British newspapers reported extensively on the bankruptcy of the shareholders (Turner, 2014), the flight of directors and shareholders from their residence locations,<sup>4</sup> and the failure of businesses which were connected to the Glasgow bank.<sup>5</sup> The City of Glasgow bank was a large joint-stock bank with 134 offices across Scotland and a paid-in capital of 1 million pounds. The failure of such a large bank led to widespread panic about the banking system, which soon spread to

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<sup>3</sup>The descriptions of the panic of businessmen, workers, widows, and spinsters could be found in a lot of contemporary newspapers. Newspaper articles also extensively discussed the disruptions that the failure would bring to the local businesses and the national economy.

<sup>4</sup>The *Nottingham Evening Post* published on Tuesday 22 October 1878 mentioned that a shareholder in Fife sold his belongings and disappeared. It was guessed that he was escaping to Canada.

<sup>5</sup>The *Derby Mercury* published on Wednesday 09 October 1878 mentioned that the failure of the City of Glasgow Bank would lead to the failure of businesses that relied heavily on the bank



England and Wales. There was a more than 10% decrease in the deposits of London banks (Collins and Baker, 2003). Outside London, more than 40% of banks lost more than 10% of their deposits.<sup>6</sup> Despite the panic, the final outcomes were not disastrous to the English banking system. Among large banks, only the West of England and South Wales District Bank failed, but some of its offices were reconstituted in 1879 and they became the Bristol & West of England Bank. The West of England and South Wales District Bank was the 9th largest bank in England according to the amount of paid-in capital before its failure. Four other small banks failed.

Contemporary bankers blamed the repeated illiquid loans to firms of low quality for the failure of banks in 1878. The directors of the Glasgow bank hoped that the loans might come back one day in the future (Gilbart and Sykes, 1907, p.389-391). The City of Glasgow Bank held land in Australia and New Zealand. They also held collateral involving multiple different industries.<sup>7</sup> Directors could manipulate the values of the collateral and misrepresented the assets of the bank to shareholders in fake balance sheets.<sup>8</sup> The collateral was illiquid and located far away from Britain, so the Glasgow bank could not easily sell them for cash. Therefore, after the failure of the Glasgow bank, British bankers realized the importance of liquid assets. After the crisis, the asset portfolios of joint-stock banks in England and Wales began to change, with the ratio of liquid assets rising from 31% in 1877 to more than 40% in the early 1880s (Collins and Baker, 2003). The ratio kept rising until the First World War.

The failure of the City of Glasgow Bank also led to a sudden change of English banks from unlimited liability to limited liability (Turner, 2014, p.74). 43 out of 67 English banks in my sample adopted unlimited liability in 1877, right before the failure of the Glasgow bank. In 1885, only 5 out of 63 did not transform to limited liability. The possibility of going bankrupt due to misbehaviours of directors and office managers increased the risks

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<sup>6</sup>Based on the 22 banks that published balance sheets both for 1877 and 1878.

<sup>7</sup>They include tea-garden properties, stock shares in steam, telegraph, oil, cotton, and tool-factory companies (Gilbart and Sykes, 1907, p.389).

<sup>8</sup>In contemporary articles discussing the legal actions against the directors of the Glasgow bank, the misrepresentation of assets and fake balance sheets were repeatedly mentioned.

to shareholders of holding the shares of banks. Therefore, the adoption of limited liability lowered the costs of opening new offices from the perspective of shareholders. It is likely that the shareholders would be more willing to approve bank branching. However, in this paper, I show that the adoption of limited liability after the failure of the Glasgow bank was not a reason leading to the opening of new offices. It is coherent with the view that shareholders did not view banks that adopted limited liability differently from those that adopted unlimited liability (Acheson and Turner, 2008).

## **2.2 The Expansion of English Banks**

In the first half of the 19th century, all banks in England adopted unlimited liability. Therefore, the shareholders of banks usually lived close to the branches of banks to keep a close watch on the banks (Turner, 2014, p.109-112). The English banks and their shareholders formed a close relationship where shareholders closely monitored the operations of the banks because they also knew depositors and borrowers from the same region well (Alborn, 2003, p.130-131). Joint-stock banks began to build new branches in the 1860s, when banks became eligible for limited liability (Barnes and Newton, 2018). From the 1870s to the First World War, English joint-stock banks expanded geographically, by setting up new branches and taking over local country banks and small joint-stock banks in a largely unregulated environment (Braggion et al., 2017). The branching of banks was one of the most significant characteristics of British banks in the 1880s and 1890s (Barnes and Newton, 2018).

There were several potential motives leading to the expansion of English banks after 1878. The first was to make their depositors feel safe about depositing money with banks. Joint-stock banks with branches were perceived as safer than single-unit banks because they possessed higher amounts of funds and capital, while all branches had access to the funds of the bank (Gilbart and Michie, 1882, p.121-123). The increase in capital and reserves could support banks in difficult times (Palgrave, 1886, p.46). Therefore, if banks opened new offices to increase public confidence, it was likely that banks also increased the amount

of capital in response to the shocks after the failure of the Glasgow bank. Second, besides making the banks look more stable, banks also built new offices to provide customers with more convenient physical access to banks instead of attracting new deposits (Palgrave, 1886, p.49). The proximity to bank offices could facilitate the monitoring of shareholders over managers and increase the public's belief in the proper management of banks.

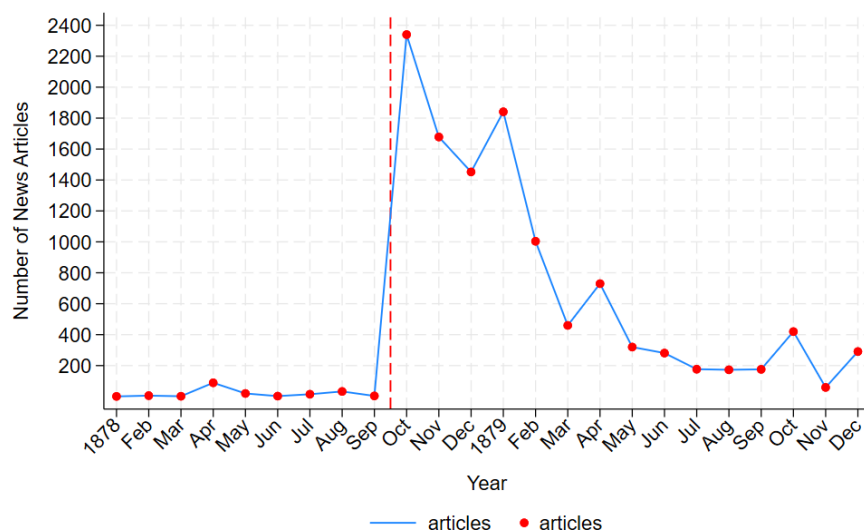
The third involves the adoption of limited liability. As unlimited liability incentivized shareholders to monitor the operation of bank offices (Turner, 2014, p.109-112), the adoption of limited liability might have alleviated the concerns of shareholders about monitoring and encouraged them to approve the building of new offices. The number of bank offices across England and Wales began to increase after banks were allowed to adopt limited liability in 1862 (Barnes and Newton, 2018). After almost all banks adopted limited liability, the number of bank offices increased from about 2,000 in 1885 to more than 6,000 before the First World War (Braggion et al., 2022).

## **2.3 The Roles of Newspapers**

Provincial newspapers played an important role in providing information to local communities in the 1870s and the 1880s (Williams, 2010, p.117). Newspapers extensively reported the conditions of middle-class shareholders (Lee, 2012) and also covered the shocks that the failure of the Glasgow bank might bring to the businesses in the country. Journalists wrote thousands of articles discussing this contentious financial issue, as can be seen in Figure 1.

In this paper, I build the instrumental variable using the number of newspapers in the towns outside London. I focus on the banks outside London for two reasons. First, London was an important financial hub not only for the country but also for the world. Banks in London could access funds from London bankers, international bankers, and also the Bank of England. Second, London was the home of the national presses that were interested in reporting news across the whole country. Therefore, the number of newspapers might not serve as a good measure of exposure for London banks.

Figure 1: The number of newspaper articles discussing the City of Glasgow Bank



*Notes:* Based on my search using two keywords, ‘City of Glasgow Bank’ and ‘Glasgow City Bank’, in the website of the *British Newspapers Archives* on April 2nd, 2024. I cover newspapers in England and Wales but outside London.

The City of Glasgow Bank did not receive much attention from English newspapers before its failure. In the first nine months in 1878, the number of newspaper articles mentioning the Glasgow bank rarely went above 10.<sup>9</sup> The number of news articles about the City of Glasgow Bank increased sharply after the failure of the bank. In Figure 1, I show the changes in the number of articles mentioning the failure of the bank. Before October, it was rare for the monthly count of press articles about the bank to exceed 50, occasionally hitting that number in a few months. However, the failure of the bank made it a focus of newspapers. In the month of the collapse of the Glasgow bank, the number of articles soared to over 2,300. The City of Glasgow Bank remained widely discussed in the following five months. After February 1879, the total number of articles that discussed the Glasgow bank gradually dropped. The small peak in October 1879 was due to the release of the five directors of the

<sup>9</sup>The number of newspaper articles went up in April and May 1878 because a branch of the Glasgow bank in the Isle of Man was robbed. The trial of the robbers in August 1878 brought about two more dozens of articles.

Glasgow bank on October 8th, 1879.

## 3 Data and Empirical Strategies

### 3.1 Data Sources and Variables

The period that I cover is the period between 1874 and 1885, which is centred on the collapse of the City of Glasgow Bank. I start from 1874, 5 years before the failure of the Glasgow Bank. I stop in 1885 before the amalgamation wave in England began. Banks in London began to acquire banks outside London (Braggion et al., 2022) and banks outside London also tried to access London, either by moving their headquarters to London<sup>10</sup> or merging with London banks. The aims of banks might be different from theirs just after the failure of the Glasgow bank. I digitize the information about banks from the *Banking Almanac*. The *Banking Almanac* collected the information about banks from the banks. Then I collect the numbers of bank offices,<sup>11</sup> the location of the headquarters, the adoption of limited liability, and the capital structure of banks in England and Wales. The introduction of this data is one contribution of this paper. I also hand-collect the balance sheets published in the annual reports of English joint-stock banks from the *Economist*. I developed standardized variables to harmonize the naming conventions across bank balance sheets.<sup>12</sup> The variables that I extract from the balance sheets for this paper include the amount of cash at hand, the deposits, and the liabilities of banks.

I measure the negative shocks that joint-stock banks received after the failure of the City of Glasgow Bank using the change in market values of banks between the last business day in September 1878 and the last business day in December 1878. As shown in Eq. (1), For bank

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<sup>10</sup>For example, the Industrial Bank, Limited, moved its headquarters from Newcastle-on-Tyne to London in 1880.

<sup>11</sup>The number of offices of a bank is the sum of 1, the number of the headquarters, and the number of branches.

<sup>12</sup>For example, the cash that banks held included cash, deposits with other banks, deposits with bill brokers, and stamps. I exclude some banks when I analyze liquid assets because they only reported the sum of the bills and cash that they held together.

$i$  whose headquarters was located in town  $j$ , I measure the shock that it received using the percentage point change of the market value of bank  $i$ , because stock prices reflected firm-specific shocks that banks received (Grossman, 1976). Only a few banks regularly published balance sheets, so stock price and market value were the most comprehensive measures for the shocks that banks received in 1878.

$$Shock_{i,j} = \left( \frac{MarketValue_{i,j,post-shock}}{MarketValue_{i,j,pre-shock}} - 1 \right) \times 100\% \quad (1)$$

The trade of bank stocks was not instant in the 1870s and might take a long time, especially for some banks with unlimited liability that required approval from directory boards (Turner, 2014).<sup>13</sup> Therefore, the stock prices of joint-stock banks might remain unchanged immediately after the failure of the Glasgow bank. If there were no transactions, the prices of stocks and the market values of banks would not change. In my sample, the market values of almost half of all the banks remained unchanged between September and December 1878. The unchanged bank stock prices could be either due to the firm trust of shareholders and depositors in banks or to the directors who wanted to signal the bank was still safe by delaying share transactions. In the second case, the directors who tried to stop trades during the panic might also have been inclined to open more offices after 1878 to signal the stability of banks. The negative correlation between the shocks that banks received and eagerness to signal stability would lead to downward biases in the OLS estimation if the bank opened more offices after 1878 to signal its stability. I do not choose months later than December 1878 to define the end of the period defining market value changes, because English banks held shareholder annual meetings in January and February 1879 to make decisions on how to strengthen banks in response to the shocks. The stock price data that I

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<sup>13</sup>Sometimes, shareholders who wanted to sell their stocks needed to post an announcement in a newspaper and advertise their possessions to show that they were able to afford the liability related to the shares even after they sold the shares.

use comes from the *Investor Monthly Manual*.<sup>14</sup>

To construct the instrumental variable, I use the number of newspapers in the headquarters of joint-stock banks before the failure of the Glasgow bank. My approach follows Beach and Hanlon (2023). Newspapers played an important role in spreading information about the failure of the City of Glasgow Bank to towns outside London (Lee, 2012; Turner, 2014). To the public, the sudden failure of the City of Glasgow Bank was unexpected, because even expert bankers from other banks knew about the troubles of the Glasgow bank only a few days before its failure. Therefore, the number of local newspapers in towns before the failure of the Glasgow bank provide a plausibly exogenous shock to the market values of banks. After the City of Glasgow Bank failed, newspaper articles about the bank rose in number about 100 times, as can be seen in Figure 1. The information about newspapers comes from the 1895 edition of the *Newspaper Press Directory*, published by C. Mitchell & Co. of London. The directory records the starting years of newspapers, so I can retrieve the number of newspapers in each town before the failure of the City of Glasgow Bank. The information that I collect includes newspapers' opening years, a dummy measuring whether they were general-interest newspapers as opposed to newspapers with specific focuses on themes including sports and arts, and the political orientations of newspapers.<sup>15</sup>

### 3.2 Summary statistics

Table 1 shows the summary statistics of the main variables. Before the failure of the City of Glasgow Bank, the mean number of offices was 10.478. The mean amount of paid-in capital was £240,459 and the mean number of partners was 433. Most of the banks were in Northwest England and the mean share of manufacturing employment in 1861 was 35.6%.<sup>16</sup>

From 1875 to 1885, for the banks in the sample, the mean number of bank offices grew

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<sup>14</sup>The data is made available through the International Center for Finance at Yale University. The website is <https://som.yale.edu/centers/international-center-for-finance/data/historical-financial-research-data/london-stock-exchange>.

