# Information Acquisition in Antebellum U.S. Credit Markets: Evidence from Nineteenth-Century Credit Reports

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## Abstract

If a lender can easily obtain more information about a borrower, under what conditions will he choose to do so? In this paper, I use a hand-collected set of records from the nineteenth century credit reporting agency, R.G. Dun & Company, that allows me to directly observe when lenders acquired information about their borrowers. I find evidence that lenders did not always seek information even though it was inexpensive and easily available. Instead, lenders were more likely to start accessing the reports for a borrower after they heard bad news, be it aggregate or borrower-specific. These results show that lenders require relatively more information about borrowers during an economic downturn, suggesting that information constraints likely play a more important role in credit market outcomes during these times. Furthermore, lenders responded to bad news about a borrower in their loan portfolio by acquiring information about other borrowers. This result sheds light on how one default can affect the larger credit network through contagious information acquisition.

JEL Codes: N2, N21, G24, E32
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# 1    Introduction

Asymmetric information is one of the primary sources of inefficiency in credit markets. A lender may choose not to extend credit to a borrower if he cannot be certain about the borrower's quality. A natural question is: if a lender can easily obtain more information about a borrower, under what conditions will he choose to do so? Surprisingly, we know almost nothing empirically about the answer to this question. The reason for this gap in the literature is that we generally do not observe when lenders acquire information. In many modern settings, information acquisition is unobservable because lenders and investors do not pay for access to information.[1] In other cases, information producers are simply reluctant to provide researchers with proprietary data on how their business functions.

This paper studies the world's first credit reporting agency, the Mercantile Agency, which was founded in the United States in 1841. The records of the Agency allow me to investigate information acquisition empirically for the first time. Using a hand-collected dataset of credit report inquiries, I establish three facts about information acquisition in a credit market. First, subscribers to the Mercantile Agency accessed few of the reports that the agency produced, despite the low marginal cost of accessing an additional report. Second, subscribers were more likely to start accessing the reports for a borrower after they heard bad news, be it aggregate or borrower-specific. Finally, subscribers were more likely to acquire information about a borrower if one of the subscriber's other borrowers defaulted.

The Mercantile Agency, later known as R.G. Dun & Co., provided wholesale suppliers of goods with information about merchants around the country to whom the suppliers extended trade credit. I have compiled every credit report that the agency produced about New Orleans mercantile establishments between 1850 and 1860, as well as the inquiries made by New York City subscribers concerning these reports. This dataset allows me to observe directly which reports each subscriber did (and did not) access, as well as approximately when the reports were viewed.

This paper examines when subscribers started accessing credit reports about a firm. I use survival analysis to estimate the relationship between adverse market-level and firm-specific shocks and the time a subscriber waits to inquire about a firm. This empirical strategy identifies the conditions under which a subscriber was most likely to access reports. The main empirical challenge is that the agency did not record the exact date of a subscriber inquiry. Instead, the agency only recorded that an inquiry occurred between the dates of one report and the next report. For example, the Mercantile Agency produced a report about the merchant P.A. Lanauze on July 20, 1857, and another on January 26, 1858. Three subscribers inquired after Lanauze between those two dates, but the records do not give an exact

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[1]For example, issuers, rather than investors, pay to have securities rated. Hence, there is no record of which rating an investor paid attention to or when.

date. Hence, the true inquiry date is time-interval censored. This paper contributes to the econometric literature by extending the standard duration model to account for this interval censoring.

The data reveal that subscribers accessed little of the information that the agency supplied. Although subscribers paid for a year-long subscription and had a low marginal cost of accessing each report, they only accessed 35 percent of the total reports the agency produced. This result is consistent with a rational inattention model in which a lender has limited cognitive processing capacity and, as a result, only pays attention to information likely to change his business decisions.

When did subscribers choose to pay attention to the credit reports that they did access? Subscribers in New York City who were accessing credit reports about businesses in New Orleans were more likely to acquire information after they heard market-level or borrower-specific bad news. A subscriber was 15 percent more likely to access a firm's credit report when there was an adverse shock to the New Orleans cotton market and 5 percent more likely to access a firm's credit report when there was an adverse shock to the New York City money market. I do not find evidence that lenders responded to good news about the economy. Existing literature suggests that lending generally increases during a boom period, yet my findings suggest that subscribers waited until the adverse shock before they acquired information. Hence, these results suggest that subscribers did not engage in constant screening of potential borrowers. Rather, subscribers either screened potential borrowers more carefully after an adverse shock or checked on an existing contract that had been initiated during the boom.

Furthermore, subscribers were 48 percent more likely to access a credit report about a firm after that firm defaulted on a loan. This result provides further evidence that subscribers often originated loans without consulting a credit report. Lenders may have had some information about borrowers when they first contracted but they did not use all information that was available. Furthermore, this result is consistent with a model of ex-post verification; lenders require information after a borrower defaults and the lender has to determine the nature of the default and the amount of value that they can recover.

Finally, subscribers were 51 percent more likely to access a credit report about a firm if one of the subscriber's other borrowers defaulted - particularly if the firm and the defaulting borrower were in the same industry or ethnic group. This result, consistent with a credit market exposed to a high degree of counterparty risk, suggests that lenders learned about broader market conditions and more specific shocks that might affect their borrowers from their own portfolios. Uncertain whether the default was caused by an market- or borrower-specific shock, subscribers accessed credit reports about multiple firms to resolve this uncertainty.

If subscribers were more likely to acquire information about borrowers after an adverse shock to New Orleans, how did they react to a major financial disturbance in New York City? To address this question, I consider the financial panic that overtook the United States in 1857. On August 24, 1857, the Ohio Life and Trust Company, of Cincinnati, Ohio, failed. Seven weeks later, on October 13, New York City banks suspended operations and did not resume until December 11.[2] Subscribers were, if anything, less likely to obtain information about New Orleans firms during 1857. There are two possible explanations for this finding. First, fewer firms defaulted in the Southern United States than in Northern cities. During this period, lenders may have focused their information gathering on firms in cities that were affected by the panic. Second, interruptions in New York City bank operations may have mechanically reduced interest in credit reports. Subscribers often used credit reports as proof that a promissory note was sound when discounting the note at a bank. Credit report inquiries may have decreased simply because note discounting stopped when New York City banks suspended operations.

This research contributes to the fields of information economics and economic history by exploring how subscribers acquired information through the Mercantile Agency in the nineteenth century. It has been a long tradition in economics to study the structure of information (for example, asymmetric or incomplete information). The theoretical literature on information acquisition discusses how that structure arises when agents can choose their information sets.[3] To generate testable predictions, most theory focuses on information acquisition in centralized market settings where information is partly revealed in prices. In a centralized market, investors take into account strategic motives when they acquire information. For example, investors may acquire less private information if they expect prices to reveal all information. This paper studies a more decentralized market in which prices do not reveal information. In a decentralized setting, lenders and investors face a different decision problem when they acquire information because they cannot rely on prices for information and do not have to worry about their information being revealed in prices. We know relatively little about information acquisition in decentralized markets despite their prevalence. Furthermore, the empirical literature relies on indirect measures, such as price co-movement or fund performance, to test the theoretical models.[4] For the first time, this paper measures information acquisition directly.

Recent studies in finance have shown that the design of markets and securities can affect how much information investors acquire. For example, Dang, Gorton, and Holmstrom (2009) show that investors require less information to trade debt securities than they do for equity.[5] Studies have also shown that in environments where only limited in-

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[2]All of my regressions control for the financial panic to ensure that it does not drive my results.

[3]See, for example, Veldkamp (2011), Grossman and Stiglitz (1980), and Van Nieuwerburgh and Veldkamp (2010).

[4]See, for example, Klenow and Willis (2007) and Kacperczyk, et al. (2012).

[5]See, also, Gorton and Pennachi (1990) and Townsend (1979).

formation is acquired during normal times, a sudden shock can lead to more information production.[6] For example, Calomiris and Gorton (1990) argue that depositors run on banks to learn about the quality of the bank. The financial accelerator model presented by Bernanke, Gertler, and Gilchrist (1996) argues that investors flee to high quality investments when there are adverse shocks to financial markets. My work offers direct evidence consistent with these theories but in a credit market directly connected to trade.

Most of the literature on the history of the Mercantile Agency relies on contemporary reports to study the operations and broader importance of the agency.[7] There have been few attempts to undertake the rigorous analysis of primary sources needed to determine the role of credit reporting in nineteenth century commerce.[8] My research contributes to our understanding of the Mercantile Agency and the role of credit reporting in the development of the U.S. economy by studying how lenders used credit reports.

The rest of the paper proceeds as follows. Section 2 provides background on the nineteenth century American trade credit market and the origins of credit reporting. Section 3 outlines testable hypotheses about how subscribers used credit reports. Section 4 introduces a new dataset that I have compiled from the credit report records of the Mercantile Agency. Section 5 describes the estimation strategy. Section 6 present results from the estimation. Section 7 concludes.

## 2 Background

### 2.1 Nineteenth Century American Commerce

During the Antebellum period and throughout the nineteenth century, goods were distributed across the United States through networks of merchants. Twice per year, merchants around the country travelled to New York City, or another eastern port city, to connect with wholesale merchants and jobbers from whom they could buy goods.[9] The majority of consumer goods in the United States were distributed in this manner. Examples include boots and shoes, dry goods, produce, groceries, and furniture.

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[6] See Dang, et al. (2009), Farhi and Tirole (2012), and Gorton and Ordonez (2012).

[7] See Norris (1978), Foulke (1941), Olegario (2003, 2006), and Atherton (1946).

[8] Carruthers and Cohen (2010) and Flandreau and Mesevage (2014) are two notable exceptions.

[9] Suppliers were usually wholesale merchants or jobbers. A jobber was a type of intermediate merchant who bought large quantities of goods from wholesale merchants and sold smaller packages of goods to merchants around the country. Factors and commission merchants were also important types of intermediate merchants. In contrast with jobbers, factors only purchased goods on the accounts of others, rather than on their own account. A jobber claimed ownership of goods while factors did not. A commission merchant sold partly on his own account and partly on the account of others. Both factors and commission merchants earned money by taking a commission on sales. See Porter and Livesay (1989) page 5.