<sup>15</sup>Newspapers usually adopted Conservative views, Liberal views, or remained neutral and independent.

<sup>16</sup>1861 was the last wave of census that reported the manufacturing employment.

Table 1: Summary Statistics

	(1)	(2)	(3)	(4)	(5)	(6)
variables	year	N	mean	sd	min	max
No. of Offices	Pre-Shock	67	10.478	12.875	1	55
Limited Liability	Pre-Shock	67	0.358	0.483	0	1
Capital Paid	Pre-Shock	67	240.459	174.077	32	905
No. of Partners	Pre-Shock	67	433.269	302.879	61	1504
Latitude	Pre-Shock	67	53.256	0.881	50.381	54.978
Longitude	Pre-Shock	67	-2.062	0.7561	-4.120	-0.337
Share Manufacture	Pre-Shock	67	0.356	0.109	0.181	0.585
No. of Offices	1875	66	9.394	11.189	1	52
Limited Liability	1875	66	0.348	0.480	0	1
Capital Paid	1875	66	233.761	174.590	32	905
No. of Offices	1880	66	11.788	14.263	1	65
Limited Liability	1880	66	0.697	0.463	0	1
Capital Paid	1880	66	255.090	177.634	40	905
Capital Subscribed	1880	63	1057.003	1116.285	100	5430
No. of Offices	1885	63	14.111	16.763	1	78
Limited Liability	1885	63	0.921	0.272	0	1
Capital Paid	1885	63	273.623	195.013	40	905
Capital Subscribed	1885	61	1260.001	1313.775	200	6000

Notes: Capital is measured in units of thousands of pounds.

from about 10 to more than 15 in a decade. 24 out of 67 banks had adopted limited liability in 1875, while the number was 60 out of 65 by 1885. Meanwhile, English banks tried to provide more security to their depositors after 1878 (Dick, 1884, p.328). The amount of paid-in capital increased by about 30%. The average amount of paid-in capital was about 250 thousand pounds in 1880, worth about 2.5 million pounds today.<sup>17</sup> As some banks were absorbed or went bankrupt, the number of banks slightly went down to 63 in 1885.

### 3.3 Empirical strategies

To estimate the impacts of shocks after the failure of the City of Glasgow Bank on banks, I use a two-way fixed effects model as shown in equation (2).

$$\begin{aligned} \text{IHS}(\text{No. of offices}_{i,j,t}) = & \beta_0 + \beta_1 \times \text{IHS}(\text{Shock}_{i,j}) \times 1(\text{Post Crisis}_t) \\ & + x'_{i,j} \times \eta_t + \delta_i + \eta_t + \varepsilon_{i,j,t} \end{aligned} \quad (2)$$

<sup>17</sup>Calculated based on the inflation calculator of the Bank of England.



The independent variable,  $\text{IHS}(\text{Shock}_{i,j})$ , is the inverse hyperbolic sine transformation of the percentage relative changes in the market value of bank  $i$  between the end of September 1878 and the end of December 1878.<sup>18</sup> This variable measures the shock that bank  $i$  received within 3 months of the sudden failure of the City of Glasgow Bank. I use the inverse hyperbolic sine transformation for the relative changes of bank market values because the values can take negative values, zero, and positive values.<sup>19</sup> If a bank  $i$  experienced a drop in its market value after the failure of the Glasgow bank, the shock that it receives is negative. The dependent variable,  $\text{IHS}(\text{No. of offices}_{i,j,t})$  is the inverse hyperbolic sine transformation of the number of offices of bank  $i$  in year  $t$ . The headquarters of bank  $i$  is in town  $j$ .  $1(\text{Post Crisis}_t)$  is 1 when  $t$  is after 1878.

If the estimated coefficients are negative, it suggests that a bank that experienced a larger relative drop in its market value, the value of the independent variable being smaller after 1878, opened more new offices after 1878. Banks expanded in response to the financial panic in 1878. If the coefficients are positive, it suggests that banks contracted in response to the financial panic in 1878.

$x'_{i,j}$  includes characteristics of bank  $i$  prior to the failure of the City of Glasgow Bank, including the adoption of unlimited liability in 1877, the number of bank offices in 1877, the number of partners in 1877, the amount of paid-in capital in 1877, and the characteristics of town  $j$  including the latitude, the longitude, and the share of manufacturing employment in 1861.<sup>20</sup> The pre-crisis characteristics of the banks, the geographic locations, and the economic development of towns might affect the shocks that banks received during the panic and also the opening of new bank offices. I include the interaction of pre-shock characteristics and year fixed effects to control for the changes in the number of bank offices after the failure

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<sup>18</sup>If the market value of a bank drops by 20%, then the value of the independent variable after 1878 is  $\text{asinh}(20) \approx 3.690$ .

<sup>19</sup>The value of the relative change in the market value of a bank was negative if the market value of the bank fell in the three months after the failure of the Glasgow bank. It was zero if the prices of bank shares did not change. It could also be positive but it was rare.

<sup>20</sup>Taken from the replication data of Beach and Hanlon (2023).

of the Glasgow bank.<sup>21</sup>  $\delta_i$  are bank fixed effects, which control for the time-invariant factors that had constant impacts on the number of bank offices.  $\eta_t$  are year fixed effects, which control for the trends in the number of offices of all banks. Standard errors are clustered at the town level in the baseline regression.

### 3.4 Identification

The OLS estimation of equation (2) may be subject to biases resulting from omitted variables. Unobserved factors that affected the relative changes in the market value of banks in 1878 were likely to affect the opening of bank offices after 1878. For example, some banks might be more adept at dealing with panics and preserving the confidence of depositors. They were more likely to have a smaller drop in their market value, making the value of the independent variable larger. After 1878, these banks were likely to be more willing to open more offices to signal their stability to increase public confidence. Therefore, the OLS estimation is subject to upward biases resulting from omitted variables. The impacts of the unobserved skills of image management are not absorbed by the bank fixed effect, because the unobserved factors were likely to have different impacts on bank offices in different years after 1878.

To alleviate concerns about endogeneity, I adopt an instrumental variables strategy. As information about the failure of the Glasgow bank was spread by newspapers, it was likely that depositors and shareholders who had higher exposure to newspapers learned more about the details of the failure. Not all contemporary local newspapers were capable of sending journalists to Glasgow to report the failure of the Glasgow bank, because they usually cared more about local businesses while providing local readers with information from the whole country. The costs of traveling were also high for local newspapers. Therefore, it was usual for newspapers to take articles from other newspapers and use the materials in their own

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<sup>21</sup>The characteristics of banks in 1877 are interacted with the year fixed effects between 1878 and 1885 ( $\eta_t, t = 1878, 1879, \dots, 1885$ ). The characteristics of towns are interacted with the year fixed effects between 1874 and 1885 ( $\eta_t, t = 1874, 1879, \dots, 1885$ ).

articles.<sup>22</sup> Exposure to newspapers led to larger negative shocks to the banks with their headquarters in corresponding towns. Therefore, the instrumental variable that I use is the interaction of the exposure to newspapers in September 1878 and the dummy for post-1878,  $IHS(\text{No. of Newspapers}_i) \times 1(\text{Post } 1878_t)$ .  $IHS(\text{No. of Newspapers}_i)$  is the inverse hyperbolic transformation of the number of newspapers in town  $i$  before the collapse of the City of Glasgow Bank in October 1878. The time-invariant impacts of local newspapers in town  $j$  are absorbed by bank fixed effects.

The instrument is based on two assumptions. First, the number of newspapers was not correlated with pre-existing characteristics that had differential impacts on the opening of new offices after 1878. In Table A1, I show the results of balance tests. They show that in towns with more newspapers, banks were more likely to adopt limited liability. Also, banks were more likely to have more partners and higher amounts of paid-in capital. Controlling for pre-existing characteristics does not change the estimation results much, decreasing the coefficients by about 15%. Therefore, I include these control variables in my estimation. The second assumption is that the instrument did not create different trends in the opening of new offices via other channels besides the shocks that banks received between September and December 1878. As local newspapers were published to provide information to local readers, bankers who needed to do business with London and other districts could collect information from other channels that were more efficient in providing the latest information to bankers. It was unlikely that newspapers affected the decisions of bankers to open new offices.

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<sup>22</sup>For example, the *Lancaster Gazette* on October 5th, 1878 mentioned that ‘A noteworthy fact in connection with the bank was that it had more branches than any other Scotch establishment, the total number of these being 133.’. The *Derby Mercury* copied the whole sentence on October 9th, 1878. However, the *Huddersfield Daily Chronicle* on October 5th, 1878 mentioned ‘The City of Glasgow was established in 1839, with its head office in Glasgow, but throughout Scotland, it has branches in all the chief towns, the number, according to a recent return, being 93’. The Huddersfield newspaper must had another information source that provided the wrong number for the bank offices.

## 4 Results

### 4.1 Baseline Estimation

I report baseline estimation results in Table 2. Columns (1) and (2) show the OLS estimation results of equation (2).

In column (1), I include only bank and year fixed effects. In column (2), I include the interaction of pre-shock characteristics of banks and towns and year fixed effects. A one-standard deviation increase in the negative shocks that banks received predicts a 9.0% standard deviation increase in offices. Compared to a bank that experienced a 4.68% drop in its market value,<sup>23</sup> a bank that received a one-standard deviation larger shock (6.63%) would increase the number of offices by about 5.6%.<sup>24</sup>

In columns (3) and (4), I report the IV estimates. In column (3), I include only bank and year fixed effects. In column (4), I include the interaction of bank-level controls before 1878 and year fixed effects. The IV estimates are only about 1.5 times as large as the OLS estimates. This difference is likely to be driven by measurement error, because the relative changes in the market values of banks were affected by noise and also faced friction due to restrictions on share trades. The KP F statistic (Kleibergen and Paap, 2006) in column (3) is about 36.7. Therefore, the concern about a weak instrument is not severe. In columns (5) and (6), I report the first-stage estimation results. Press coverage intensified the negative shocks on the market values of local English joint-stock banks. They suggest that the number of local newspapers explains the shocks that banks received well, because the within groups  $R^2$  is about 0.4.

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<sup>23</sup>the mean of the shocks

<sup>24</sup>I take the coefficient in column (2), -0.0772, in this calculation.  $[\sinh(4.68 + 6.63) - \sinh(4.68)] \times (-0.0772) \approx 0.067$

Table 2: Baseline results

	(1)	(2)	(3)	(4)
	IHS(Office Numbers)			
	OLS		IV	
Shock $\times$ 1(Post-shock)	-0.0649*** (0.0200)	-0.0772** (0.0323)	-0.0926** (0.0418)	-0.107* (0.0605)
Within $R^2$	0.0497	0.150		
KP F			36.70	15.86
LHS SD	1.134	1.134	1.134	1.134
RHS SD	1.315	1.315	1.315	1.315
Standardized $\beta$	-0.0752	-0.0895	-0.107	-0.125
	(5)	(6)	(7)	(8)
	Shock $\times$ 1(Post-shock) First Stage		IHS(Office Numbers) Reduced Form	
IHS(Newspapers) $\times$ 1(Post-shock)	-1.680*** (0.277)	-1.479*** (0.371)	0.156** (0.0613)	0.159* (0.0937)
Within $R^2$	0.439	0.542	0.0444	0.130
Observations	788	788	788	788
Bank and Year Fixed Effects	Yes	Yes	Yes	Yes
Pre-1878 Characteristics $\times$ Year FEs	None	Yes	None	Yes

*Notes:* This table reports baseline estimation results of Eq. (2). Columns (1) and (2) report the OLS estimation results. In column (1), I include bank and year fixed effects. In column (2), I include the interaction of pre-shock characteristics of banks and year fixed effects. Columns (3) and (4) report the IV estimation results. In column (3), I include bank and year fixed effects. In column (4), I include the interaction of pre-shock characteristics of banks and year fixed effects. Columns (5) and (6) report the first-stage estimation results of the 2SLS estimation. Columns (7) and (8) report the reduced form estimation results. Pre-1878 characteristics include the inverse hyperbolic sine of the number of bank offices in 1877, the inverse hyperbolic sine of the number of partners in 1877, the inverse hyperbolic sine of the amount of paid-in capital in 1877, the adoption of unlimited liability in 1877, latitude, longitude, and the share of manufacturing employment in 1861. KP F reports the KP F statistics of the 2SLS estimations. Standard errors clustered at the town level are reported in parentheses. \*\*\*, \*\*, and \* indicate significance at the 1%, 5%, and 10% levels respectively.

$$\text{IHS}(\text{No. of offices}_{i,j,t}) = \beta_0 + \sum_{m=1874, m \neq 1878}^{1885} \beta_{1m} \times \text{IHS}(\text{Shock}_{i,j}) \times 1(\text{Year}_t = m) \quad (3)$$

$$+ x'_{i,j} \times \eta_t + \delta_i + \eta_t + \varepsilon_{i,j,t}$$

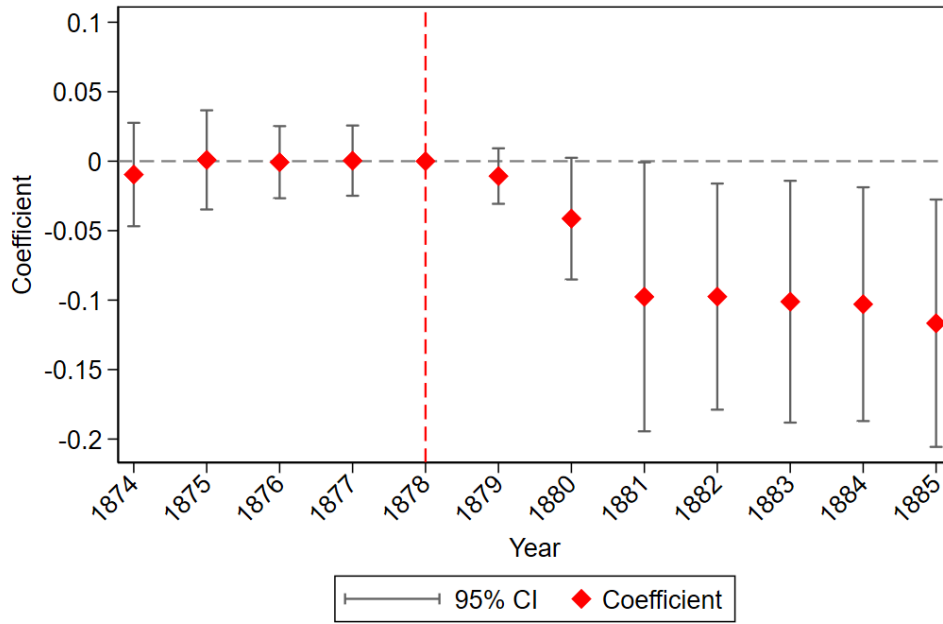
$$\text{IHS}(\text{No. of offices}_{i,j,t}) = \gamma_0 + \sum_{m=1874, m \neq 1878}^{1885} \gamma_{1m} \times \text{IHS}(\text{News}_{i,j}) \times 1(\text{Year}_t = m) \quad (4)$$

$$+ x'_{i,j} \times \eta_t + \delta_i + \eta_t + \varepsilon_{i,j,t}$$

In Figure 2, I report the event study estimation results of equations (3) and (4). In

Figure 2: Event Studies

(a) Shocks and the Number of Bank Offices



(b) Newspapers and the Number of Bank Offices

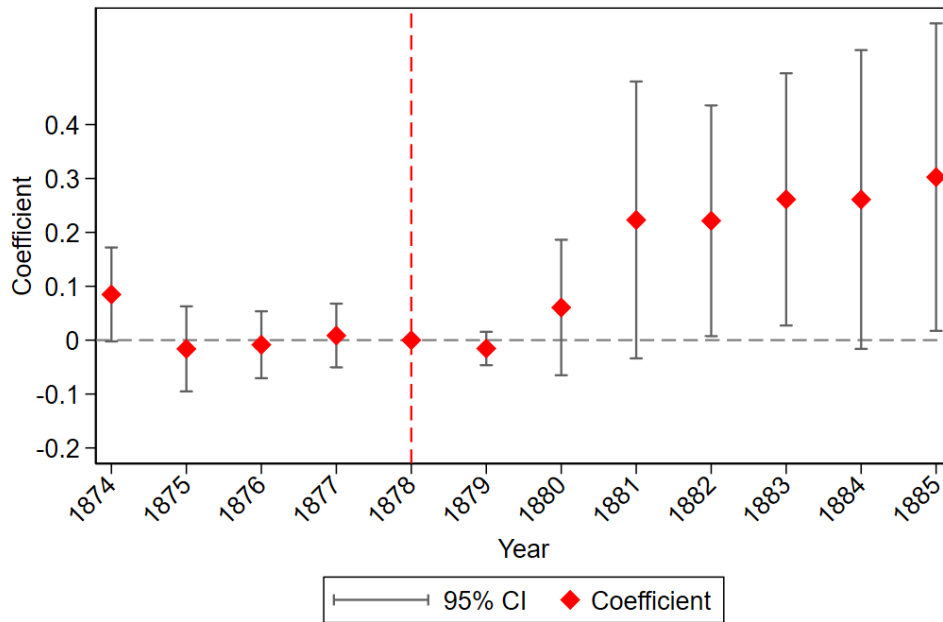


Figure 2a above, I show the relationship between the shocks resulting from the failure of the Glasgow bank and the number of bank offices before and after 1878, the year when the City of Glasgow Bank failed. Before 1878, the trends in the number of offices were similar for banks that received different shocks after the failure of the Glasgow bank. The shocks were uncorrelated with the number of bank offices in 1879. The coefficient for the year 1880 is significantly different from 0 at the 10% level. In Figure 2b below, I show the relationship between the number of newspapers and the number of bank offices before and after 1878. Before 1878, there were no differential changes in the number of bank offices for banks with different exposure to newspapers. However, after 1878, banks whose headquarters were located in towns with more newspapers built more new offices, especially after 1880. Therefore, a larger number of newspapers led to larger shocks that banks received after the failure of the Glasgow bank. Building new offices usually involves the investigation of market potential, choosing premises, and training and allocating staff. Therefore, it is not surprising that it took two to three years for banks to open new offices in response to the shocks.

## 4.2 Robustness Checks

In this section, I test if the results in the baseline estimation are still robust when I use different measures of the shocks that banks received and different transformations of the shocks. I also construct an alternative instrumental variable using the number of general-interest newspapers that reported social news and exclude newspapers with special focus including sports, art, and operas. Two banks with a few offices opened new offices by purchasing other banks with many more offices than themselves.<sup>25</sup> I also show that the results are still robust when I exclude the two banks.

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<sup>25</sup>One is the Birmingham Banking Company. It owned 2 offices and purchased the Stourbridge and Kidderminster Bank which owned 14 offices. The other is Birmingham, Dudley, And District Banking Company, Limited. It owned 9 offices and purchased the Midland Banking Company, Limited which owned 40 offices

### 4.2.1 Different Measures of the Shocks

First, I test the robustness of the estimation results to the measurement of the shocks that banks received during the financial panic. In the baseline estimation, I use the proportional changes in the market values of the stock of banks between the end of September and the end of December in 1878 to measure the shocks that banks received. I use the changes over three months because it took time for shareholders to trade the stocks of banks, especially for banks that adopted unlimited liability. Therefore, the prices of bank stocks might remain the same in October 1878 because no trade was conducted. On the other hand, the longer after the failure of the Glasgow bank, it was more likely that banks acted to deal with the shocks brought about by the sudden shock, especially after the shareholder annual meetings in January and February 1879. The responses of banks will be priced in, making the price decline a bad measure of exposure to the shocks.

In Table A2, I show whether the estimation results are still robust when I use the changes in market values between September and another month after the failure of the Glasgow bank. As the prices of the last conducted business of the month are missing for some observations, I fill in the value using the value in the latest month before this month. In columns (1) to (5), I include bank and year fixed effects. In columns (6) to (10), I also include the interaction of pre-shock bank characteristics and year fixed effects.

In columns (1) and (6), I use the relative changes in the market values of banks between the end of September 1878 and the end of October 1878, just after the failure of the City of Glasgow Bank, to measure the shocks that banks received. Column (1) shows that the drop in the market values of banks within the month that the Glasgow bank failed predicted increases in the number of bank offices after 1878, but the coefficient becomes insignificantly different from 0 in column (6) when I control for pre-1878 characteristics of banks. The weaker correlation between the relative changes in the market values of banks and bank offices was likely due to the stagnation of the stock prices of banks in the first month after the Glasgow bank failed, as the trade of these stocks usually required the approval of directors.



In columns (2) and (7), I use the changes between September and November. They show that banks opened more offices after 1878 if they received large shocks within 2 months after the failure of the Glasgow bank. The coefficients are close to those in columns (1) and (2) in Table 2, as more bank shareholders began to trade the stocks of banks and the stock prices converged to the expected value of bank shares.

In columns (3) and (8), I use the changes between September and the end of the year. They correspond to columns (1) and (2) in Table 2. In columns (4) and (9), I use the changes between September 1878 and the end of January 1879. In columns (5) and (10), I use the changes between September 1878 and the end of February 1879. According to the balance sheets of English banks published in the *Economist*, the annual meetings of the shareholders of banks were usually held in January and February of each year. In 1879, after the New Year, banks held annual meetings, reelected directors, communicated with shareholders, and made important decisions regarding the shocks resulting from the failure of the Glasgow bank.<sup>26</sup> Therefore, it might be harder to capture the shocks that banks received using the market values in January and February of 1879. Banks were able to make major revisions to their strategies during annual meetings and the stock prices will have captured these changes as well, and not only the shocks brought about by the failure of the City of Glasgow Bank.

In Tables A3 and A4, I report the IV estimation results and the first stage estimation results using the same alternative measures of the shocks. In columns (2), (3), (7), and (8) of Table A3, I show that the baseline estimation results are robust when I use the relative changes in the market values of banks between the end of September 1878 and the end of November and December 1878. The corresponding columns in Table A4 suggest that the number of local newspapers explained the changes in the market values of banks well. The within-group R-squared values are above 0.4. The results in columns (1), (4), (6), and (9) show that the results are less robust when I include the pre-1878 controls and they might

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<sup>26</sup>Based on the description of the annual meeting of the Wilts and Dorset Banking Company recorded in the article titled ‘Annual meeting of the Wilts and Dorset Banking Company’ in the *Weymouth Telegram* published on February 7th, 1879. The scanned newspaper can be accessed at <https://www.britishnewspaperarchive.co.uk/viewer/bl/0002981/18790207/091/0010> (subscription required)

exhaust degrees of freedom and lead to larger standard errors. Columns (5) and (10) show that the IV estimates are insignificantly different from 0 when I measure the shocks using the relative change in the market values of banks between the end of September 1878 and the end of February 1879. Columns (5) and (10) in Table A4 suggest that it was likely that the number of newspapers was not good at explaining the changes in the market values of banks after February 1879.

#### 4.2.2 Alternative Transformations of the Shocks and an Alternative Instrument

In Table A5, I test whether the baseline estimation results are robust when I use different transformations to the relative changes in the market values of banks. First, I test if the results were driven by whether the market value of the bank dropped after the failure of the Glasgow bank. In columns (1) to (4), the independent variable is the interaction of a dummy measuring whether the market values of the bank dropped between September and December 1878 and a dummy for post-1878 years. In columns (1) and (2), I report OLS estimates. They suggest that banks that suffered from negative shocks after October 1878 increased the number of their bank offices by about 20% on average. In columns (3) and (4), I report the IV estimates. The coefficients range around 0.30, about 1.5 times as large as the OLS estimates. Therefore, receiving negative shocks led banks to increase the number of branches after 1878.

In columns (5) to (8), the independent variable is the interaction of a dummy measuring whether a bank lost more than 10% of its market value during the panic.<sup>27</sup> In columns (5) and (6), I report OLS estimates. They suggest that banks that suffered from large negative shocks after October 1878 increased the number of their bank offices by about 18% on average. In columns (7) and (8), I report the IV estimates. The results are still robust, showing that receiving large negative shocks led to the opening of more bank offices.

There exist concerns about the transformation of continuous variables when they include

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<sup>27</sup>Only 12 out of 67 banks satisfied this condition.

values equal to zero (Chen and Roth, 2023). In the baseline estimation, I use the inverse hyperbolic sine transformation of the relative changes in the market values of banks because the market values of about half of the banks did not change after the Glasgow bank failed. In columns (9) and (10), I add a control that captures the stagnation of bank share prices between September 1878 and December 1878. The variable is the interaction of a dummy measuring whether the market values of the bank remained unchanged and the dummy for post-1878 years. For banks whose share prices remained unchanged between September and December 1878, it was likely that they opened fewer offices after 1878, but the coefficients are not significantly different from 0. Columns (9) and (10) show that the results are still robust and the coefficients are significantly different from zero when I only focus on the banks that experienced variations in their stock prices within 3 months after the failure of the Glasgow bank. They suggest that the intensive margins of the impacts of banks also existed. The banks that received large shocks after October 1878 built more offices after 1878.