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Merchants typically purchased goods on trade credit: the supplier sent goods to the buyer's local market in exchange for a promissory note from the buyer. The promissory note stated that the buyer would pay the supplier a fixed amount of money at a fixed time in the future. Suppliers used promissory notes in courts as proof of a transaction and discounted notes at banks to obtain liquidity.[10] Through trade credit, suppliers were creditors and buyers were debtors.

The supply chain from producer to end consumer often involved several merchants. For example, a pair of shoes might have gone through three or four intermediary merchants before finally ending up on a Louisiana plantation.The first link of the chain consisted of the shoe producer, such as a Boston manufacturer, and a New York City wholesaler who distributed the shoes. Next, the New York City wholesaler contracted with a wholesale shoe merchant in New Orleans. The New Orleans wholesale merchant sold shoes to a cotton factor who, finally, delivered the shoes, along with many other goods, to the planter.[11] Each transaction relied on credit.[12]

The reliance of trade on credit exposed each supplier-creditor to the risk that the buyer-debtor would not repay on time or at all. Creditors faced a variety of default risks, based on everything from market volatility to dishonest trading partners. For example, the debtor and creditor implicitly agreed to a contract price for the goods. However, the local market price may have dropped by the time the debtor was able to sell the goods in his own market, leaving the debtor unable cover the difference except with his own assets. There was also the risk that the debtor would sell the goods and run off to another city or country with the proceeds.[13]

The best aggregate statistics on the incidence of default in the United States during the Antebellum period come from the short-lived Bankruptcy Act of 1841 and the financial panic in 1857. Under the act, more than 33,000 individuals applied for bankruptcy with a recovery rate of at most 10 cents on the dollar.[14] According to R.G. Dun & Co., which posted aggregate business failure statistics from 1857 onward, about 242 in 10,000 firms failed in 1857.[15] Failures during financial distress offer only a lower bound on default and delinquency statistics. Contemporary sources suggest, however, that business people perceived a high rate of failure in the economy. For example, an anonymous author

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[10]Some suppliers also extended credit on open accounts, without an explicit promise to pay. For a more detailed description of trade see Porter and Livesay (1989).

Banks were said to have discounted a note if they purchased it from the holder at a price less than face value. For more on promissory notes see Foulke (1941).

[11]Cotton factors were a common type of factor in New Orleans during the nineteenth century. As discussed in footnote 9, factors bought and sold on the accounts of others. Cotton factors in New Orleans acted as agents for cotton planters in the region, both marketing the cotton crop and purchasing goods for the plantation. For more on the cotton factorage system see Woodman (1968) Part One.

[12]Retail merchants sold goods to consumers on credit, although consumer transactions were typically conducted on open accounts. For example, a farmer obtained goods from local retail merchants during the planting season. The merchant recorded the sale of goods in his ledger and was not repaid, in general, until the harvest season when the farmer sold his crops. At that time, the merchant settled his accounts with his customers and was able to repay the wholesale merchant from whom he had acquired the goods.

[13]Borrowers often allowed their notes to be protested, a form of delinquency. If a debtor did not repay his promissory note at the date required, the note holder could present it to a notary public to be protested. The notary then gave notice of non-payment to the payer and any endorser of the note.

[14]See *Debow's Review*, volume 8 (1850): 78.

[15]*Historical Statistics of the United States.*

commented in *Hunt's Merchant Magazine* "that out of every hundred individuals who enter upon a commercial career, not more than three are entitled to be considered entirely successful."[16]

When a debtor was delinquent on a loan or failed, a creditor could take one of many actions to mitigate his losses. A creditor could act unilaterally to liquidate the loan by suing the debtor and placing a lien on his assets. A creditor could also show leniency by renegotiating the terms of the loan or offering an extension. Various creditors of the same borrower often coordinated their actions in response to the borrower defaulting on their loans. Many creditors could meet and renegotiate terms across loans or, more likely, they could use legal assignment to liquidate the assets of the borrower. Under legal assignment, debtors transferred their assets to a third party who distributed the proceeds of the sale of assets to the creditors as per an agreement between the debtor and creditors.[17] Legal assignment allowed parties to credibly commit to resolve failures quickly.[18]

Creditors made decisions about how to resolve a default based on the status and characteristics of the borrower and on the creditors own position. Several features of the commercial market at the time influenced the creditor's best course of action at the time of default. Most mercantile establishments were unlimited liability single proprietorships or partnerships. Hence, creditors could attempt to seize the personal assets of the individual partners of a firm but the probability of success depended on the debtor's net worth, the prevailing state or federal laws, and the total indebtedness of the borrower. Between 1843 and 1867, the United States had no federal bankruptcy law that governed how to resolve failures. Rather, a diverse range of state laws generally dictated how a creditor could resolve a default. Those laws typically favored debtors and in-state creditors. For example, the Louisiana civil code specified privileged creditors, such as wives and lessors, who were automatically repaid first in the case of debtor insolvency.[19] Furthermore, creditors could not take legal action against a debtor until the maturity of the loan; by that time other creditors may have seized the assets of the borrower. In such a case, creditors were better off not spending resources trying to collect on assets that did not exist.

A creditor's best course of action after default also depended on the nature of the default and the creditor's own status. For example, a creditor may have preferred to renegotiate a loan if the debtor was illiquid rather than insolvent. Creditors were also suppliers who valued good trading partners. A creditor who showed a debtor leniency in the

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[16]*Hunt's Merchant Magazine*, volume 41 (1859): 521. For more on the perception of failure in the Antebellum period and the Bankruptcy Act of 1841, see Balleisen "Navigating Failure."

[17]*Hunt's Merchant Magazine*, volume 16 (1847): 56.

[18]Earlier in the nineteenth century a debtor could be imprisoned for not paying his obligations but by the 1850s there were no more debtors' prisons.

[19]Commission merchants or factors were another particularly important class of privileged creditor in Antebellum Louisiana. Factors had privilege upon "the property of the principal in their hands, for the payment of their expenses, commissions, and advances, and for the general balance due them." *Hunt's Merchant Magazine*, volume 16 (1847): 56.

resolution of a default might allow a debtor time to recover losses while maintaining a repeated trading relationship. However, suppliers were borrowers as well as lenders in this setting. Suppliers purchased goods from manufacturers and other wholesalers on credit; wholesalers and jobbers could discount promissory notes at banks in New York City in exchange for cash. A supplier may not have had the liquidity to renegotiate a loan with a debtor when his own creditors were requesting payment and may have been forced to liquidate.

Suppliers acting as creditors primarily managed their risk through their selection of trading partners and monitoring their existing portfolio of borrowers. To do so, they obtained information about aggregate economic conditions or about specific firms.[20] To obtain aggregate information, they primarily relied on the extensive financial press, as well as on conversations with other businessmen.[21] These suppliers first learned information about potential buyers when they met for the first time. Buyers travelled to the Northeast to find trading partners. When they arrived, they either visited the establishments of potential suppliers or, during a boom, were approached at their hotels by representatives of the suppliers.[22] In either case, suppliers judged the quality of potential buyers based on this initial interaction. Additionally, suppliers often requested a letter of recommendation or introduction for the buyer. Prominent businesspeople either in New York City or in the buyer's local market typically furnished these letters. The letter could indicate an explicit endorsement, such as a promise by the letterwriter to pay in the case of a default by the potential buyer, or merely a character reference. Suppliers could ask other merchants in New York City about their experiences in lending to a potential buyer. Occasionally, suppliers maintained agents or other contacts in other cities who could report on the quality of a borrow.[23] Finally, a supplier could obtain information about a specific buyer by accessing a credit report.

## 2.2   Credit Reporting

Creditors in search of information about borrowers often turned to credit reporting companies such as the Mercantile Agency. Founded in 1841 by Lewis Tappan, the agency provided suppliers with merchant-specific information about their trading partners. Later known as R.G. Dun & Co., the company led the credit reporting market throughout the nineteenth century, along with its primary competitor, J.M. Bradstreet & Co. In 1933, the competitors merged to form Dun & Bradstreet, which still provides business and credit information today.[24]

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[20]Creditors could also discount their promissory notes at banks to increase liquidity and decrease their exposure to firm-specific risks.

[21]See John (1995). In the nineteenth century the U.S. Postal Service subsidized the circulation of newspapers and so financial and economic information about distant American and European cities was easy to obtain, especially in New York City.

[22]Olegario, Rowena, *A Culture of Credit: Embedding Trust and Transparency in American Business* (Harvard University Press, 2006): 5

[23]Norris, James D. *RG Dun & Co., 1841-1900: The Development of Credit Reporting in the Nineteenth Century.* (Greenwood Press, 1978): 6

[24]For more on the histories of R.G. Dun and J.M. Bradstreet & Co. see Norris (1978), Foulke (1941), and Madison (1974).

The agency recruited attorneys in local markets to collect regular credit information on firms. Using local correspondents, the agency built on the existing system of recommendations and exploited correspondents' knowledge of the business networks that existed in local markets. Rather than paying correspondents directly, the agency compensated correspondents through business referrals. The agency asked its customers to use attorneys who worked as correspondents whenever possible when the subscriber needed collection assistance in distant markets.[25]

Correspondents received semi-annual circulars with instructions concerning on whom and what to report as well as when those reports should be sent. The agency requested two updates per year, corresponding to the spring and fall seasons. Correspondents were asked to report on the character and business habits of members of the firms, an estimation of their means, and any changes to the firm, including failures or court cases.[26] The agency consistently requested that correspondents write full updates on merchants, rather than simply stating "No Change," an instruction ignored by most correspondents. While the agency supplied correspondents with lists of merchants on whom to report, circulars also mentioned that subscribers should report on new merchants.[27]

New York City businesses subscribed to the Mercantile Agency for an annual fee proportional to their sales. The fee was typically around $100 per year.[28] A subscription entitled the business to send a confidential clerk to the headquarters in New York City to hear the content of a credit report upon request. The agency required that subscribers visit the office and hear the report rather than read it to stem the leaking of information to non-subscribers and so that it could track about which firms its subscribers were interested. Prior to the Civil War, subscribers could hear as many reports as they requested. By the late 1870s, the subscription contract capped the base number of reports the subscriber could request and specified a fee for additional reports above the cap.[29]

Starting in 1843, in Boston, Tappan opened several branches of the Mercantile Agency on the East Coast. Branches fulfilled two main roles. First, the manager of a branch coordinated correspondents reporting on merchants in the region. The branch kept copies of credit reports for merchants and sent the originals to the agency headquarters. Second, branches served subscribers who lived in the area. A subscriber in Boston, for example, could visit the Boston branch to hear credit reports, rather than traveling to New York. The branch office did not keep reports on merchants outside of their region. Instead, the branch sent a request to the main office when a subscriber asked for a

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[25] Despite the varying success of this compensation system, it persisted throughout the early period of the agency. Furthermore, the compensation system begs questions about the accuracy of the credit reports given the incentives faced by correspondents. See Olegario, *A Culture of Credit*, 51-52 for a discussion of why correspondents might report honestly.

[26] See the circulars in Box 58 in the Dun & Bradstreet Corporation Records, Baker Library, Harvard Business School.

[27] Circular dated December 1853 to Cincinnati, Box 58, Dun & Bradstreet Corporation Records.

[28] Dun & Bradstreet Collection, v. 26. Also see Norris: 20

[29] For details on initial subscription see Norris, *R.G. Dun & Co.*: 26; for details on the later contracts see Norris, *R.G. Dun & Co.*: 141.

report for a merchant outside the region. While branches were responsible for their own income, the interchange of information across branches was free, including postage.[30]

The agency grew to great success within the first two decades of its existence. While the agency had merely 280 active subscribers in 1844, by 1855, that number had grown to 1,181.[31] The financial press was initially skeptical of credit reporting, calling it a "system of espionage." By 1851, *Hunt's Merchant Magazine* declared "the agency is conducted on high and honorable principles, and is truly and extensively useful, not only to the city merchants, for whose immediate benefit it was devised and established, but to all sound upright industrious traders, throughout the land."[32]

# 3   Hypotheses

Many creditors subscribed to the Mercantile Agency by the 1850s and the financial press extolled the benefits of such a subscription. But for what purpose did subscribers use the information found in the credit reports that they obtained from the agency? There are two main theoretical motives to acquire information: screening and state verification.[33] A creditor collects information to screen a potential borrower prior to establishing a contract to determine if the borrower deserves a loan. A creditor collects information for state verification about a borrower with whom he has an existing contract after that borrower has defaulted. In this case, the creditor uses information to determine the cause of the default and the recovery value on the contract. The timing of information collection in the life of the contract for these two cases generates testable hypotheses about how information acquistion changes with aggregate market fluctuations.

If screening were the primary motive for accessing information, then we should expect that creditors obtained more information about borrowers during an economic expansion. As more contracts were signed and trade expanded, creditors would need to obtain more information to screen potential debtors.[34] If creditors primarily acquired information for the purpose of state verification following default, we should expect that creditors acquired more information during an economic downturn, when defaults increased. If state verification and screening were equally important, we would not expect information acquisition to be correlated with aggregate market conditions. We might also expect this result if creditors frequently monitored their borrowers over the course of a contract.

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[30]Norris, *R.G. Dun & Co.*: 29.

[31]Norris, *R.G. Dun & Co.*.

[32]*Hunt's Merchant Magazine*, volume 24 (1851): 51.

[33]Monitoring is another theoretical motive for information acquisition but is indistinguishable from state verification in the current data, as discussed below.

[34]An underlying assumption is that creditors and debtors were more likely to form new trade relationships when the economy was doing well, not merely conduct more trade with existing trading partners.

There are two other important reasons why we might expect information acquisition to be countercylical. First, creditors may have been relatively more likely to screen a potential borrower during a downturn than during a boom. Second, creditors may have monitored their borrowers in anticipation of default when they received bad news about the aggregate state of the economy. As discussed in the background section, creditors in the nineteenth century United States needed to act quickly to resolve defaults to minimize loss given default. If a creditor learned of a default after it had occured, it was often too late for the creditor to act quickly enought to recover anything. Hence, creditors may have monitored borrowers in anticipation of a default.[35]

To test these hypotheses, we require data on both credit report inquiries and market fluctuations. As will be discussed in detail in the next section, the credit report records of the Mercantile Agency reveal approximately when subscribers to the agency inquired after credit reports. However, in the early nineteenth century, there were no widely circulated measures of output or interstate trade. For this paper, I test these hypotheses by investigating how local prices fluctuations in New York City and New Orleans affected the timing of when New York City subscribers inquired about New Orleans firms in the 1850s.

New Orleans in the 1850s provides an ideal market to study the cyclicality of how information was acquired through credit reports. New Orleans was the fifth largest city in the United States at the time. It was also the largest American city over 500 miles away from New York City, making it ideal for studying long distance information acquisition. Further, the cotton market provides clearly defined and measurable aggregate fluctuations in New Orleans at a time when there were limited aggregate statistics. The cotton factorage system dominated the marketing of cotton in the South during the Antebellum period. Cotton factors both sold cotton on behalf of and purchased consumption goods for planters in the region. Factors wrote contracts with local merchants in New Orleans that promised to pay for consumption goods. New Orleans merchants seemingly unrelated to the cotton market were thus exposed to financial strain when the cotton market underperformed expectations through these credit entanglements.[36]

The period of study for this paper is the 1850s. The Mercantile Agency began recording credit report inquiries in their records in 1850, which allows me to measure information acquisition after this date. Prior to 1860, subcribers to the agency paid a flat yearly fee to access unlimited credit reports. After the Civil War, the Agency changed the subscription contract so that subscribers paid a yearly fee for access to a fixed number of credit reports with the option to pay a fee for additional reports. This paper focuses on the period during which subscribers could access unlimited

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[35]Anticipatory monitoring is similar to state verifcation but does not require a realized default.

[36]For more, see Woodman, Harold D. *King Cotton and his retainers: Financing and marketing the cotton crop of the South, 1800-1925.*( Beard Books, 1968). From *King Cotton* (p 41): "The entire credit structure was built on the presumption that cotton, when it finally came to market and was sold, would cancel all debts. But this was not always the case. Often sales failed to net the sum needed to pay off loans granted during the year."

reports to reduce the chance that subscribers made decisions based on the marginal cost of an additional report. By focusing on the 1850s, this paper can also investigate how the motivation for creditors to access credit reports may have changed during a national financial panic, the panic of 1857.

# 4    Data

Between 1841 and the 1890s, the Mercantile Agency recorded all of the credit reports about merchants in large ledgers, organized by city or county and kept at the New York City headquarters. These ledgers not only provide extensive information about nineteenth century American commerce through their description of merchants but also reveal how agency subscribers used credit reports. As correspondents sent information about mercantile establishments to the main office, clerks recorded the reports in the ledgers, leaving space before the entry of the next firm in which subsequent reports could be entered. If a subscriber to the agency inquired after a firm, the clerk recorded the subscriber's unique identification number after the firm's most recent report. The following report for the firm was recorded directly after any subscriber numbers from the previous report. Figure 1 shows an example of a set of reports for the Savannah firm Hyland & O'Neal, including subscriber numbers.

For this paper, I have constructed a dataset of all credit reports written about New Orleans mercantile firms between January 1850 and December 1860 from the R.G. Dun & Co. Credit Report Records, Louisiana Volumes 9 through 11. The dataset consists of 37,435 reports written about 4,584 firms. It contains several firm-level variables: firm name; line of business; address (if available); changes in the firm (for example dissolutions and additions of partners); ethnicity of partners; the dates of the first and last reports; and total number of reports in records.[37] For each credit report in the time period of interest, the dataset contains: the date of the report; information about the content of the report (for example a change in firm structure, the death of partner, or a default event); and the identification numbers of subscribers or branches who inquired after the report. See Table 1 for the summary statistics for the New Orleans 1850-1860 sample.

The structure of the data is best described using an example. For this purpose I will discuss the credit report history of the merchant P. Adolphe Lanauze.[38] Lanauze was a retail hardware merchant in New Orleans who went out of

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[37] For 92 percent of firms with a report in the 1850s, I have collected the full set of reports. The firms for which I do not have full reports have subsequent reports in much later volumes that can be collected in the future. In my data, ethnicity is defined as what the agency reported for at least one of the partners. Ethnic group sometimes means place of birth, such as Ireland or Germany, but can also mean Creole or Free Person of Color. See the online appendix for relative frequencies of different ethnicities in the credit reports.

[38] For the credit reports of Lanauze see Louisiana Vol. 10, p. 358. R.G. Dun & Co. Credit Report Volumes. Baker Library, Harvard Business School.

business in 1870. On April 25, 1851, the correspondent "PM" wrote the first credit report about Lanauze for the Mercantile Agency. It read: "Been in business sometime, has 2 stores joining. Worth about $30 thousand. Good and safe. There is no [co-partner]. Creole Frenchman."[39] This was a standard credit report during the 1850s. The correspondent usually noted the firm's net worth (often in the form of real estate or slaves), the composition of the firm (in this case no co-partner), the ethnicities of the partners, and a character assessment of the partners.

Agency correspondents wrote a total of 18 reports about Lanauze between 1851 and 1860 and an additional six reports between 1861 and 1870.[40] Most of the subsequent reports simply reiterated the details from the first report. All of the reports on New Orleans merchants followed this general format: a detailed first report, repetition of original information in most subsequent reports, and detailed updates when a major event occurred. Major events included default-type events (for example having a note protested), legal trouble, or the death of a partner. Lanauze did not experience any legal problems and seemed to have always paid his notes on time. The only event that revealed any potential trouble was in July 1857, when he lent his brother money after a business failure. The text of all of Lanauze's reports between 1850 and 1860 can be found in table 2.[41]

When Lanauze's first credit report arrived in New York City, a clerk recorded his name, line of business, and his first report in the first ledger of reports for Orleans Parish, Louisiana. The clerk then left room for subsequent reports about Lanauze before recording the name of the next merchant. In the credit report ledger, the number 695 is written after the text of Lanauze's first report. This number indicates that the subscriber with identification number 695 heard the report. To access the credit reports, subscribers visited the main office and asked to hear the reports of firms. After a clerk read the report aloud to the subscriber, he recorded the subscriber's unique identification number after the text of the report. When the next report arrived from New Orleans in March 1852, the clerk simply entered the information after the numbers and the previous report, filling up the space allocated in the ledger for Lanauze. The location of the number in the reports indicates the approximate timing of the inquiry. While we do not know the exact date on which subscriber 695 inquired after Lanauze, we know that he inquired sometime between April 1851 (the date of the report) and May 1852 (the date of the next report).