In columns (11) and (12), I measure the shocks that banks received by ranking the drops in their market values between September and December 1878. This method follows Landry et al. (2018), because the trust of depositors in a bank was also affected by its comparison with other banks across the country. The bank that had the largest drop in its market value was the Manchester And Salford Bank, which lost 25.6% of its market value in three months after the Glasgow bank failed. All banks that had no changes in the market values are ranked 35. In columns (11) and (12), the independent variable that I use is the interaction of the inverse hyperbolic sine transformation of the ranks of the relative drop in market values that banks experienced and the post-1878 dummy. Results in the two columns show that banks that had smaller numbers of ranks increased more offices after 1878. These were the banks that received larger relative drops in their market values, suggesting that the baseline estimation results are robust to different measures.

### 4.2.3 Alternative Instrument based on General-Interest Newspapers

In the baseline estimation, I build the instrument using the total number of newspapers in the towns where the headquarters of banks were located. There were some newspapers with specific focuses on various topics including music, sports, and overseas trade. It was likely that these newspapers reported very little or nothing about the City of Glasgow Bank because banks were unrelated to their specific topics.

In Table A6, I build an alternative instrument using the number of general-interest newspapers that reported commercial and social news. Columns (1) and (2) are the same as columns (3) and (4) in Table 2. In columns (3) and (4), I use the alternative instrument built using the number of general-interest newspapers. The IV estimation results are similar to those in the baseline estimation. In columns (5) and (6), I report the reduced-form estimation results using the baseline instrumental variable. They suggest that in the towns with more local newspapers before October 1878, banks received larger negative shocks after the failure of the Glasgow bank. In columns (7) and (8), I report the reduced-form estimation results using the alternative instrument. The results are similar to columns (5) and (6), showing that the results are robust when I use the number of general-interest newspapers to build the instrument.

I also do a placebo test showing that unobserved factors that affected the entry of newspapers did not create differential impacts on the opening of bank offices. In Table A7, I test if the number of newspapers established within 10 years after the panic predicts the opening of new offices. I construct an instrument based on the number of newspapers established between 1879 and 1888. If some unobserved factors led to more newspapers and larger negative shocks, the impacts would be observed also among newspapers established after 1878. Columns (1) and (2) report the IV estimates, suggesting that the newspapers established after 1878 did not lead to more bank offices. Columns (3) and (4) show that the number of newspapers established after 1878 was uncorrelated with the changes in the market value of banks in 1878. The newspapers established after 1878 predicted the shocks that banks

received poorly. The within-group R squared value in column (3) is very small. Columns (5) and (6) show the reduced-form OLS estimates. The number of newspapers established after 1878 does not predict the opening of bank offices.

#### 4.2.4 Excluding Small Banks that Merged Large Banks

I show in the baseline estimation that banks that received larger shocks after the failure of the Glasgow bank increased the numbers of their bank offices more after 1878. This might have been driven by two outliers that greatly increased the number of their offices by amalgamating banks with many more offices than they possessed. In the sample, two Birmingham banks realized large increases in the number of their offices after 1878. In 1880, Birmingham Banking Company, which owned 2 offices and £160,000 of paid-in capital, purchased the Stourbridge and Kidderminster Bank. The Stourbridge bank owned 14 offices and £100,000 of paid-in capital. In 1881, Birmingham, Dudley, And District Banking Company, Limited, which owned 9 offices and £285,000 of paid-in capital, purchased the Midland Banking Company, Limited. The Midland Banking Company owned 40 offices and £255,000 of paid-in capital. Therefore, I drop the observations of the two banks after they performed their amalgamations.

The estimation results are shown in Table A8. The table is organized as Table 2. In columns (1) and (2), I report OLS estimates. They suggest that the estimates are still robust when I exclude the two banks that might have led to downward changes in the estimates. The estimates shrink by about 30% but are still significantly different from 0. Columns (3) and (4) report the IV estimates. They help alleviate concerns about the impacts of outliers. Columns (5) and (6) report the first-stage results, suggesting that higher numbers of newspapers led to larger negative shocks to the banks.

## 5 Mechanisms

### 5.1 Concerns about Public Confidence and Contemporary Banking Practices

Why did banks branch? According to contemporary bankers, branch banks provided better security for depositors because they had larger amounts of capital and all branches could use the funds that the bank owned (Gilbart and Michie, 1882, p.121-123). Therefore, it was likely that banks opened new offices to increase public confidence after a financial panic.

For depositors, large banks were more credible than small banks. For bankers, opening new offices helped make the bank more stable. Therefore, it was likely that small banks opened relatively more new offices than large banks. I analyze whether the impacts of the shocks on the number of offices were driven by smaller banks. In heterogeneity analyses, I find that the baseline results are driven by banks with a below-median number of offices before the failure of the Glasgow bank than banks with an above-median number of offices in 1877.

Smaller banks were also more vulnerable to financial panics than larger banks, because they were more likely to suffer from liquidity constraints. Illiquid assets led to the failure of the City of Glasgow Bank. The City of Glasgow Bank invested in American railways (Alborn, 2003, p.133-137) and land in Australia and New Zealand (Button et al., 2015). Banks in England suffered from liquidity constraints due to the loss in deposits after the failure of the City of Glasgow Bank and learned the importance of liquidity. After 1878, the asset portfolios of joint-stock banks in England and Wales turned more liquid, with the ratio of liquid assets rising from 31% in 1877 to more than 40% in the early 1880s (Collins and Baker, 2003). I find that banks with a below-median number of offices suffered from larger drops in cash after 1878 than banks with an above-median number of offices in 1877. Therefore, it was likely that the opening of new offices by banks with fewer offices was driven

by the drop in liquidity after the failure of the Glasgow Bank.

Political parties used newspapers to spread their views in Victorian Britain. In the second half of the 19th century, Conservative newspapers managed to spread their views in part by appealing to nationalism (Roberts, 2006). Therefore, English banks could utilize the nationalism spread by Conservative newspapers when the panic resulted from a Scottish bank. English banks emphasized their English traditional banking practices and identities to increase the confidence of the public in them. In towns with lower exposure to Conservative newspapers, banks built new offices and increased their capital to increase public confidence. In towns with higher exposure to Conservative newspapers, banks substituted emphasis on Englishness for opening new offices and increasing capital to increase public confidence. Qualitative evidence shows that banks emphasize their English identity by highlighting their historical connection with shareholders or referring to national heroes, like the Duke of Wellington, to appeal for shareholders' sustained trust.

In response to the criticism of banks with multiple branches,<sup>28</sup> English bankers tried to blame Scottish characteristics for the failure of the Glasgow bank to get rid of the blame on branching (Alborn, 2003, p.133-137). Therefore, in towns with lower exposure to Conservative newspapers, the banks with more Scottish directors in 1877 were less likely to increase bank offices because they were perceived as less secure than banks with fewer Scottish directors. In towns with a below-median ratio of Conservative newspapers, I find that the banks with more Scottish directors opened fewer new offices and increased more subscribed capital.

I also rule out alternative mechanisms related to public confidence in banks. The first is related to the amount of capital. The number of bank offices was positively correlated with the amount of paid-in capital. I do heterogeneity analyses to test if the impacts were driven by banks with fewer offices or banks with a lower amount of paid-in capital. I do not observe differential responses by banks with different amounts of paid-in capital in 1877. It was the

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<sup>28</sup>Bankers who insisted on the tradition of operating closely with the local communities, like William Newmarch, the manager of a private bank, Glyns, Mills & Co., argued that the failure of the Glasgow bank was due to the weakness in banks with multiple branches (Alborn, 2003, p.133-137). Therefore, banks should not build offices far away from their headquarters.

small number of offices but not the small amount of paid-in capital that led to the loss of liquidity and drove the opening of new offices.

Limited liability might encourage shareholders to approve the opening of more offices. I find no evidence that banks that adopted unlimited liability by 1877, before the crisis, responded differently from banks that adopted limited liability by 1877. What I find is coherent with the findings of Acheson and Turner (2008) that shareholders did not perceive banks that adopted unlimited liability differently from banks that adopted limited liability.

## 5.2 Heterogeneity Analysis: Banks with Larger and Smaller Numbers of Offices

*PAID-UP CAPITAL AND RESERVE FUND.*— *There have been large additions made to paid-up capital and the reserve fund since 1874. When we come to compare the proprietors' funds with the liabilities to the public, we shall see how much more security the public had in 1883 over 1874, and how the means of the banks have been strengthened* (Dick, 1884, p.328).

According to contemporary bankers, banks tried to provide more security to their depositors after 1878. Banks with fewer offices were perceived as less secure than banks with more offices. Therefore, banks with fewer offices in 1877 were likely to open more offices. They were also more likely to increase the amount of capital to increase the confidence of depositors. The estimation results are shown in Panel A in Table 3.

In Panel A in Table 3, I first test whether banks opened more offices to provide more security to depositors. Columns (1) and (2) are the same as columns (1) and (2) in Table 2, showing that the larger the shocks that banks received, the more offices banks opened after 1878.

If banks opened new offices to increase public confidence, it was likely that they also increased capital, which served the same purpose as opening offices. Subscribed capital was



Table 3: The Impacts of the Shocks on Bank Offices and Capital

Panel A Impacts of the shocks	(1)	(2)	(3)	(4)	(5)	(6)
	IHS(Offices)		IHS(Subscribed Capital)		IHS(Paid-in Capital)	
Shock $\times$ 1(Post-shock)	-0.0649*** (0.0200)	-0.0772** (0.0323)	-0.0408 (0.0247)	-0.0361 (0.0245)	-0.00567 (0.0162)	-0.0130 (0.0144)
Observations	788	788	445	445	445	445
Within $R^2$	0.0497	0.150	0.0109	0.394	0.00166	0.242
Panel B: Heterogeneity Analyses	(7)	(8)	(9)	(10)	(11)	(12)
	IHS(Offices)		IHS(Subscribed Capital)		IHS(Paid-in Capital)	
Shock $\times$ 1(Post-shock)	-0.143*** (0.0433)	-0.173*** (0.0404)	-0.0908*** (0.0283)	-0.0823 (0.0527)	-0.0305 (0.0276)	-0.0473** (0.0213)
Shock $\times$ 1(Post-shock) $\times$ 1877 Larger	0.118*** (0.0370)	0.139*** (0.0320)	0.0785* (0.0419)	0.0677 (0.0580)	0.0367 (0.0240)	0.0495*** (0.0177)
Observations	788	788	445	445	445	445
Within $R^2$	0.0866	0.194	0.0246	0.399	0.0166	0.264
p-value	0.217	0.268	0.684	0.570	0.665	0.870
Bank & Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Pre-1878 Characteristics $\times$ Year FEs	None	Yes	None	Yes	None	Yes

*Notes:* Panel A in this table reports the impacts of the shocks resulting from the failure of the City of Glasgow Bank on bank offices and capital. Panel B in this table reports the heterogeneous impacts of the shocks on banks with a below-median number of offices and an above-median number of bank offices in 1877. In columns (1) and (2), I report the impacts of the shocks on the number of offices. They are the same as columns (1) and (2) in Table 2. In columns (3) and (4), I report the impacts of the shocks on the amount of subscribed capital of banks. In columns (5) and (6), I report the impacts of the shocks on the amount of paid-in capital of banks. Panel B in this table reports the heterogeneous impacts of the shocks in 1878 on bank offices and capital for banks with an above-median number of offices in 1877 and banks with a below-median number of offices in 1877. In columns (7) and (8), I report the heterogeneous impacts of the shocks on the number of offices for banks with a below-median number of offices and those with an above-median number of offices in 1877. In columns (9) and (10), I report the heterogeneous impacts of the shocks on the amount of subscribed capital for banks with a below-median number of offices and those with an above-median number of offices in 1877. In columns (11) and (12), I report the heterogeneous impacts of the shocks on the amount of paid-in capital for banks with a below-median number of offices and those with an above-median number of offices in 1877. The p-value row shows the p-values of comparing the sum of the coefficient for the independent variable and the coefficient for the interaction of the independent variable and banks having an above-median number of offices in 1877 against 0. The coefficients for the interaction term of the dummy of post-shock and the dummy of having an above-median number of bank offices are not reported in the table. The sum shows the impacts of the shocks on banks with an above-median number of offices. Standard errors clustered at the town level are reported in parentheses. \*\*\*, \*\*, and \* indicate significance at the 1%, 5%, and 10% levels respectively.

the amount of capital for which shareholders were liable, equaling the sum of paid-in capital and uncalled capital (Turner, 2014, p.125). The higher the subscribed capital was, the less likely that depositors would suffer from loss when the bank went bankrupt. Columns (3) and (4) show that banks increased their subscribed capital in response to the shocks. As not all banks reported their subscribed capital, especially banks that adopted unlimited liability, I use a consistent subsample of banks that reported subscribed capital before 1878 for the analyses of capital structure. Columns (5) and (6) show the estimation results for paid-in capital, the amount of money that shareholders paid to the banks. The results show that banks did not call in more funds to increase their paid-in capital after receiving the shocks.

Therefore, it was likely that the negative shocks resulting from the failure of the City of Glasgow Bank increased the number of offices and the amounts of subscribed capital to increase the confidence of depositors in them. It might be hard to increase the amount of paid-in capital in a short time because it will decrease the expected returns of holding bank shares and lead to the exit of shareholders.