Figure 2 plots the months on which Lanauze's reports were written with a vertical line at the month of the report. The timing of reports for Lanauze reflects the pattern for most firms. Firms generally received about two reports per year with an occasional extra report. However, reports were not updated on a strict schedule at fixed months. Hence, there

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[39]Ibid.

[40]Most reporting stopped 1861 for the duration of the American Civil War and resumed in 1866. However, a few merchants did receive reports during the war.

[41]For more about the language used in the credit reports, see Olegario (2006).

were not always exactly six months between reports.[42]

The subscriber identification numbers of the 15 subscribers in New York City who inquired after Lanauze between 1850 and 1860 are listed on the y-axis of figure 2. The month of the first report that each subscriber inquired after is marked with a circle. The month of any subsequent reports that each subscriber inquired after is marked with a triangle and connected to the first inquiry with a dotted line. Lanauze received a total of 21 inquiries, six of which were by a subscriber inquiring for a second or third time. Despite the many inquiries he received, no one ever heard 9 out of his 18 reports, as indicated with an open circle on those report months.[43] As we will see, it was not uncommon for the agency to produce reports that no subscriber ever heard.

A total of 2,128 unique subscribers in New York City inquired after at least one report in New Orleans and those subscribers made a total of 21,830 inquiries. Ten agency branches in other cities across the United States accounted for another 6,525 inquiries.[44] Panels A and B in Table 3 present statistics on firms based on whether or not a subscriber in New York City ever inquired after the firm. Overall, firms had an average of about four years of reports between 1850 and 1860, and 8.1 years of reports between 1845 and 1894, the time over which the agency reported on New Orleans. On average, each firm had 1.8 reports per year. As mentioned earlier, firms were not reported on at fixed intervals. Further, the report dates across firms do not coincide. See Table 4 for statistics on the amount of time between each report. On average, the agency produced reports on firms on an approximately semi-annual basis. However, the time between one report and the next ranged from one month to eight years.[45]

As a result of the uniqueness of the identification numbers of subscribers in New York City, it is possible to track subscriber inquiries within and across firms. Panel C in Table 3 gives statistics for inquiries by subscribers. On average, subscribers inquired ten times and inquired after 6.9 different firms. Subscribers differed significantly by how many inquiries they made in New Orleans: one subscriber (#7) alone heard a total of 440 reports about 157 firms. Conditional on having at least one inquiry, firms had an average of 10.6 inquiries from 7.7 subscribers. As with subscribers, there was a large amount of variation over how many inquiries each firm received. On the extreme end, 175 different subscribers in New York City inquired after the dry goods merchant, Charles M. Simpson, a total of 314 times between 1850 and 1860.

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[42]I measure reports at a month level because, while all report dates give a month and year, not all give a day.

[43]The 50 percent of reports for Lanauze that did not receive inquiries from New York City did not have inquiries from other branches. The report written on January 1858 also received an inquiry from a subscriber in Boston but this report was also heard by three subscribers in New York City.

[44]I can identify unique New York City subscribers by their identification number and I know the name of the subscriber for a small subset. Based on the unique identifier, I can measure repeat inquiries of particular firms and total inquiries by an individual subscriber. Inquiries by branch subscribers were indicated by the identification number of the branch. Hence, I know whether at least one subscriber at a particular branch inquired after a firm.

[45]The number of months between reports was determined by the agency's supply of reports. In another paper, I investigate the timing of the supply of reports to determine how inquiries and particular events changed the amount of time until the next report.

Firms often engaged in multiple lines of business or switched lines part way through the period of interest. Furthermore, lines of business were often described in general terms, such as "Dealer," or very narrow terms, such as "Adjuster of Average." This makes it difficult to assign firms to industries. For the purpose of this paper, I have defined several large categories of industries and assigned a firm to an industry if it was ever listed as engaged in that line. As a result, a firm can be assigned to multiple industries. For example, a firm can be categorized as a commission merchant and engaged in the cotton trade. Table 5 presents statistics on several of the largest industries to give a sense of the lines of goods covered in the reports.

Default events were not overly common within the reports: only about 3 percent of reports mention a default event, where default events include protest, sued, failed, etc.[46] However, 16.7 percent of the firms experienced at least one default event. Hence, many firms were affected by default.

More than 2,000 suppliers in New York City paid for access to the credit reports produced by the Mercantile Agency and accessed at least one report about New Orleans. Those subscribers, however, never asked about 2,524 of the New Orleans mercantile establishments that the agency reported on, that represent 55 percent of the total number of firms in New Orleans. Including inquiries from branches outside of New York City, the total number of firms which no subscriber ever asked about only drops to 2,178.[47] Even for firms that subscribers inquired after, the Mercantile Agency provided more information than subscribers heard. The agency supplied 25,520 reports on the 45 percent of firms after which subscribers in New York City inquired. However, subscribers never heard 16,250 of these reports, 64 percent of inquired firm reports. Including the reports for firms that never had inquiries, the agency supplied 27,965 reports that no subscriber in New York City ever heard.[48] These numbers are also presented in Table 6.

Furthermore, there was usually a substantial lag between when the agency started reporting on a firm and when a subscriber first accessed a report for the firm. Conditional on the subscriber eventually inquiring after a firm, there were at least 3.7 years, on average, between when the agency first reported on the firm and when the subscriber first asked about the firm. Most of the time, when a subscriber inquired about a firm, they never heard another report for the same firm. Of the 15,029 times that a subscriber asked about a firm for the first time, only 4,256 inquiries were followed by at least one more inquiry.[49] Conditional on a subscriber having heard multiple reports about one firm, he waited at least 15 months, on average, between each inquiry.

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[46]See the online appendix for a breakdown

[47]The lack of inquiries for firms can't be explained by a lack of reports for firms without inquiries. Firms without inquiries had fewer reports on average than firms with inquiries but still enough reports for a subscriber to have inquired. See Table 3.

[48]The rest of the reports were not necessarily inquired after by other branches. If we add in inquiries from branches, there were still 24,337 reports that no subscriber ever heard.

[49]This is an underestimate because many firms continue beyond 1860 and I do not count subsequent inquiries beyond 1860.

The New Orleans cotton price series is from the New Orleans newspaper *Commercial Bulletin, Price Current and Shipping List.* I use the change in the monthly average interest rate in New York City on prime commercial notes with a four- to six-month maturity as a proxy for an aggregate shock to the New York City money market. As with the cotton price variables, I separate changes in the interest rate into an increase, *Pos∆IR*, and the absolute value of the decrease, *|Neg∆IR|*. The New York City interest rate series is collected from the New York City publications the *Journal of Commerce* and *Shipping & Commercial List, and New-York Price Current.* See Table 7 for summary statistics for the price of cotton and the interest rate between 1850 and 1860.

# 5   Empirical Strategy

To test the hypotheses laid out in the previous section, I investigate when subscribers first decided to access a credit report for a firm and how that timing depended on market and firm specific shocks. The first time a subscriber inquired after a firm, he could have been either screening the firm or checking on an existing contract.[50] Subsequent credit report inquiries were unlikely to be for the purpose of screening. I use survival analysis to estimate the number of months between when the agency started reporting on a firm and the month that a subscriber first heard a credit report. My empirical strategy allows me to exploit the fact that I observe when subscribers did and did not acquire information, an empirical setting unavailable during modern times. To do this I use maximum likelihood estimation (MLE) to test a duration model with time varying covariates.The exact dates of inquiries were time-interval censored, which poses a challenge for my estimation strategy. I adapt the standard duration model to correct for interval censoring of the inquiry date.

The Mercantile Agency records indicate that an inquiry of a particular report occurred between the date that a report was written and the date that the next report was written, not the exact date of the inquiry. For an example, see Figure 3. Suppose that the Mercantile Agency supplied reports on a firm in months *x*, *y*, and *z*. Next, suppose that a subscriber inquired after the firm at date $t^*$ and heard the report written on date *y*. In the data, we observe that the report written on date *y* had an inquiry. From the point of view of the econometrician, we only know that the true inquiry occurred at some point between *y* and *z*.

Interval censoring causes a problem because standard statistical techniques for understanding how variables affect the timing of events require knowledge of the exact dates of the events. Further, the high degree of variation in

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[50]A first inquiry could be for the purpose of state verification on an existing contract if the subscriber did not access a credit report to screen the firm prior to writing the contract.

interval lengths prevents me from standardizing observations by measuring inquiries at a lower frequency (for example, bucketing inquiries into six-month intervals instead of monthly intervals).

In the standard formulation of a duration model, we can write the likelihood of the data in terms of the hazard function. Let $p$ index the subscriber-firm pair $ij$. Let $t$ index the duration time in months since the Agency started producing reports about firm $i(p)$ of pair $p$. Let $\theta(t;X)$ be the hazard function, the probability that a subscriber $j(p)$ of pair $p$ inquired after the firm $i(p)$ at time $t$ conditional on not having inquired yet and time-invariant covariates $X$. If we observed exact inquiry dates $\{t_p\}$, then the likelihood function for a discrete time duration model would be:

$$\mathscr{L} = \prod_{p=1}^{P} \left[ \theta(t_p;X) \prod_{s=0}^{t_p-1} [1 - \theta(s;X)] \right]$$

If we include time-varying covariates (TVC), we can adjust the likelihood function accordingly: [51]

$$\mathscr{L} = \prod_{p=1}^{P} \left[ \theta(t_p;X(t_p)) \prod_{s=0}^{t_p-1} [1 - \theta(s;X(s))] \right]$$

However, since we do not know the exact date of the inquiry we cannot estimate the basic hazard model with TVC. To solve this problem, I assume that the inquiry was equally likely to have occurred at any point in the interval.[52] Let $\tau_p = [\tau_p^1, \tau_p^{K_p}]$ be the report interval for the first inquiry for pair $p$, where the inquiry could have occurred on any date in the interval. Assume that there was an equal probability, $\frac{1}{K_p}$, that the inquiry occurred at any month $\tau_p^k$ in the inquiry interval, then we can write the likelihood function:[53]

$$\mathscr{L} = \prod_{p=1}^{P} \frac{1}{K_p} \left[ \prod_{k=1}^{K_p} \theta(\tau_p^k;X(\tau_p^k)) \prod_{s=0}^{\tau_p^k-1} [1 - \theta(s;X(s))] \right]$$

The key to correcting for interval censoring in a duration model with TVC is that if there is positive probability that the inquiry occurred on the second month in the report window then the likelihood also must put positive probability that the inquiry did not occur on the first month. This complication is primarily a problem if there are time varying covariates.[54]

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[51] See Lancaster (1990) for assumptions on time-varying covariates.

[52] To use this method you have to assume some probability distribution over the interval. The uniform assumption is rather ad hoc. However, there is no particular reason to believe that an inquiry was more likely to occur at toward the beginning or the end of the report interval. In the online appendix I show parameter estimates under various other distributional assumptions.

[53] The estimation also accounts for left-censoring, when the firm's first credit report occurred before 1850. I exclude the censoring notation from the likelihood here for clarity.

[54] If the correct specification of the model is a hazard model with time interval censoring and time-independent covariates, we could use the NPMLE estimator.

There are many potential specifications for the underlying hazard function, $\theta(t; X(t))$. In this paper I adopt a parametric approach and assume that the baseline hazard follows a Weibull distribution. Under the Weibull assumption, the hazard function takes the form

$$\theta(t; X) = \frac{1}{\sigma}\lambda(X)\left[t\lambda(X)\right]^{\frac{1}{\sigma}-1}$$
$$\lambda(X) = \exp\{X\beta\}$$

The parameter $\sigma$ is called the scale parameter of the hazard function. The scale of the baseline hazard function tells us the average behavior for the timing of when subscribers typically obtain information about firms for the first time. When $\sigma$ is greater than 1, then the hazard function decreases with time. If the scale parameter is between 0.5 and 1, the hazard function increases with time at a decreasing rate. If the scale parameter is between 0 and 1, the hazard function increases at an increasing rate. Finally, when $\sigma = 1$ the baseline hazard is constant and the inquiry time follows an exponential distribution.

In my main specification I estimate $\sigma$ and $\{\beta_n\}$ using maximum likelihood estimation, under the following parameterization:

$$
\begin{aligned}
\ln(\lambda) = {} & \alpha + \beta_1^* FirmDefault_{i(p)t} + \beta_2^* PortfolioDefault_{pt} + \\
& \beta_3^* Pos\Delta IR_t + \beta_4^* |Neg\Delta IR|_t + \beta_5^* Pos\Delta CotPrice_t + \\
& \beta_6^* |Neg\Delta CotPrice|_t + Z_t'\delta + C_{i(p)}'\gamma
\end{aligned}
\tag{1}
$$

where $Z_t$ is a matrix of time varying controls. I include seasonal fixed effects (quarter dummy variables) and annual U.S. cotton production to control for the short- and long-run cyclicality of demand for trade credit. I include dummy variables for months in 1857 to ensure that my main results are not driven by the financial panic in 1857. I report the coefficients on these panic dummy variables in the results section. $C_{i(p)}$ is a matrix of firm specific controls including ethnicity fixed effects and industry fixed effects.[55]

I use a report of a default as a proxy for news of a potential default. $FirmDefault_{i(p)t}$ is equal to 1 between the dates $t_{i(p)}^1$ to $t_{i(p)}^k$ when a firm $i(p)$'s report at date $t_{i(p)}^1$ mentioned default. If the default was reported at date $t_i^1$ then the

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[55]Firm ethnicity is defined as the ethnicity of the firm's partners that the Mercantile Agency mentions in the credit reports. See the online appendix for summary statistics on firm ethnicity.

The annual U.S. cotton production series is from the NBER's Macroeconomic Time Series ICPSR 7644. All other control variables come from the Credit Report data.

default must have occurred before that date. Default in the credit reports means a default type event and includes such events as having a note protested, being sued, being "embarrassed," and being sold out by the sheriff.[56]

$PortfolioDefault_{pt}$ is a proxy for a the subscriber $j(p)$ receiving news of a default for some borrower, not $i(p)$, in his portfolio. I use prior inquiries of a subscriber to proxy for lending because I do not observe the subscriber's actual portfolio. If subscriber $j(p)$ inquired after some firms $\{d\}$ prior to date $t$ and the report for at least one firm, $d_k$, mentions default at date $t$ then $PortfolioDefault_{pt} = 1$, otherwise it is equal to $0$.[57]

I use the change in the price of cotton in New Orleans from the last month as a proxy for an aggregate shock to the New Orleans market. I separate the change in price into the increase in price over the last month, $Pos\Delta CotPrice$ and the absolute value of the decrease in price over the last month, $|Neg\Delta CotPrice|$ to distinguish between the effects of "good" and "bad" news about the cotton market on the probability of a subscriber inquiry.

# 6 Results

## 6.1 First Inquiries 1850-1860

Table 8 presents the exponentiated estimated coefficients, or hazard ratios, from Equation (1), where $HR = exp(\beta/\sigma)$. All specifications include dummy variables for quarter, dummy variables for months in 1857, and annual cotton production. The first column includes only changes in the price of cotton in New Orleans over the previous month. Column (2) contains only changes in the interest rate on commercial bills over the past month. The third column includes only variables relating to the default of the firm $i(p)$. Column (4) contains only a dummy variable for a portfolio default by some firm $-i(p)$ that subscriber $j(p)$ had inquired after in the past. The final column of the table presents the fully specified model.

For a hazard model with time varying covariates, the key to interpreting hazard ratios is to consider two subscriber-firm pairs, $p$ and $p'$, with identical histories up to some date $t$. All else being equal, if pair $p$ experienced the value $X_{tk}$ for covariate $k$ and pair $p'$ experienced the value $X'_{tk}$ then, at date $t$, the subscriber in pair $p$ is $exp\{\frac{\beta_k}{\sigma}(X_{tk} - X'_{tk})\}$ times more likely to inquire after his firm than the subscriber in pair $p'$ is to inquire after his firm. For example, suppose that at time $t$ a subscriber was considering whether to inquire after two different firms that had the exact same histories up

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[56]See the online appendix for a detailed breakdown of the default variable and summary statistics.

[57]For a firm to be included in the set $\{d\}$ at time $t$, the subscriber had to have inquired prior to date $t$ with probability 1. Hence, firms are not included in the set until after the end of the first inquiry interval.

to time $t$ and that the subscriber had not inquired yet. If one of the firms had recently defaulted at $t$ while the other had not, then, according to the estimated coefficient, we would expect that the subscriber was about 48 percent more likely to inquire after the firm that defaulted than the firm that did not. I plot the estimated baseline survival function and the estimated survival function after a firm default in Figure 4.

Columns (1) and (5) show that when a subscriber learned about a drop in the price of cotton in New Orleans, he was about 15 percent more likely to access a credit report about a New Orleans firm. However, he was slightly less likely to access a report after an increase in the cotton price. Controlling for defaults and the interest rate in New York City, the effect of a positive price change is statistically insignificant. This result supports the hypothesis that information acquisition was countercyclical: subscribers were more likely to access credit reports when the market was doing worse.[58] This suggests that creditors in the 1850s were not using credit reports for constant screening.

I find that subscribers were 5.7 percent more likely to inquire after a firm after a 1 percentage point increase in the interest rate on commercial paper from the previous month. This is consistent with a financial accelerator style model in which lenders seek higher quality lenders when they experience a liquidity shock.[59] If the interest rate on commercial notes increased, subscribers had to pay more to obtain liquidity in the form of discounting their commercial bills at the bank. As a result, they scrutinized their existing and potential borrowers more closely. Furthermore, a decrease in the interest rate increased the probability of an inquiry, although the effect is statistically insignificant when controlling for default and cotton-price fluctuations. This could imply that subscribers obtained more information about their borrowers in response to volatility in the interest rate. However, it is likely that the results related to interest rates in New York City are confounded by the role of banks in discounting bills and the banks' preferences for credit report inquiries.

Subscribers were 48 percent more likely to first hear a credit report for firm $i(p)$ if the firm recently defaulted. This is further evidence that credit report inquiries were more likely to be for the purpose of either anticipatory monitoring or state verification. The default mentioned in the credit report could either be against the subscriber that inquired or reflect general difficulty for the firm.

Subscribers were 51 percent more likely to hear the credit report for a firm if one of the subscriber's other borrowers defaulted.[60] This result could have two possible explanations, both related to the nature of aggregate shocks in this setting. An aggregate shock could take two forms: (1) a shock hit multiple firms simultaneously and affected all firms'

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[58]The asymmetric effect can be explained by the asymmetry of default on a debt contract.

[59]See Bernanke, Gertler, and Gilchrist (1996).

[60]A firm that was inquired after by a subscriber did not necessarily borrow from the subscriber. For simplicity, I refer to these firms as borrowers. In the case of portfolio defaults, firms that had an inquiry by a subscriber can be thought of as a proxy for an actual borrower of the subscriber.

ability to repay; or (2) one firm defaulted for a (possibly) idiosyncratic reason and, as a result, the firm's counter-parties in New Orleans were more likely to default.[61] From the perspective of the lender, these types of aggregate shocks may have been indistinguishable. One explanation for a positive effect of a portfolio default is that subscribers were reacting to some aggregate shock to New Orleans of the first type that I have not controlled for. Alternatively, the subscriber could have actively learned about the New Orleans market when he observed that one of his borrowers defaulted. The subscriber may have checked on other firms to determine if the default was an aggregate event or an isolated incident. The subscriber may have also inquired after other firms that he knew (or expected) were counterparties of the firm that defaulted. In Section 6.3, I further investigate what subscribers may have learned from a portfolio default.

## 6.2   First Versus Subsequent Inquiries

As mentioned earlier, it is unclear if a firm was already a debtor when a subscriber first accessed a credit report. It could have been that the subscriber contracted with the firm without hearing a credit report first or they contracted prior to the Agency writing reports about the firm. We can be fairly confident, however, that the subscriber and firm had an existing relationship if the subscriber heard a subsequent report about the firm.