Next, I test whether the changes in offices were different for banks with different numbers of offices. The impacts of the shocks on bank offices and bank capital would be smaller for banks with an above-median number of offices before 1878 because depositors had higher confidence in them than in banks with a below-median number of offices.

In Panel B in Table 3, I show that banks with an above-median number of offices reacted to the failure of the Glasgow bank differentially from banks with a below-median number of offices. The median number of offices was 5 in 1877 for the banks in my sample. Columns (7) and (8) show that banks with an above-median number of offices reacted much less than banks with a below-median number of offices. For banks with more offices, the coefficients of the shocks are the sums of the coefficients for the independent variable and the coefficients for the interaction term of the independent variable and the dummy for having an above-median number of offices. Based on the p-values reported in Table 3, the coefficients for larger banks are negative in columns (7) to (10), but not significantly different from 0. The coefficients for larger banks are negative in columns (11) to (12), but not significantly different from 0. The increases in the number of bank offices were mainly driven by banks with a below-median number of offices. Columns (9) and (10) show that the increases in the amounts of subscribed capital were also driven by banks with a below-median number of offices. Column (12) suggests that banks with a below-median number of offices might also increase paid-in capital to increase the confidence of depositors in them.

Therefore, estimation results in Table 3 show that banks with a below-median number of offices tried to build more new offices and increase subscribed capital to make themselves look more stable and increase the confidence of depositors after the failure of the Glasgow

bank. Banks mainly increased the uncalled capital that they promised to their depositors but not paid-in capital, the increase of which would make bank stocks less attractive to investors.

### 5.3 Caution for Liquidity

As building new offices is an important method for banks to increase deposits (Aguirregabiria et al., 2016), the changes in deposits and liquid assets resulting from the withdrawal of deposits might be a reason leading to the changes in bank offices after the financial panic. Therefore, I collect the amount of deposits, liabilities, and cash of banks from the balance sheets published in the *Economist*.

In a period when the United Kingdom adhered to the gold standard, banks focused on the cash that they held, because there was not abundant short-term public debt that could be traded to cash in a short period (Bank of England, 1962, p.251). As English banks increased the liquidity of their assets after the failure of the City of Glasgow Bank, concerns about liquidity might drive banks to increase the number of their offices and make themselves more stable. As not all banks published balance sheets, I use a subsample of banks that reported information about their deposits, liabilities, cash, and liquid assets.

I focus on the amount of cash that banks held and the cash ratio of banks, both of which could measure the liquidity of banks. The cash ratio is the ratio of cash, including bank notes, coins, and Bank of England balances, to total liabilities. In Panel A of Table 4, I show the differential impacts of the shocks on banks with different numbers of offices before 1878. Columns (1) and (2) show that banks with a below-median number of offices suffered from larger losses in cash if they received larger negative shocks during the financial panic. Column (3) shows that, besides the amount of cash, smaller banks also suffered from drops in their cash ratio. There is no evidence that banks with an above-median number of offices had lower cash ratios due to the failure of the Glasgow bank. Smaller banks faced more severe liquidity shocks during the financial panic than banks with an above-median

Table 4: The Heterogeneous Impacts of the Shocks on Cash and Liabilities

Panel A: Cash	(1)	(2)	(3)	(4)
	IHS(Cash)		IHS(Cash Ratio)	
Shock $\times$ 1(Post-shock)	0.104*** (0.0231)	0.0604 (0.0691)	0.0152** (0.00629)	0.0140 (0.0199)
Shock $\times$ 1(Post-shock) $\times$ 1877 Larger	-0.131*** (0.0273)	-0.0813 (0.0717)	-0.0167 (0.0112)	-0.0145 (0.0212)
Within $R^2$	0.0205	0.312	0.0257	0.270
Panel B: Liabilities	(5)	(6)	(7)	(8)
	IHS(Liabilities)		IHS(Deposits)	
Shock $\times$ 1(Post-shock)	0.0204 (0.0641)	0.0227 (0.0745)	0.0370 (0.0648)	0.0324 (0.0748)
Shock $\times$ 1(Post-shock) $\times$ 1877 Larger	-0.0387 (0.0682)	-0.0155 (0.0727)	-0.0550 (0.0697)	-0.0255 (0.0745)
Within $R^2$	0.0175	0.396	0.0221	0.413
Panel C: Offices	(5)	(6)	(7)	(8)
	IHS(Offices)			
Shock $\times$ 1(Post-shock)	-0.0490*** (0.0160)	-0.0628 (0.0372)	-0.116*** (0.0256)	-0.171** (0.0779)
Shock $\times$ 1(Post-shock) $\times$ 1877 Larger			0.107*** (0.0263)	0.145** (0.0666)
Observations	363	363	363	363
Within $R^2$	0.0344	0.260	0.0738	0.300
Bank and Year Fixed Effects	Yes	Yes	Yes	Yes
Pre-1878 Characteristics $\times$ Year FEs	None	Yes	None	Yes

*Notes:* This table reports the differential impacts of the financial panic on banks with an above-median number of offices in 1877 and those with a below-median number of offices before the panic. In Panel A, I show the estimation results for the liabilities and deposits of banks. Columns (1) and (2) report the OLS estimation results for the inverse hyperbolic sine transformation of liabilities. Columns (3) and (4) report the OLS estimation results for the inverse hyperbolic sine transformation of deposits. In Panel B, I report results about cash. Columns (5) and (6) report the OLS estimation results for the inverse hyperbolic sine transformation of cash held in the banks. Columns (7) and (8) report the OLS estimation results for the inverse hyperbolic sine transformation of cash ratio, an important measurement of the liquidity of banks. In Panel C, I show that the results also apply to the number of bank offices and the holding of liquid assets. Columns (9) and (10) report the OLS estimation results for the inverse hyperbolic sine transformation of the number of bank offices. Columns (11) and (12) report the OLS estimation results for the inverse hyperbolic sine transformation of liquid assets, including cash, bills of discounting, government debts, and company stocks. \*\*\*, \*\*, and \* indicate significance at the 1%, 5%, and 10% levels respectively.

number of banks. Coefficients in column (4) are similar to those in column (3) but are not significantly different from 0. This might be due to large standard errors resulting from the small sample size of banks that reported balance sheets.

The cash that banks held depended on the changes in deposits and the sales of other assets to collect cash. There is no comprehensive information about the sales of assets to collect cash due to the lack of historical bank archives. Therefore, I test whether the loss in deposits during the shocks was a mechanism through which the financial panic led to the opening of new bank offices. In columns (5) to (8), I test whether the shocks affected the

deposits and liabilities of banks. Deposits are the funds that depositors place with banks. Besides deposits, liabilities of banks also include the acceptances of banks,<sup>29</sup> the notes that banks issue,<sup>30</sup> the bills that banks need to redeem,<sup>31</sup> and rebates that banks need to pay.<sup>32</sup> The estimation results are reported in Panel B of Table 5.

If larger negative shocks led to a larger drop in deposits for smaller banks, the loss of deposits was likely to be a mechanism driving the opening of new offices. However, columns (5) to (8) show that there is no evidence that the shocks resulting from the failure of the Glasgow bank created differential shocks to the deposits and liabilities of banks with different numbers of offices in 1877. Therefore, the increase in the number of offices was unlikely due to the drop in deposits. The drop in liquidity of banks with a below-median number of offices was likely due to the difficulties of smaller banks in selling other assets to collect cash when they were affected by the panic.

As the subsample that I use in Table 4 includes only banks that reported balance sheets, I test whether the impacts of the shocks on the number of bank offices are robust in the subsample in Table 4. In columns (9) to (12), I show that the results reported in columns (1), (2), (7), and (8) of Table 3 are still robust when I use the subsample of banks that reported balance sheets. In the subsample in Table 4, the opening of new bank offices was driven by banks with a below-median number of offices. The results suggest that the drop in liquidity might be one reason leading to the opening of new bank offices.

Therefore, combining the analyses in this section, I find that the increases in the number of bank offices after the financial panic were mainly driven by the banks with a below-median number of branches. It was likely due to the loss of cash smaller banks held and the drop in their liquidity after the failure of the City of Glasgow Bank. Compared with small banks,

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<sup>29</sup>Acceptances are a tool that merchants use for trade. The bank promises to pay a sum of money to the payee at a specific date and then take the sum of money from the account of the payer.

<sup>30</sup>English banks could distribute their own banknotes. The holders of the banknotes could ask for gold or the Bank of England notes at the bank.

<sup>31</sup>Banks discounted bills for merchants and industrialists. They usually rediscount the bills in the London money market after endorsing the bills.

<sup>32</sup>Rebates were recorded in the accounts of the clients and banks need to pay to the corresponding client when required.

large banks were less affected by the negative shocks brought about by the failure. After the panic was over, the banks with a below-median number of branches tried to make the banks more stable and credible by increasing the number of bank offices and the amount of subscribed capital.

## 5.4 Emphasis on Englishness: Nationalism and Conservative Newspapers

In the previous sections, I have shown that English banks opened new offices and increased subscribed capital to increase the confidence of depositors and shareholders. This might be due to the loss of liquidity after the failure of the Glasgow bank. Facing the criticism about branch banking, English bankers tried to blame Scottish characteristics for the failure of the Glasgow bank to avoid losing public confidence (Alborn, 2003, p.133-137). An important step they took was to turn from unlimited liability to limited liability, especially the combination of unlimited liability and shareholders who were not able to monitor the banks. By 1877, 24 out of the 67 English banks in my sample had adopted limited liability. while none of the 12 Scottish banks had adopted limited liability.

In the 19th century, local newspapers were an important source of information for local readers (Williams, 2010) and might affect the strategies that banks adopted to increase the confidence of the public. The political attitudes of English newspapers could be categorized into Conservative,<sup>33</sup> Liberal,<sup>34</sup> and neutral.<sup>35</sup> The Conservative Party began to spread the views and principles of the party through publishing local newspapers in the 19th century and accelerated in the 1860s (Roberts, 2006, 2007), but they were behind the Liberal Party in

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<sup>33</sup>They include newspapers that adopted the perspectives of the Conservative Party, newspapers that were neutral but inclined to the views of the Conservative Party, and a newspaper that included both the views of the Conservative and the Liberal Party

<sup>34</sup>They include newspapers that adopted the perspectives of the Liberal Party, newspapers that were neutral but inclined to the views of the Liberal Party, newspapers that adopted the views of the Liberal Party and the Unionists, and a newspaper that adopted both the views of the Conservative and the Liberal Party

<sup>35</sup>The newspapers that declared to be independent, neutral, or did not declare any political attitudes.

utilizing newspapers to spread their views. In a period when liberalism was dominating the political culture (Colls, 2014, p.54), there were 143 newspapers in the 35 towns that housed the headquarters of joint-stock banks in my sample, 65 newspapers affiliated with the Liberal Party, and only 37 affiliated with the Conservative Party.<sup>36</sup> One obvious difference between the Conservative Party and the Liberal Party was nationalism (Cunningham, 2014), which was connected with an emphasis on England.

When reconstructing the confidence of depositors and shareholders in banks, one choice was to choose appropriate banking practices, including opening offices, adding reserves and capital, possessing more liquid assets, adopting limited liability, and hiring external credible auditors. Another choice was to emphasize their characteristics as English bankers, which were different from those of Scottish bankers, so the public could trust them.

One method to build the confidence of the public was to revisit the old English tradition of banks being closely connected with the local community. Scottish banks built offices all over Scotland to collect deposits (Alborn, 2003, p.130-132). The wide geographic coverage made it hard for shareholders of Scottish banks to monitor bank operations. The shareholders of English banks lived near bank offices (Turner, 2014, p.109-112) and it was, therefore, easier for them to monitor the operations of banks.

During the annual meeting of shareholders of the Cumberland Union Bank, the chairman tried to separate the bank from the City of Glasgow Bank by emphasizing its role as an English bank. He complained that the bank was disadvantaged as an English bank near Scottish banks due to different legal restrictions.<sup>37</sup> The chairman claimed that the failure of the City of Glasgow Bank was due to the lack of reserve funds and regular inspections and audits.<sup>38</sup> In comparison, the Cumberland Union Bank stuck to the traditions of English

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<sup>36</sup>Calculated based on the data that I collect from the 1895 *Newspaper Press Directory* and the 1878 political orientation data provided by Beelen et al. (2023).

<sup>37</sup>'There was one other point connected with that failure which may perhaps lead to some alteration in the law regarding the issue of bank notes; for as that law at present stands, it gives, they thought, an unfair advantage over English banks to our neighbours across the Border. ...the power Scotch banks have to issue notes to and of any amount, ... directors would gladly welcome any reforms in the laws of banking which may tend to increase the soundness of the business in any way, and so give confidence to the public.'

<sup>38</sup>Based on the news report titled 'Local Bank Meetings – Cumberland Union Bank' in the *Carlisle Express*

community banks. He highlighted that the directors kept tight control over the accounts to keep shareholders safe, especially in the last three months of 1878 after the failure of the Glasgow Bank, despite the development of the bank from a small bank with 6 offices in 1849 to a large bank with 22 offices and a wide geographical distribution in 1879.

Another method was to refer to national heroes and Christian traditions. This could be seen in the example of the Wilts and Dorset Banking Company.<sup>39</sup> The chairman told shareholders that the bank prepared a reserve of £800,000, so it was not affected by the failure of the Glasgow Bank. The chairman used metaphors to call for the confidence of shareholders in the bank. He first turned to the Duke of Wellington,<sup>40</sup> a national hero, to request support from the shareholders and received an enthusiastic response.<sup>41</sup> Then the chairman turned to traditional Christian family values to emphasize the duties of directors and shareholders.<sup>42</sup> In the end, the chairman again appealed for the trust of shareholders.<sup>43</sup> The speech of the chairman of the bank was published in newspapers and could be easily accessed by middle-class readers.

#### 5.4.1 Substituting Nationalism for Branching

It was likely that the emphasis on English characteristics worked better in towns with higher exposure to nationalism advertised by Conservative newspapers. Therefore, in towns

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*and Examiner* published on February 8th, 1879 and scanned by the British Newspaper Archive. The article can be accessed at <https://www.britishnewspaperarchive.co.uk/viewer/bl/0001875/18790208/083/0006> (subscription needed).

<sup>39</sup>Based on the article titled ‘Annual meeting of the Wilts and Dorset Banking Company’ in the *Weymouth Telegram* published on February 7th, 1879. The scanned newspaper can be accessed at <https://www.britishnewspaperarchive.co.uk/viewer/bl/0002981/18790207/091/0010> (subscription required)

<sup>40</sup>‘The Duke (of Wellington), when in Opposition, was asked to oppose the Government on some trivial question and turn them out. His reply was, "No, the question is one on which we are bound to support the Executive."’

<sup>41</sup>‘He asked them to apply that saying to the case of their own Directors, and to ensure whether it was consistent with their shareholders’ interests at all times and in all seasons! (Applause)’

<sup>42</sup>‘... it would be well for married men and their wives to read the marriage service again now and then, in order to remind them of their duties and obligations:-(laughter)- and so in this case he would advise every shareholder present to read carefully ... as to the duties and responsibilities of Bank Directors.’

<sup>43</sup>‘He only hoped that the shareholders would extend to the existing Directors, as well as to the present General Manager and Assistant Manager the same full degree of confidence which they had hitherto been in the habit of reposing in them.’



Table 5: Subsample Analyses: Different Exposure to Conservative Newspapers

Panel A: Subsample Baseline	(1)	(2)	(3)	(4)
	IHS(Offices)			
Shock $\times$ 1(Post-shock)	-0.0767*** (0.0120)	-0.0790 (0.0488)	-0.0958** (0.0340)	-0.0810 (0.0543)
Within $R^2$	0.100	0.0507	0.285	0.191
Panel B: Heterogeneity: Scottish Directors	(5)	(6)	(7)	(8)
Shock $\times$ 1(Post-shock)	-0.148*** (0.0251)	-0.0699 (0.0497)	-0.166*** (0.0326)	-0.0770 (0.0530)
Shock $\times$ 1(Post-shock) $\times$ More Scottish	0.0899** (0.0347)	-0.0342 (0.0611)	0.0990** (0.0434)	-0.0343 (0.0659)
Within $R^2$	0.142	0.0698	0.322	0.207
p-value	0.0103	0.1397	0.0780	0.1894
Observations	361	427	361	427
Bank and Year Fixed Effects	Yes	Yes	Yes	Yes
Exposure to Conservative News	Lower	Higher	Lower	Higher
Pre-1878 Characteristics $\times$ Year Fixed Effects	None	None	Yes	Yes

*Notes:* Columns (1) to (4) show the heterogeneity analyses about the banks that were near Glasgow and those that were far away from Glasgow. The threshold in columns (1) and (2) is the median of the distances to Glasgow. The threshold in columns (3) and (4) is the 75% percentile of the distances to Glasgow. Columns (5) to (8) report the reduced-form estimation results of Eq. (2) using different instruments. In columns (5) and (6), I use the number of newspapers that held the views of the pro-Conservatives to build the instrument. The newspapers include those that held the views of Conservatives and were neutral but inclined to the Conservatives. In columns (7) and (8), I use the number of newspapers that held the views of the pro-Liberals to build the instrument. The newspapers include those that held the views of Liberals and were neutral but inclined to the Liberals. Time-invariant pre-shock controls include the number of bank offices, the number of partners, and the adoption of unlimited liability in 1877. Standard errors clustered at the town level are reported in parentheses. \*\*\*, \*\*, and \* indicate significance at the 1%, 5%, and 10% levels respectively.

with more Conservative newspapers, bankers could substitute highlighting Englishness for building new offices and adding capital to increase public confidence. In Table 5, I categorize banks into two groups according to the coverage of Conservative newspapers in 1877 in the towns where their headquarters were located. One subsample corresponds to towns with an above-median proportion of Conservative newspapers and the other corresponds to towns with a below-median proportion of Conservative newspapers. The median ratio of Conservative newspapers in a town was 20%. Other papers were usually either independent and neutral or Liberal newspapers. Very few adopted radical views.

In Panel A, I show the responses of banks to the shocks resulting from the failure of the Glasgow bank. Columns (1) and (3) show the estimation for the subsample with fewer Conservative newspapers and columns (2) and (4) show the estimation for the subsample with more Conservative newspapers. I control for bank and year fixed effects in columns

(1) and (2), and control for the interaction of pre-1878 characteristics with year fixed effects in columns (3) and (4). Column (1) shows that banks with lower exposure to Conservative newspapers opened more offices after receiving larger shocks after the failure of the Glasgow bank. The coefficient in column (2) is as large as that in column (1), but insignificantly different from 0. The results are similar in columns (3) and (4). The differences between the standard errors in two subsamples might be due to the omitted variable, the emphasis on the English identity of banks, which will lead to larger standard errors in the subsample with stronger exposure to Conservative newspapers.

The failure of the City of Glasgow Bank was the failure of a Scottish bank and it was among the banks that owned the largest number of offices. Scottish bankers were invited to England to serve as directors because they possessed more knowledge about branch banking than English bankers. Therefore, English banks were likely to be affected by the proportion of Scottish directors when they made decisions to open new offices. However, by emphasizing the identity of being English and staying close to local communities, English banks could rule out the impacts of Scottish directors, because they were regulated by the English practices within banks.

In Panel B, I test whether banks in two different subsamples reacted differentially to the shocks when they possessed different proportions of Scottish directors in 1877 before the shocks. The information on the surnames of directors is collected from the *The Stock Exchange Year-book 1878*. Then I search for the origins of the surnames in the *Concise Oxford Dictionary of Family Names in Britain* and combine other sources<sup>44</sup> to decide if a surname has Scottish origins. I define a bank as more Scottish if the proportion of directors with a surname with Scottish origins in a bank was above 20%, the median proportion. Columns (5) and (7) show the results for the subsample with lower exposure to Conservative newspapers. Columns (6) and (8) show the results for the subsample with higher exposure to Conservative newspapers. I control for bank and year fixed effects in columns (5) and

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<sup>44</sup>I also search surnames that cannot be found in the dictionary on Internet websites that focus on family trees and surnames, including Findmypast and Ancestry.

(6), and include the interaction of pre-1878 characteristics and year fixed effects in columns (7) and (8). The results in columns (5) and (7) suggest that the proportion of Scottish directors in banks in 1877 affected the opening of new bank offices. Banks with more Scottish directors built fewer new offices after 1878 than banks with fewer Scottish. The failure of the Glasgow bank made branch banks run by Scottish directors a dangerous signal of the stability of banks. It was easier for banks with higher exposure to Conservative newspapers to convince the depositors and shareholders that they followed cautious English practices than banks with lower exposure to Conservative newspapers. Therefore, the proportion of initial Scottish directors did not affect the building of new offices, because the banks were under close monitoring by shareholders.

In Table A9, I conduct a similar exercise for the amount of subscribed capital of banks. In Panel A, I show the impacts of the shocks resulting from the failure of the Glasgow bank on the subscribed capital of banks. Columns (1) and (3) show the estimation results for the subsample with lower exposure to Conservative newspapers. Columns (2) and (4) show the estimation results for the subsample with higher exposure to Conservative newspapers. I include bank and year fixed effects in columns (1) and (2), and include the interaction of pre-1878 characteristics and year fixed effects in columns (3) and (4). Due to the smaller size of subsamples, I only include the interactions of the number of offices and the number of partners in 1877 with year fixed effects as controls.<sup>45</sup> Column (1) suggests that banks with lower exposure to Conservative newspapers increased their subscribed capital more if they received larger shocks after the failure of the Glasgow bank. However, columns (2) and (4) show that banks with higher exposure to Conservative newspapers did not change their subscribed capital to the shocks. The trust created by nationalism and English identity could save the banks from increasing subscribed capital, and increase the returns to the stocks of these banks.

In Panel B, I show the differential impacts of the shocks on banks with different pro-

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<sup>45</sup>Including the interaction of unlimited liability with year fixed effects will exhaust degrees of freedom.

portions of Scottish directors. Columns (5) and (7) show the estimation results for the subsample with lower exposure to Conservative newspapers. Columns (6) and (8) show the estimation results for the subsample with higher exposure to Conservative newspapers. I include bank and year fixed effects in columns (5) and (6), and include the interaction of pre-1878 characteristics and year fixed effects in columns (7) and (8). Columns (5) and (7) show that, in towns with lower exposure to Conservative newspapers, banks with more Scottish directors in 1877 significantly increased subscribed capital more than banks with fewer Scottish directors if they received the same shocks. Columns (6) and (8) show that, in towns with higher exposure to Conservative newspapers, there is no evidence that banks significantly increased subscribed capital, whether they had more or fewer Scottish directors. The exposure to Conservative newspapers provided banks with an alternative strategy to emphasize Englishness instead of increasing capital.

Table A10 shows that banks in towns with higher exposure to Conservative newspapers were quite similar to towns with lower exposure to Conservative newspapers. Towns with more Conservative newspapers were more industrialized and banks in towns with more Conservative newspapers had lower amounts of paid-in capital. The baseline OLS estimation in Column (2) in Table 2 suggests that both manufacturing employment share and paid-in capital in 1877 predict the number of bank offices after 1878. Moreover, banks in towns with lower exposure to Conservative newspapers possessed larger capital. However, it was not the banks in towns with lower exposure to Conservative newspapers, but the banks with higher exposure to Conservative newspapers that did not increase subscribed capital to increase public confidence. It is also unlikely that other unobserved factors that affected the proportion of local Conservative newspapers created the different responses of banks with different proportions of Scottish directors to the panic.

#### 5.4.2 Topics Covered by Conservative and Liberal Newspapers

It was also likely that newspapers with different political orientations used different narratives when they reported the failure of the City of Glasgow Bank. The *British Newspaper Archive Database* only provides about 25% of the newspapers published in 1878 and included in the 1895 *Newspaper Press Directory*. Therefore, I cannot do a comprehensive analysis of the articles related to the Glasgow bank. Instead, I read the articles related to the City of Glasgow Bank between October 1878 and December 1879 in three newspapers. I chose newspapers that were inclined either to the Conservative Party or to the Liberal Party. I cover the newspapers located in towns with above-median exposure to Conservative newspapers to rule out the possibility that it was the differences between the narratives of different newspapers that affected the responses of banks in different subsamples. The Conservative newspapers that I cover are the *Derby Mercury* in Derby and the *Lancaster Gazette* in Lancaster. The *Derby Mercury* had 10 articles related to the Glasgow bank and the *Lancaster Gazette* had 53 articles related to the Glasgow bank. The Liberal newspaper that I cover is the *Huddersfield Examiner, and West Riding Reporter* in Huddersfield. The *Huddersfield Examiner, and West Riding Reporter* had 65 articles related to the Glasgow bank.

I read all the articles published in the three newspapers that discussed the City of Glasgow Bank and provide an overview of topics that these articles covered following (Beach and Hanlon, 2023). In Table A11, I show the number of articles that covered different topics related to the City of Glasgow Bank. The topics that Conservative Newspapers and Liberal Newspapers covered were quite similar, except one topic, historical crisis.<sup>46</sup>

Two articles in both Conservative newspapers compared the failure of the City of Glasgow Bank to the failure of the Western Bank in Scotland in 1857.<sup>47</sup> In the 1857 Financial Crisis,

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<sup>46</sup>They reported the depositors' panic, the disruptions to business activities, the poor management of assets of the Glasgow bank, the fake balance sheets issued by directors and misrepresentations to shareholders, the bankruptcy of related firms, the bankruptcy of shareholders, the fleeing of directors to foreign countries, the aid to the shareholders of the Glasgow bank from all over the country, relief from other banks, and the legal actions against the directors and regarding the liquidation of the bank.

<sup>47</sup>One is among the general social news in the *Lancaster Gazette* on October 5th, 1878. The other is the article titled 'The City of Glasgow Bank Failure' in the *Derby mercury* on October 9th, 1878.

it was the Liverpool Borough Bank but not the Western Bank that failed first (Turner, 2014, p.76). Recalling the failure of the Western Bank but not the Liverpool bank might aggravate the stereotype that Scottish banks were unreliable. However, similar reports were not restricted to Conservative newspapers. They can be also found in independent and Liberal newspapers.<sup>48</sup> Therefore, it was unlikely that newspapers affected the shocks that banks received due to the different details covered by newspapers with different political orientations.