In table 9, I compare the estimates for the time to first inquiry hazard model to estimates for a time to subsequent inquiry hazard model. For the subsequent inquiry model, the analysis time is measured as the number of months from the first report date after the last inquiry to the month of the subsequent inquiry. I include all subscriber-firm pairs in the analysis, even those for which the subscriber never inquired a second time. Hence, unlike the first inquiry model, pairs can be censored if the subscriber did not inquire for a subsequent time by the end of 1860.

Results are similar for both models except that a price drop seems to have had a slightly larger effect on the probability of a subsequent inquiry. Also, the interest rate on commercial notes seem to have little effect on the probability of a subsequent inquiry. While first inquiries might have been a subscriber inquiring after a potential or an existing borrower, subsequent inquires were more likely that a subscriber was inquiring after an existing borrower. Hence, the subsequent inquiry model estimates imply that subscribers monitored their borrowers when they received bad news. The similarity between these two models supports the notion that some of the first inquiries were actually subscribers hearing credit reports for existing borrowers.

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[61]We know from the text of the credit reports that firms were often "implicated" in the failures of other New Orleans firms.

## 6.3 Portfolio Defaults

Why did subscribers access credit reports for different firms when one of their borrowers defaulted? Did they learn about industry specific shocks? Did they learn about trouble in a particular social network? Were they more cautious about their portfolios after the first time one of their borrowers defaulted? In table 10, I further investigate the impact of a portfolio default on the probability that a subscriber inquired after a credit report. I estimate the Weibull hazard of first inquiry model under the following parameterization

$$
\begin{aligned}
\ln(\lambda) \quad = \quad & \alpha + \beta_1^* FirmDefault_{i(p)t} + \beta_2^* PortfolioDefault_{pt} + \beta_3^* Exposed_{pt} + \\
& \beta_4^* PortfolioDefault_{pt} \times SameIndustry_{pt} + \beta_5^* PortfolioDefault_{pt} \times SameEthnicity_{pt} + \\
& \beta_6^* PortfolioDefault_{pt} \times SameIndustry_{pt} \times Heard_{pt} + \\
& \beta_7^* PortfolioDefault_{pt} \times SameEthnicity_{pt} \times Heard_{pt} + \delta_t
\end{aligned}
\tag{2}
$$

where $PortfolioDefault_{pt}$ is defined as before; $Exposed_{pt}$ is a dummy variable equal to 1 if at least one firm that the subscriber $j(p)$ had inquired after prior to $t$ had defaulted; $SameIndustry_{pt}$ is a dummy variable equal to 1 if $PortfolioDefault_{pt} = 1$ and the firm that defaulted was in the same industry as the firm $i(p)$; $SameEthnicity_{pt}$ is a dummy variable equal to one if $PortfolioDefault_{pt} = 1$ and a partner in the firm that defaulted was of the same ethnicity as the firm $i(p)$; and $Heard_{pt}$ is a dummy variable equal to one if the subscriber actually heard the credit report that mentioned the portfolio default.[62] In this specification I drop all control variables and include only month-year dummy variables.

After a subscriber was exposed to a default of one of his borrowers, he was ever after more cautious about his portfolio in the sense that he was 15 percent more likely to hear a report for a firm.[63] However, subscribers still responded to individual portfolio defaults after being exposed. This result provides some evidence of the salience of default on lender behavior.

Subscribers were 51 percent more likely to inquire after a firm if a previously inquired firm in the same industry defaulted and 59 percent more likely to inquire after a portfolio default for a firm within the same ethnicity.[64] These

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[62]$Exposed_{pt}$ is different from $PortfolioDefault_{pt}$. If $PortfolioDefault_{pt} = 1$ for the first time at time $s$ then $Exposed_{pt} = 1$ for all $t > s$ and zero for all $t \leq s$.

[63]Under the Weibull assumption we can interpret the estimated coefficients in terms of a proportional hazard model or in terms of an accelerated failure time model. Hence, we can also say that subscribers waited less time before accessing a firm's credit report after one of his borrowers had defaulted.

[64]The overall effect of a same industry portfolio default is $1.273 \times 1.188 = 1.51$.

results suggest that subscribers did learn about specific industries or social networks through these portfolio shocks. However, subscribers were still 27 percent more likely to hear a credit report for a firm even if the portfolio default was in a different industry and ethnic group.

Finally, a subscriber did not actually have to access the credit report that mentioned a portfolio default for the default to affect how much information he acquired about other firms. This is further evidence that subscribers reacted to information that they obtained outside of the reports. Subscribers learned of the borrower default from one source and checked credit reports in response.

## 6.4   Panic of 1857

We've seen that subscribers accessed credit reports for borrowers after a bad aggregate shock to New Orleans or New York City. But how did subscribers react to an adverse financial shock that affects most of the country? To answer this question I turn to the financial panic that occurred in 1857. Most scholars date the start of the panic period as the end of August 1857 when the Ohio Life and Trust Company suspended Cincinnati. Throughout September and October, banks in several major cities in the Northern United States suspended payments.[65]

In all regression specifications, I included monthly dummy variables for months in 1857 to ensure that my results are not purely driven by the panic or the conditions that led to the panic in early 1857. Table 11 reports the hazard ratios for the panic dummy variables that correspond to columns (1) and (2) in table 9 (first versus subsequent inquiries). Surprisingly, the estimated panic hazard ratios imply that subscribers were, if anything, less likely to inquire after firms during the financial panic. This result is contrary to what we might expect during a financial panic, which is that financial market participants acquire too much information.[66] For example, in a bank run, depositors might withdraw their money from a bank to learn whether the bank is stable enough to sustain a run. However, depositors might produce "too much" information if too many people withdraw funds and cause an illiquid, but not insolvent, bank to fail.

There are several possible explanations for the result that subscribers were less likely to obtain information about firms during the panic. First, if subscribers often used credit reports to provide evidence of quality on a promissory note for a bank to discount, then we might expect inquiries to decrease when banks suspended in New York City. If banks

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[65]For more about the Panic of 1857 see Calomiris and Schweikart (1991).

[66]One way to think about a bank run is that depositors run on their bank to produce information about the quality of their bank. See Calomiris and Gorton (1991).

stopped discounting notes (as we know they did) then it would have been unnecessary for a subscriber to hear a credit report in order to convey the information to a bank. Second, it is possible that subscribers did not think they needed to inquire after particular firms because they assumed that every firm was in trouble. Finally, they may have merely been less likely to inquire about New Orleans firms because they were more concerned about firms in other locations. The online appendix reports the relative firm default rates during the panic for various American cities. We know, ex post, that New Orleans faired far better than most cities in terms of business failures and subscribers may have known this as well. Also, New Orleans banks did not suspend (except for two banks for a couple of days), which may have been a signal to lenders in New York City that business conditions in New Orleans were relatively stable compared with other cities. Further research into the experiences of other cities and the role of credit reports in bank note discounting will shed light on this finding.

## 6.5   Robustness Checks

All regressions included all industries. To make sure that none of the large industries drive the main results, I estimate the model excluding the main industries one at a time. The only case in which the results are sensitive to dropping an industry is with dry goods, when the coefficient on firm default increases. When I estimate the model using only dry goods firms, I find that subscribers were less likely to inquire after a dry goods firm after the firm defaulted. This explains why the coefficient for all industries is small relative to the portfolio default variable. This suggests that dry goods suppliers may have been more likely to use credit reports to screen potential borrowers, which is consistent with the number of inquiries there were for dry goods firms. See Table 12.

I estimate the main model under different assumptions of the baseline hazard distribution: allow the Weibull scale to vary by industry; assume a log-logisitic baseline hazard, a standard accelerated failure time distribution that allows for a hump shape in the hazard function; and use the Cox proportional hazard model which allows for a fully non-parametric baseline hazard. All of the qualitative results go through although, as expected, the magnitudes change slightly. See Table 13.

I also try various assumptions on the interval censoring corrections. Two extreme assumptions: all subscribers inquired on the date the report was written; and all subscribers inquired in the last month before the next report. Next, I assume that the probability of an inquiry over the report interval follows a beta distribution and use various assumptions for the parameters of the distribution. For all the specifications that I've tried, the default and portfolio default the main qualitative results hold. The cotton and interest rate results are sensitive to different assumptions on the timing of the

inquiry. However, there is no particular reason to assume that subscribers would be more likely to inquire on one of the interval than the other. In future work I will simultaneously estimate the hazard model and predict the likely inquiry date within the interval.

# 7 Conclusion

The goal of this paper has been to provide empirical evidence on how lenders acquire information about their borrowers through accessing credit reports. To do this, I have introduced a novel dataset compiled from the credit report records of the first mercantile credit reporting agency that allows me to observe approximately when New York City subscribers accessed credit reports about borrowers in New Orleans between 1850 and 1860. Using these data I have demonstrated three main facts about the way lenders acquire information. First, subscribers only acquired a fraction of the reports that the agency supplied, even though the information was inexpensive and easily available to subscribers. Second, when they did access credit reports, subscribers were more likely to do so after an adverse shock to the aggregate economy or the individual borrower. Finally, subscribers were more likely to acquire information about a borrower if one of the subscriber's other borrowers defaulted.

The results of this paper have a broader implication on how information constraints affect credit market outcomes. In a credit market in which lenders can only obtain information about their borrowers at a high cost, such as the pre-1841 mercantile trade credit market or the credit market in a developing country, my results suggest that costly information acquisition primarily causes the market to be inefficient when the economy is in a downturn. The information cost is less likely to bind when the aggregate economy is stable, or when it has collapsed, as in the case of a financial panic.

The results also point to the role that the Mercantile Agency played in the development of the nineteenth century US economy. Prior to the introduction of credit reporting, lenders obtained information about their borrowers through recommendation letters and word of mouth. These sources were sufficient to sustain lending during good times. In fact, lenders continued to use these sources after credit reports were introduced. However, my results suggest that these sources of information were insufficient when there were adverse shocks to the economy or to individual borrowers. Hence, credit reports primarily facilitated lending when the economy was less stable.