In this section, I have shown that, for the subsample with below-median exposure to Conservative newspapers, banks with more Scottish directors in 1877 built fewer new offices but increased more subscribed capital to increase the confidence of the depositors and shareholders in them. For the subsample with above-median exposure to Conservative newspapers, banks could increase the confidence of the public in them by emphasizing their English identities. The nationalism advertised and nurtured by Conservative newspapers could save banks from increasing subscribed capital.

## 5.5 Alternative Mechanisms: Capital Size and Limited Liability

The number of bank offices was positively correlated with the amount of paid-in capital.<sup>49</sup> Therefore, it was likely that the differential impacts for banks with more offices and fewer offices were driven by the amount of bank capital before 1878. Therefore, in this section, I first test whether banks with different amounts of paid-in capital in 1877 had differential reactions to the negative shocks brought about by the failure of the Glasgow bank.

In Table A12, Panel A shows the heterogeneity analysis for banks with above-median

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<sup>48</sup>Among the records that I find in the online database of the *British Newspaper Archive*, besides the *Lancaster Gazette* and the *Derby mercury*, Conservative newspapers that mentioned the City of Glasgow Bank and the Western Bank together included the *Liverpool Mail*, the *Bucks Herald*, and the *Liverpool Daily Courier*. Independent or neutral newspapers that mentioned the two banks include the *Portsmouth Evening News*, the *Dewsbury Chronicle and West Riding Advertiser*, the *Huddersfield Daily Chronicle*, the *Liverpool Albion*, the *Cheshire Observer*, the *Newcastle Weekly Courant and North of England Farmer*, the *Staffordshire Advertiser*, and the *Ross Gazette*. Liberal newspapers include the *Sheffield Independent*, the *Manchester Times*, the *Western Daily Press*, the *Sunderland Daily Echo*, and the *Carlisle Express and Examiner*.

<sup>49</sup>The correlation coefficient for the year 1877 is 0.494.

amounts of paid-in capital in 1877 and those with below-median amounts of paid-in capital. The median amount of paid-in capital in 1877 was £201,236. The differences between banks with larger and smaller capital are not significantly different from 0. Both banks with above-median and below-median amounts of paid-in capital increased the number of their offices in response to the financial panic. Columns (3) to (6) show that banks with different amounts of paid-in capital in 1877 increased their capital differently. Columns (7) and (8) suggest that the losses of cash were similar in banks with larger and smaller capital. The concerns about the stability of banks were driven by the banks with fewer offices that suffered from liquidity loss. It was the number of bank offices but not the amount of paid-in capital that affected the expansion of English banks after 1878.

An important change that the failure of the City of Glasgow Bank brought to the English banking system was the adoption of limited liability (Turner, 2014). The adoption of limited liability provided a definite upper bound for the loss of shareholders were the bank to go bankrupt. Therefore, when the branches were far away from the residences of shareholders, it was likely that the shareholders were less worried about the misbehaviours of branch managers that they could not easily monitor. Limited liability lowered the costs of branching and made it easier for banks to increase the number of their offices.

I also test if the impacts of the shocks were different for banks that had adopted limited liability before 1877 and those that remained unlimited liability until 1877. The adoption of limited liability might alleviate shareholders' concerns about principal-agent problems and encourage banks to increase the number of offices. Banks that adopted unlimited liability turned to limited liability in a staggered way between 1879 and 1885. Therefore, if limited liability was a constraint on building new offices, it is likely that banks with limited liability in 1877 built more new offices than banks with unlimited liability in 1877 when they received the same shocks. Panel B shows the estimation results for limited liability. However, banks with limited and unlimited liability in 1877 did not behave differently in response to the shock from the perspective of branch sizes. The differences between the responses of banks

with limited and unlimited liability in 1877 are very small and insignificantly different from 0. Columns (11) to (14) show that banks that adopted limited liability did not change their capital differentially from banks that adopted unlimited liability. Columns (15) and (16) suggest that the losses of cash were similar for banks with different liability regimes.

The results in Panel B in Table A12 support the views that the failure of the City of Glasgow Bank did not lead to different assessments of the banks that adopted limited and unlimited liability (Acheson and Turner, 2008). To compete with banks that adopted unlimited liability, banks that adopted limited liability kept higher amounts of paid-in capital and reserve funds to provide security to depositors (Turner, 2014, p.125). The failure of the City of Glasgow Bank did not create differential concerns about unlimited liability among depositors. Therefore, turning to limited liability did not create a different speed of building new offices. The transformation to limited liability mainly alleviated the concerns of shareholders about potential bankruptcy like their unfortunate peers in Glasgow.

## 6 Conclusions

In this paper, I use the financial panic resulting from the failure of the City of Glasgow Bank in 1878 to show that bank branching might be used as a device to increase access to depositors and shareholders to increase the confidence of the public in banks. English banks also increased subscribed capital to provide more security to depositors. The impacts were mainly driven by banks with a below-median number of offices in 1877. The opening of new offices was likely due to the loss of liquidity of small banks during the panic.

In a period when the public relied on local newspapers to gain information, the exposure to different newspapers affected the views of readers. The views of people affected their confidence in banks. The emphasis of banks on their English identities, combined with the nationalism advertised by Conservative newspapers, provided an alternative tool for banks to increase public confidence in them. In towns with higher exposure to Conservative



newspapers, banks could increase the confidence of depositors and shareholders by recalling the English traditional banking practices without adding subscribed capital. They could also build new offices without concerning the number of their Scottish directors when English banking practices were in place.

This paper sheds some light on the relationships between the strategies of banks to build public confidence and the political attitudes of their customers. In the 1878 financial panic, banks utilized the nationalism spread by Conservative newspapers. They highlighted their English identities and cautious banking practices to substitute for opening new offices and increasing capital that were costly for shareholders. Political views do matter for the confidence in banks and the stability of the banking system.

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Appendix: Not for publication

# Appendix Tables

Table A1: Balance tests

	Pre-1878 Characteristics	Coefficient	SE
(1)	IHS( <i>Offices</i> <sub>1877</sub> )	0.264	0.317
(2)	1 (Limited Liability)	0.299***	0.0685
(3)	IHS( <i>Partners</i> <sub>1877</sub> )	0.504***	0.0963
(4)	IHS( <i>Paid – inCapital</i> <sub>1877</sub> )	0.651***	0.133
(5)	Latitude	-0.0565	0.219
(6)	Longitude	-0.239	0.220
(7)	Share Manufacture	0.0202	0.0395

*Notes:* In this table, I report the results of regressing pre-crisis bank characteristics on the inverse hyperbolic sine transformation of the number of newspapers. The coefficient column reports the coefficient of the inverse hyperbolic sine transformation of the number of newspapers. Standard errors are clustered at the town level. \*\*\*, \*\*, and \* indicate significance at the 1%, 5%, and 10% levels respectively.



Table A2: Robustness to different measures of shocks: OLS

	(1)	(2)	(3)	(4)	(5)
	IHS(Office Numbers)				
Shock $\times$ 1(Post-shock)	-0.0306* (0.0151)	-0.0777*** (0.0245)	-0.0649*** (0.0200)	-0.0450** (0.0198)	-0.0324* (0.0169)
Observations	788	788	788	788	788
Within $R^2$	0.00585	0.0526	0.0497	0.0253	0.00989
Pre-1878 Characteristics $\times$ Year Fixed Effects	None	None	None	None	None
	(6)	(7)	(8)	(9)	(10)
Shock $\times$ 1(Post-shock)	-0.0162 (0.0195)	-0.0844** (0.0352)	-0.0772** (0.0323)	-0.0492 (0.0307)	-0.0361 (0.0292)
Observations	788	788	788	788	788
Within $R^2$	0.105	0.146	0.150	0.125	0.114
Pre-1878 Characteristics $\times$ Year Fixed Effects	Yes	Yes	Yes	Yes	Yes
Bank and Year Fixed Effects	Yes	Yes	Yes	Yes	Yes
Months Gaps	1	2	3	4	5

*Notes:* This table reports OLS estimation results of Eq. (2) using different measures of the shocks that banks received after the failure of the City of Glasgow Bank. In columns (1) to (5), I include bank and year fixed effects. In columns (6) to (10), I also include the interaction of pre-shock characteristics and year fixed effects. In columns (1) and (6), I use the relative change in the market values of banks in a month between the end of September and the end of October in 1878. The corresponding gaps are two months for columns (2) and (7), three months for columns (3) and (8), four months for columns (4) and (9), and five months for columns (5) and (10). Time-invariant pre-shock controls include the number of bank offices, the number of partners, and the adoption of unlimited liability in 1877. Standard errors clustered at the town level are reported in parentheses. \*\*\*, \*\*, and \* indicate significance at the 1%, 5%, and 10% levels respectively.

Table A3: Robustness to different measures of shocks: IV

	(1)	(2)	(3)	(4)	(5)
	IHS(Office Numbers)				
Shock $\times$ 1(Post-shock)	-0.169* (0.0859)	-0.112** (0.0466)	-0.0926** (0.0418)	-0.101* (0.0499)	-0.246* (0.144)
Observations	788	788	788	788	788
KPF	15.24	34.72	36.70	25.03	5.993
Pre-1878 Characteristics $\times$ Year Fixed Effects	None	None	None	None	None
	(6)	(7)	(8)	(9)	(10)
Shock $\times$ 1(Post-shock)	-0.251 (0.164)	-0.136* (0.0746)	-0.107* (0.0605)	-0.115 (0.0682)	-0.308 (0.238)
Observations	788	788	788	788	788
KPF	8.913	12.84	15.86	12.72	1.465
Pre-1878 Characteristics $\times$ Year Fixed Effects	Yes	Yes	Yes	Yes	Yes
Bank and Year Fixed Effects	Yes	Yes	Yes	Yes	Yes
Months Gaps	1	2	3	4	5

*Notes:* This table reports IV estimation results of Eq. (2) using different measures of the shocks that banks received after the failure of the City of Glasgow Bank. In columns (1) to (5), I include bank and year fixed effects. In columns (6) to (10), I also include the interaction of pre-shock characteristics and year fixed effects. In columns (1) and (6), I use the relative change in the market values of banks in a month between the end of September and the end of October in 1878. The corresponding gaps are two months for columns (2) and (7), three months for columns (3) and (8), four months for columns (4) and (9), and five months for columns (5) and (10). Time-invariant pre-shock controls include the number of bank offices, the number of partners, and the adoption of unlimited liability in 1877. Standard errors clustered at the town level are reported in parentheses. \*\*\*, \*\*, and \* indicate significance at the 1%, 5%, and 10% levels respectively.

Table A4: Robustness to different measures of shocks: First-Stage

	(1)	(2)	(3)	(4)	(5)
	Shock $\times$ 1(Post-shock)				
IHS(News) $\times$ 1(Post-shock)	-0.918*** (0.235)	-1.395*** (0.237)	-1.680*** (0.277)	-1.547*** (0.309)	-0.633** (0.259)
Observations	788	788	788	788	788
Within $R^2$	0.247	0.410	0.439	0.352	0.0780
Pre-1878 Characteristics $\times$ Year Fixed Effects	None	None	None	None	None
	(6)	(7)	(8)	(9)	(10)
IHS(News) $\times$ 1(Post-shock)	-0.634*** (0.212)	-1.171*** (0.326)	-1.479*** (0.371)	-1.387*** (0.388)	-0.517 (0.426)
Observations	788	788	788	788	788
Within $R^2$	0.374	0.480	0.542	0.468	0.181
Pre-1878 Characteristics $\times$ Year Fixed Effects	Yes	Yes	Yes	Yes	Yes
Bank and Year Fixed Effects	Yes	Yes	Yes	Yes	Yes
Months Gaps	1	2	3	4	5

*Notes:* This table reports the first stage estimation results of Eq. (2) using different measures of the shocks that banks received after the failure of the City of Glasgow Bank. This table shows how the number of local newspapers before the failure of the Glasgow Bank led to the relative changes of the market values of banks in different months after October 1878. In columns (1) to (5), I include bank and year fixed effects. In columns (6) to (10), I also include the interaction of pre-shock characteristics and year fixed effects. In columns (1) and (6), I use the relative change in the market values of banks in a month between the end of September and the end of October in 1878. The corresponding gaps are two months for columns (2) and (7), three months for columns (3) and (8), four months for columns (4) and (9), and five months for columns (5) and (10). Time-invariant pre-shock controls include the number of bank offices, the number of partners, and the adoption of unlimited liability in 1877. Standard errors clustered at the town level are reported in parentheses. \*\*\*, \*\*, and \* indicate significance at the 1%, 5%, and 10% levels respectively.