My findings also have broader implications for who has access to credit. Subscribers did not always check credit reports before they contracted, which suggests that lenders did not need all available information in order to lend. During goods times, suppliers extended credit freely with relatively little information. During bad times, they needed

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more information to lend. If a lender was uninformed when he contracted, he was necessarily less selective about to whom he extended credit. Hence, in boom periods, lenders provided broader access to credit. This could have benefited the broader economy because it meant that young firms —those limited ability to signal quality —did not have to prove they were good and were therefore more likely to obtain credit during a boom. This was particularly important for a developing commercial community like the mid-nineteenth century United States. Many of the mercantile establishments in the US at the time were young. If firms were required to provide proof of quality when they borrowed from suppliers, many firms would have been left out of trade.

On the other hand, this mechanism also likely increased access to credit for low quality borrowers. If lenders screened potential lenders closely they would not lend to some subset of firms, but during a boom the lender did not screen and ended up lending to some of the bad borrowers. If the bad borrower eventually defaulted then the subscriber was hurt in the long run. Further, I have shown that when one borrower defaults, the subscriber acquired more information about his other borrowers, which could lead to a systemic event. Introducing one bad borrower to a system that is so interconnected could increase the fragility of the system.

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Figure 1: Savannah Credit Report Ledger with Subscriber Inquiries
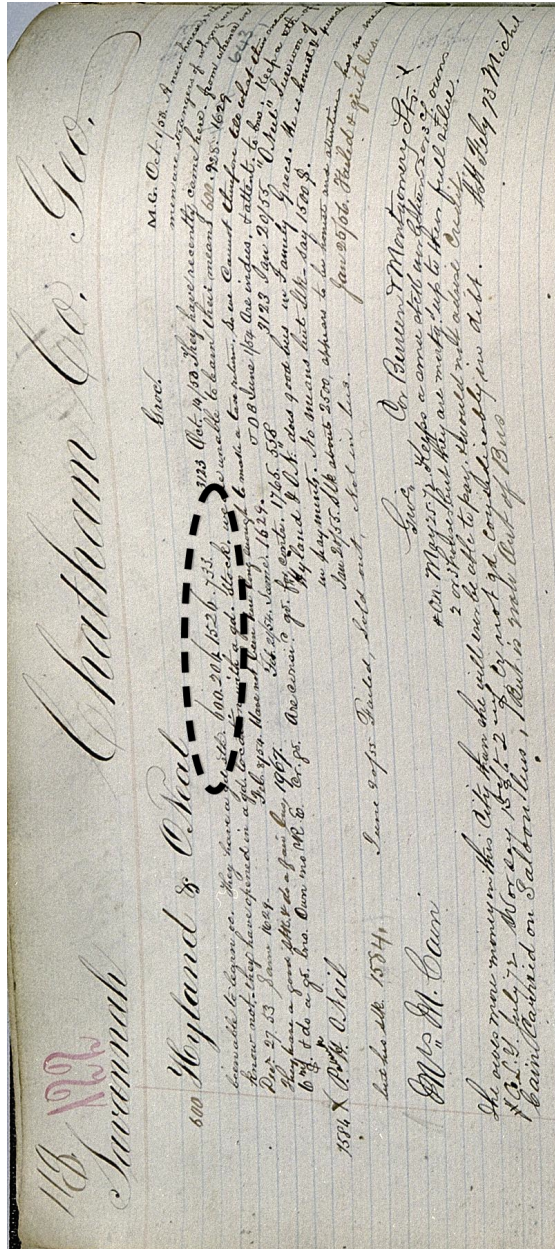


Source: Georgia Volume 28, page 122. R.G. Dun & Co. Credit Report Volumes.
Notes: Subscriber identification numbers indicating inquiries circled with dotted line. The circled numbers indicated that NYC subscribers 206, 1520, and 733 and the Baltimore branch (#600) inquired after Hyland & O'Neal between October 1, 1853 and October 14, 1853.

Figure 2: Report Dates and Inquiries for P. Adolphe Lanauze
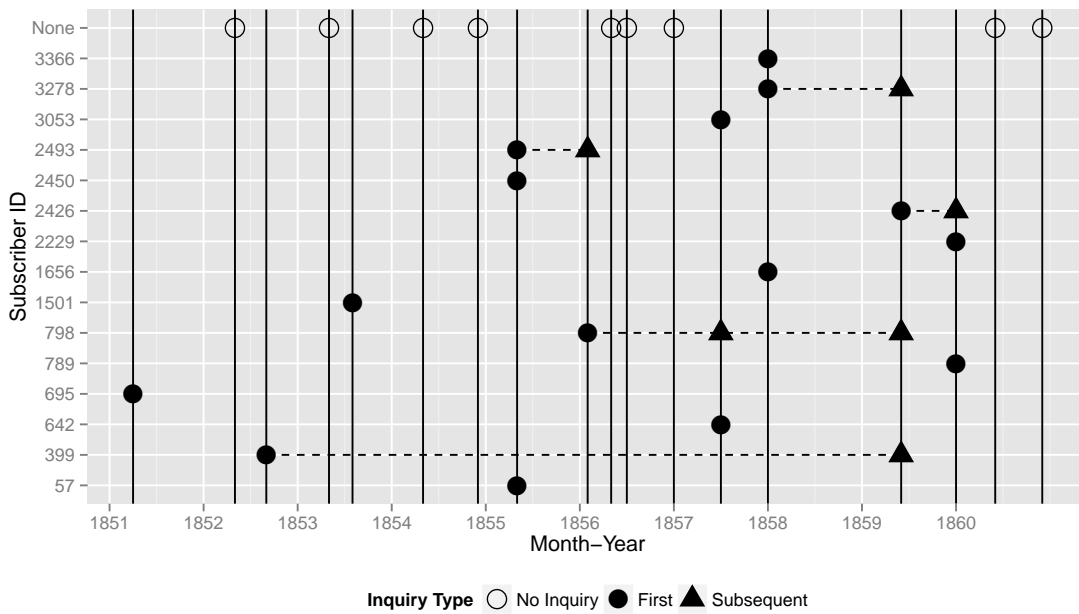


Source: Louisiana, Vol. 9, p. 358, R.G. Dun & Co. Credit Report Volumes.

Notes: Vertical lines indicate months on which the Mercantile Agency supplied reports for P. Adolphe Lanauze. Subscribers that inquired after Lanauze listed on y-axis. First credit report that each subscriber heard for Lanauze is marked with a circle at the month on which the report was written. Subsequent report inquiries marked with a triangle. The 9 reports for Lanauze that no subscriber heard are marked with an open circle.

Figure 3: Example of Time-Interval Censoring of Inquiry Date
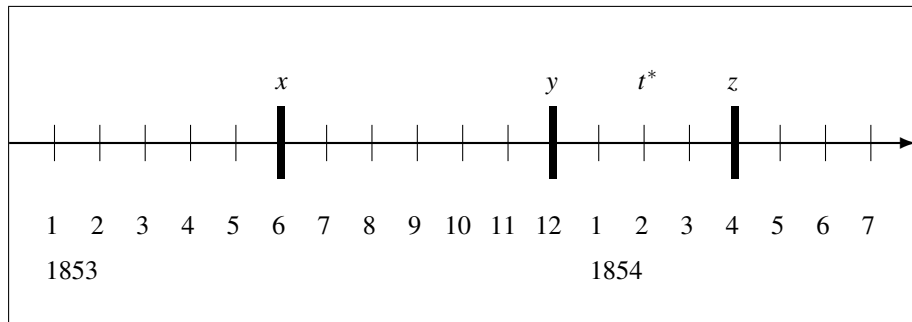


Notes: Suppose Agency supplied reports for a firm at dates $x$, $y$, and $z$. If a subscriber inquired about the firm at date $t^*$ and heard the report from date $y$ then we would observe that he had inquired some time between $y$ and $z$. We would not observe $t^*$.

Figure 4: Estimated Survival Function of Waiting Time to First Inquiry
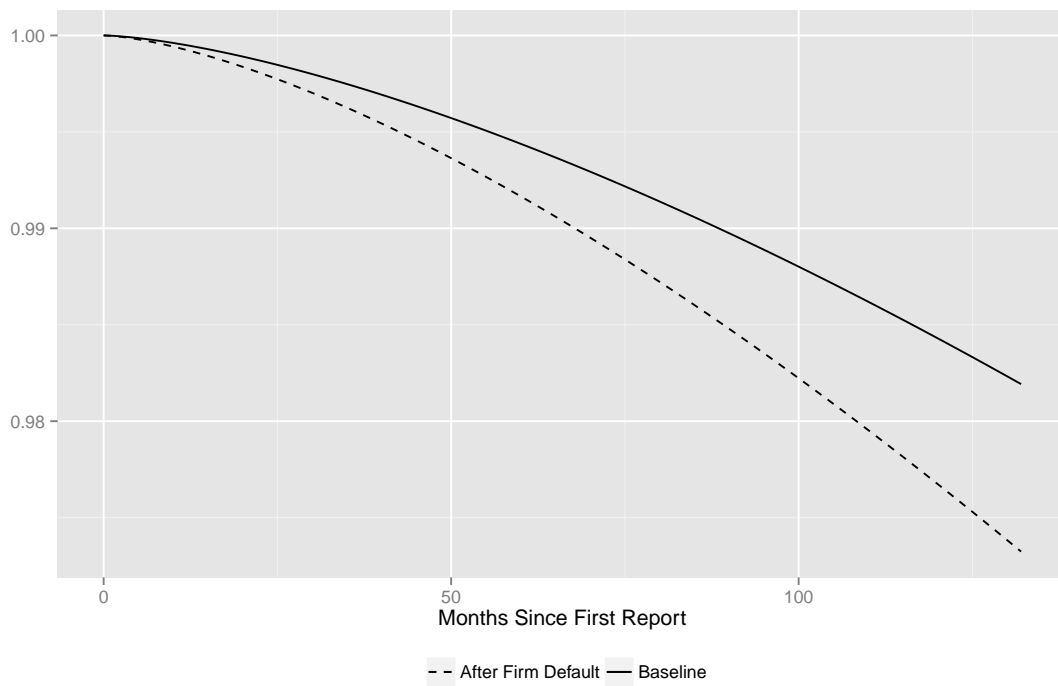


Notes: Estimated Weibull survival function based on parameter estimates found in table 8.