Table A5: Robustness to different transformations of shocks

	(1)	(2)	(3)	(4)
	IHS(Offices)			
Shock $\times$ 1(Post-shock)	0.193** (0.0758)	0.202** (0.0940)	0.295** (0.117)	0.310* (0.160)
Within $R^2$ KPF	0.0477	0.143	39.05	14.92
	(5)	(6)	(7)	(8)
	IHS(Offices)			
Large Shock $\times$ 1(Post-shock)	0.164*** (0.0416)	0.183*** (0.0588)	0.582* (0.287)	0.565 (0.335)
Within $R^2$ KPF	0.0209	0.123	23.20	20.64
	(9)	(10)	(11)	(12)
	IHS(Offices)			
Shock $\times$ 1(Post-shock)	-0.0470*** (0.0159)	-0.0703** (0.0307)		
1(Price unchanged) $\times$ 1(Post-shock)	-0.0662 (0.0922)	-0.0235 (0.0681)		
IHS(Rank) $\times$ 1(Post-shock)			-0.0896** (0.0340)	-0.111** (0.0480)
Within $R^2$	0.0515	0.150	0.0240	0.127
Observations	788	788	788	788
Bank and Year Fixed Effects	Yes	Yes	Yes	Yes
Pre-1878 Characteristics $\times$ Year Fixed Effects	None	Yes	None	Yes

*Notes:* This table reports estimation results of Eq. (2) using different transformations of the shocks that banks received after the failure of the City of Glasgow Bank. In columns (1) to (4), I use a dummy to measure if the bank received a negative shock on its market value after the failure of the City of Glasgow Bank. It is 1 if the market value of the bank dropped. Columns (1) and (2) report OLS estimation results. Columns (3) and (4) report IV estimation results. In columns (5) to (8), I use a dummy to measure if the bank lost more than 10% of its market value after the failure of the City of Glasgow Bank. Columns (5) and (6) report OLS estimation results. Columns (7) and (8) report IV estimation results. In columns (9) and (10), compared to the baseline estimation, I add the interaction of the dummy showing that the market values of the bank did not change and the post-shock dummy. The coefficient of this interaction term is not reported here. In columns (11) to (12), I rank the relative changes in the market values of banks after the failure of the City of Glasgow Bank. The banks that had larger relative drops in the market values were ranked closer to 1. Time-invariant pre-shock controls include the number of bank offices, the number of partners, and the adoption of unlimited liability in 1877. Standard errors clustered at the town level are reported in parentheses. \*\*\*, \*\*, and \* indicate significance at the 1%, 5%, and 10% levels respectively.

Table A6: Instruments constructed by all newspapers and general newspapers

	(1)	(2)	(3)	(4)
	IHS(Offices)			
Shock $\times$ 1(Post-shock)	-0.0926** (0.0418)	-0.107* (0.0605)	-0.0926** (0.0432)	-0.107* (0.0630)
KPF	36.70	15.86	25.85	11.68
	(5)	(6)	(7)	(8)
IHS(News) $\times$ 1(Post-shock)	0.156** (0.0613)	0.159* (0.0937)	0.180** (0.0752)	0.176 (0.112)
Within $R^2$	0.0444	0.0843	0.0406	0.0809
Observations	788	788	788	788
Bank and Year Fixed Effects	Yes	Yes	Yes	Yes
Pre-1878 Characteristics $\times$ Year Fixed Effects	None	Yes	None	Yes

*Notes:* This table reports the IV estimation results of Eq. (2) using different instruments and corresponding reduced form estimation results. In columns (1) and (2), I use the baseline instrument. In columns (3) and (4), I use the number of general newspapers that paid attention to events related to general interests, excluding newspapers dedicated to special themes like music and sports, to build the instrument. In columns (5) and (6), I report the reduced-form estimation results using the baseline instrument. In columns (7) to (8), I report the reduced-form estimation results using the general-interest newspaper instrument. Time-invariant pre-shock controls include the number of bank offices, the number of partners, and the adoption of unlimited liability in 1877. Standard errors clustered at the town level are reported in parentheses. \*\*\*, \*\*, and \* indicate significance at the 1%, 5%, and 10% levels respectively.

Table A7: Robustness: Newspapers after the Panic

	(1)	(2)	(3)	(4)	(5)	(6)
	IHS(Office Numbers)		Shock X 1(Post-shock)		IHS(Office Numbers)	
	IV		First Stage		Reduced Form	
Shock $\times$ 1(Post-shock)	-0.0621 (0.174)	0.0753 (0.425)				
IHS(Newspapers) $\times$ 1(Post-shock)			-0.163 (0.652)	-0.157 (0.354)	0.0101 (0.0424)	-0.0118 (0.0526)
Observations	788	788	788	788	788	788
Within $R^2$			0.00605	0.349	0.0003	0.1039
KPF	0.0622	0.196				
Bank and Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Pre-1878 Characteristics $\times$ Year Fixed Effects	None	Yes	None	Yes	None	Yes

*Notes:* This table reports baseline estimation results of Eq. (2) using the instrument constructed based on newspapers constructed between 1879 and 1888. Columns (1) and (2) report the IV estimation results. In column (1), I include bank and year fixed effects. In column (2), I include the interaction of pre-shock characteristics of banks and year fixed effects. Columns (3) and (4) report the first-stage estimation results of the 2SLS estimation. Columns (5) and (6) report the reduced-form estimation. In column (5), I include bank and year fixed effects. In column (6), I include the interaction of pre-shock characteristics of banks and year fixed effects. Time-varying bank-level controls include 1(Limited Liability) and the number of partners (to add). Standard errors clustered at the town level are reported in parentheses. \*\*\*, \*\*, and \* indicate significance at the 1%, 5%, and 10% levels respectively.

Table A8: Robustness: Dropping two amalgamations

	(1)	(2)	(3)	(4)	(5)	(6)
	IHS(Office Numbers)				Shock X 1(Post-shock)	
	OLS		IV		First Stage	
Shock $\times$ 1(Post-shock)	-0.0423** (0.0156)	-0.0370* (0.0215)	-0.0439* (0.0232)	-0.0332 (0.0357)		
IHS(Newspapers) $\times$ 1(Post-shock)					-1.675*** (0.286)	-1.427*** (0.384)
Observations	777	777	777	777	777	777
Within $R^2$	0.0357	0.130			0.430	0.540
KPF			34.22	13.73		
Bank and Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Pre-1878 Characteristics $\times$ Year Fixed Effects	None	Yes	None	Yes	None	Yes

*Notes:* This table reports baseline estimation results of Eq. (2). Columns (1) and (2) report the OLS estimation results. In column (1), I include bank and year fixed effects. In column (2), I include the interaction of pre-shock characteristics of banks and year fixed effects. Columns (3) and (4) report the IV estimation results. In column (3), I include bank and year fixed effects. In column (4), I include the interaction of pre-shock characteristics of banks and year fixed effects. Columns (5) and (6) report the first-stage estimation results of the 2SLS estimation. Time-varying bank-level controls include 1(Limited Liability) and the number of partners (to add). Standard errors clustered at the town level are reported in parentheses. \*\*\*, \*\*, and \* indicate significance at the 1%, 5%, and 10% levels respectively.

Table A9: Subsample Analyses: Different Coverage of Conservative Newspapers

Panel A: Subsample Baseline	(1)	(2)	(3)	(4)
	IHS(Subscribed Capital)			
Shock $\times$ 1(Post-shock)	-0.0813** (0.0312)	0.00309 (0.0295)	-0.0795 (0.0502)	-0.00383 (0.0348)
Within $R^2$	0.0487	0.0001	0.110	0.143
Panel B: Heterogeneity: Scottish Directors	(5)	(6)	(7)	(8)
Shock $\times$ 1(Post-shock)	0.0320 (0.0429)	-0.0122 (0.0439)	0.0219 (0.0465)	-0.0200 (0.0433)
Shock $\times$ 1(Post-shock) $\times$ More Scottish	-0.178** (0.0731)	0.0525 (0.0634)	-0.160** (0.0608)	0.0455 (0.0708)
Within $R^2$	0.112	0.0044	0.156	0.145
Observations	199	244	199	244
Bank and Year Fixed Effects	Yes	Yes	Yes	Yes
Exposure to Conservative News	Lower	Higher	Lower	Higher
Pre-1878 Characteristics $\times$ Year Fixed Effects	None	None	Office & Partner	Office & Partner

*Notes:* Columns (1) to (4) show the heterogeneity analyses about the banks that were near Glasgow and those that were far away from Glasgow. The threshold in columns (1) and (2) is the median of the distances to Glasgow. The threshold in columns (3) and (4) is the 75% percentile of the distances to Glasgow. Columns (5) to (8) report the reduced-form estimation results of Eq. (2) using different instruments. In columns (5) and (6), I use the number of newspapers that held the views of the pro-Conservatives to build the instrument. The newspapers include those that held the views of Conservatives and were neutral but inclined to the Conservatives. In columns (7) and (8), I use the number of newspapers that held the views of the pro-Liberals to build the instrument. The newspapers include those that held the views of Liberals and were neutral but inclined to the Liberals. Time-invariant pre-shock controls include the number of bank offices, the number of partners, and the adoption of unlimited liability in 1877. Standard errors clustered at the town level are reported in parentheses. \*\*\*, \*\*, and \* indicate significance at the 1%, 5%, and 10% levels respectively.



Table A10: Balance tests

	Pre-1878 Characteristics	Coefficient	SE
(1)	IHS( <i>Offices</i> <sub>1877</sub> )	0.363	0.358
(2)	1 (Limited Liability)	-0.0538	0.124
(3)	IHS( <i>Partners</i> <sub>1877</sub> )	0.146	0.200
(4)	IHS( <i>Paid – inCapital</i> <sub>1877</sub> )	-0.448*	0.237
(5)	Latitude	0.225	0.366
(6)	Longitude	0.101	0.335
(7)	Share Manufacture	0.0706*	0.0377

*Notes:* In this table, I report the results of regressing pre-crisis bank characteristics on the dummy for exposure to an above-median proportion of Conservative newspapers. The coefficient column reports the coefficient of the inverse hyperbolic sine transformation of the number of newspapers. Standard errors are clustered at the town level. \*\*\*, \*\*, and \* indicate significance at the 1%, 5%, and 10% levels respectively.

Table A11: The Number of Articles: Topics related to the City of Glasgow Bank

Topics	<i>Derby Mercury</i>	<i>Lancaster Gazette</i>	<i>Huddersfield Examiner</i>
Panic	3	3	7
Business Disruption	3	8	14
Foreign Investments	0	1	1
Many Branches	1	2	1
Related Firms	2	17	9
Historical Crisis	1	1	0
Asset Misrepresentation	6	11	7
Poor Management	6	12	5
Shareholder Bankruptcy	4	15	2
Aid for Shareholders	1	9	4
Legal Actions	3	34	35
Total Number	14	54	65

Table A12: Heterogeneous Impacts of the Financial Panic on the Number of Bank Offices

Panel A: Paid-in Capital	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	IHS(Office Numbers)		IHS(Subscribed Capital)		IHS(Paid-in Capital)		IHS(Cash)	
Shock $\times$ 1(Post-shock)	-0.105*	-0.109	0.0189	-0.0716	-0.0063	-0.0303	0.0155	-0.0014
	(0.0567)	(0.0732)	(0.0428)	(0.0533)	(0.0263)	(0.0196)	(0.0344)	(0.0481)
Shock $\times$ 1(Post-shock) $\times$ Higher Paid-in Capital	0.0501	0.0604	-0.0551	0.0499	0.0015	0.0263	0.0062	-0.0092
	(0.0529)	(0.0642)	(0.0638)	(0.0708)	(0.0238)	(0.0194)	(0.0722)	(0.0765)
Within $R^2$	0.0649	0.177	0.0433	0.398	0.0017	0.248	0.0022	0.309
Panel B: Limited Liability	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Shock $\times$ 1(Post-shock)	-0.0730***	-0.0852***	-0.0413	-0.0176	-0.0315	-0.0123	0.0248	0.0105
	(0.0201)	(0.0255)	(0.0274)	(0.0417)	(0.0284)	(0.0197)	(0.0491)	(0.0267)
Shock $\times$ 1(Post-shock) $\times$ Unlimited Liability	0.0159	0.0121	-0.0371	-0.0287	0.0327	-0.0010	0.0064	-0.0328
	(0.0322)	(0.0448)	(0.0460)	(0.0685)	(0.0267)	(0.0185)	(0.0379)	(0.0735)
Within $R^2$	0.0514	0.150	0.117	0.394	0.0197	0.242	0.0057	0.308
Observations	788	788	445	445	445	445	363	363
Bank and Year FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Pre-1878 $\times$ Year FEs	None	Yes	None	Yes	None	Yes	None	Yes

*Notes:* This table reports the heterogeneous impacts of the financial panic on banks with different characteristics before the financial panic. In Panel A, I categorize banks into banks with an above-median amount of paid-in capital in 1877 and banks with a below-median amount of paid-in capital in 1877. In columns (1) and (2), I report the heterogeneous impacts of the shocks on the number of bank offices. In columns (3) and (4), I report the heterogeneous impacts of the shocks on the amount of subscribed capital. In columns (5) and (6), I report the heterogeneous impacts of the shocks on the amount of paid-in capital. In columns (7) and (8), I report the heterogeneous impacts of the shocks on the amount of cash. In Panel B, I categorize banks into banks that had adopted limited liability in 1877 and banks that still adopted unlimited liability in 1877. In columns (9) and (10), I report the heterogeneous impacts of the shocks on the number of bank offices. In columns (11) and (12), I report the heterogeneous impacts of the shocks on the amount of subscribed capital. In columns (13) and (14), I report the heterogeneous impacts of the shocks on the amount of paid-in capital. In columns (15) and (16), I report the heterogeneous impacts of the shocks on the amount of cash. The coefficients for the interaction term of the dummy of post-shock and the characteristic are not reported in the table. Standard errors clustered at the town level are reported in parentheses. \*\*\*, \*\*, and \* indicate significance at the 1%, 5%, and 10% levels respectively.