Table 1: Credit Reports and Inquiries of New Orleans Firms 1850-1860

|                      | Number |
|----------------------|-------:|
| Firms                | 4,584  |
| Reports              | 37,435 |
| NYC Subscribers      | 2,128  |
| NYC Inquiries        | 21,830 |
| NYC Inquired Reports | 9,270  |

Source: Louisiana, Vol. 9-12, R.G. Dun & Co. Credit Report Volumes. (New Orleans 1850-1860 Sample)

Notes: Firm included in sample if it had at least one report between January 1850 and December 1860. Sample includes all reports written about New Orleans firms between January 1850 and December 1860. Sample of subscribers includes all NYC subscribers that inquired after a New Orleans firm in the sample period. NYC inquiries are the total number of subscriber ID numbers that appeared after New Orleans credit reports. A report is an inquired report if at least one subscriber inquired after it.

Table 2: Credit Reports for P. Adolphe Lanauze

| Corr. | Date | Report and Subscriber Inquiries |
|---|---|---|
| PM | 4/25/51 | Been in business sometime. Has 2 stores joining. Worth about $30 thousand. Good and safe. There is no copartner. Creole Frenchman. 695 |
| C | 5/1/52 | Confirmed |
| | 9/1/52 | [No change] 399 |
| | 5/7/53 | Many years in the business. Considered good for $25 thousand. |
| DC | 8/13/53 | Good. 1501 |
| T | 5/28/54 | Frenchman. About 39. Married. In business on his account about 5 years. Was formerly in partnership with his brother "P.A.L." Of good character and habits. A good business man. Well acquainted with his business. He has a well assorted stock of about $15 thousand. Has a good run of customers. Cannot tell what he is worth but his credit is good and here is considered safe. |
| B | 12/29/54 | He is doing a good and prudent business on a fair scale and with adequate means. Has made money and holds real estate. Is safe and of reliable character. |
| | 5/1/55 | Is getting on as usual and is considered safe. Has experienced some reduction in his sales but is not affected by it. 2450 2493 57 |
| B | 2/1/56 | Doing a moderate business with adequate means and is good for his engagements. 798 2493 |
| 999 | 5/1/56 | 2 1/2 |
| CG | 7/1/56 | Business and credit good |
| D | 1/31/57 | Doing a small snug and safe business - credit modest. |
| | 7/20/57 | Doing a small and snug business. Has [loans] to the amount of $5 thousand to his brother P.A. Lanauze who has failed and gone into court. 798 3053 642 |
| D | 1/26/58 | Doing a small safe business and considered safe. 500 3278 3366 1656 |
| GPC | 6/23/59 | Close and prudent. Is assessed on capital for $2,000. Doing a fair business and has good credit. Owns nothing outside business. 3278 399 798 2426 |
| 999 | 1/16/60 | No change. Does a small trade of which his credit is a 2nd edition. Considered good for small business wants. 789 2426 2229 |
| N | 6/16/60 | Doing well and making money. Estimated to have considerable property (consider this information, in a measure, more reliable than former reports). |
| N | 12/19/60 | Considered sound and reliable. |
| N | 5/27/61 | Stands fair and well spoken of. Considered perfectly good for his wants. 4000 |

Source: Louisiana Volume 10, Page 358, R.G. Dun & Co. Credit Report Volumes.

Notes: List of reports does not include 5 reports after 1861. Unique subscriber ID numbers listed after text of reports.

Table 3: Summary Statistics for New Orleans Firms and New York City Subscribers

| A. Firms Inquired After by NYC Subscriber | | | | | |
|---|---|---|---|---|---|
| | N | Median | Mean | Max | SD |
| Reports | 2,060 | 11.0 | 12.4 | 50 | 8.7 |
| Years in Reports (between 1845 and 1890) | 2,060 | 9.9 | 11.2 | 47 | 8.1 |
| Years in Sample (between 1850 and 1860) | 2,060 | 5.0 | 5.5 | 11 | 3.7 |
| Inquiries | 2,060 | 3.0 | 10.6 | 314 | 20.2 |
| Reports with Inquiries | 2,060 | 3.0 | 4.5 | 32 | 4.9 |
| Maximum Inquiries for One Report | 2,060 | 2.0 | 2.9 | 35 | 3.4 |
| Subscribers Inquiring | 2,060 | 3 | 7.7 | 175 | 12.6 |
| Other Firms with Common Subscriber Inquiring | 2,060 | 74 | 113 | 747 | 121.5 |
| B. Firms Not Inquired After by NYC Subscriber | | | | | |
| | N | Median | Mean | Max | SD |
| Reports | 2,524 | 3 | 4.7 | 28 | 4.9 |
| Years in Reports (between 1845 and 1890) | 2,524 | 3.75 | 5.6 | 38 | 6.4 |
| Years in Sample (between 1850 and 1860) | 2,524 | 2.16 | 2.7 | 11 | 2.9 |
| C. NYC Subscribers | | | | | |
| | N | Median | Mean | Max | SD |
| Inquiries | 2,128 | 4 | 10.3 | 440 | 23.2 |
| Firms Inquired | 2,128 | 3 | 7.0 | 157 | 11.6 |

Source: New Orleans 1850-1860 Sample. See table 1.

Note: Only NYC inquired firms and reports. Reports and inquiries measured between January 1850 and December 1860. Years in reports measured between 1845 and 1894. Firms subscribers inquiring is the number of subscribers that inquired after the firm in the sample period. For each firm, unique network connections is the total number of other firms that share at least one inquiring subscriber.

Table 4: Months Between New Orleans Reports: 1850-1860

| A. Months Until Next Report by Report for All Firms | | | | | |
|---|---|---|---|---|---|
| Report Type | N | Median | Mean | Max | SD |
| All Reports | 32,778 | 5 | 5.6 | 100 | 5.13 |
| Inquired Reports | 8,592 | 5.00 | 5.8 | 80 | 4.83 |
| B. Months Until Next Report by Report for Firms with NYC Inquiries | | | | | |
| Report Type | N | Median | Mean | Max | SD |
| All Reports | 23,416 | 5.00 | 5.2 | 97 | 4.67 |
| Inquired Reports | 8,592 | 5.00 | 5.8 | 80 | 4.83 |
| Not Inquired Reports | 14,824 | 4.00 | 4.9 | 97 | 4.53 |
| C. Months Until Next Report by Report for Firms without NYC Inquiries | | | | | |
| Report Type | N | Median | Mean | Max | SD |
| Not Inquired Reports | 9,362 | 6 | 6.7 | 100 | 6.03 |

Source: New Orleans 1850-1860 Sample. See table 1.
Note: Statistics exclude last report for each firm prior to 1861.

Table 5: Industry Statistics

| Industry | Firms | Reports | Subscribers | Inquiries |
|----------|-------|---------|-------------|-----------|
| Boots & Shoes | 192 | 1,568 | 300 | 755 |
| Banking | 95 | 787 | 67 | 94 |
| Clothing | 325 | 2,355 | 418 | 1,641 |
| Comm. Merch. | 867 | 8,832 | 667 | 1,998 |
| Cotton | 295 | 3,578 | 334 | 895 |
| Drugs | 247 | 2,087 | 236 | 1,272 |
| Dry Goods | 308 | 2,827 | 888 | 5,655 |
| Furniture | 243 | 1,235 | 174 | 588 |
| Grocer | 522 | 3,706 | 427 | 2,043 |
| Jewelry | 159 | 1,380 | 263 | 945 |
| Liquor | 173 | 1,551 | 180 | 412 |
| Produce | 230 | 1,890 | 148 | 236 |

Source: Louisiana, Vol. 9-12, R.G. Dun & Co. Credit Report Volumes.

Note: Industries defined by author, based on reported industry in credit reports. Table does not include all industries. Firms could be in multiple industries at one time and could switch industries. Hence, the sum of firms over the industries is not equal to the total number of firms. Reports are total reports, not inquired reports. Only report NYC inquiries.

Table 6: Firms and Reports with Inquiries

|  | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
|  | N | Total Reports | Inquired Reports | % Reports Inquired |
| All Firms | 4,584 | 37,435 | 13,098[a] | 35% |
| Inquired Firms (by Any) | 2,406 | 28,793 | 13,098[a] | 45% |
| Inquired Firms (by NYC) | 2,060 | 25,520 | 9,270[b] | 36% |
| Not Inquired Firms (by Any) | 2,178 | 8,642 | 0 | 0% |
| Not Inquired Firms (by NYC) | 2,524 | 11,915 | 0 | 0% |

Source: New Orleans 1850-1860 Sample. See table 1.

[a] Reports inquired after by any subscriber, including branch subscribers.

[b] Reports inquired after by only NYC subscribers.

Notes: A firm is inquired (by Any) if a subscriber in NYC or at one of the Agency branches inquired after at least one report for that firm. A firm is inquired (by NYC) if a subscriber in NYC inquired after at least one report for that firm. The first column gives the number of firms in each category. The second column gives the total number of reports for firms in each category. Column (3) gives the number of reports inquired after for each category. Column (4) gives the percent of reports inquired after = Column (3)/Column(2).

Table 7: Summary Statistics: Aggregate Variables

| | Time Periods | Median | Mean | Min | Max | SD |
|---|---|---|---|---|---|---|
| New Orleans Cotton Price[a] | 131 | 10.25 | 10.2 | 7.0 | 15 | 1.7 |
| ΔNew Orleans Cotton Price[b] | 131 | 0.0 | 0.0 | -4.8 | 3.8 | 0.8 |
| NYC Interest Rate[a] | 131 | 7.2 | 7.8 | 3.8 | 27 | 2.9 |
| Δ NYC Interest Rate[b] | 131 | 0.0 | -0.0 | -11.0 | 9.15 | 1.9 |

Source: Cotton price from New Orleans Newspaper *Commercial bulletin, price current and shipping list*. From Sept. 1849 to Aug. 1855 the price is the cents per pound of Fair to Middling (quality) cotton on the first of the month. From Sept. 1855 to Aug. 1860 the price is the cents per pound on Middling (quality) cotton on the first of the month. NYC Interest Rate is the interest rate on prime endorsed business paper with 4 to 6 month maturity. The series from 1850 to August 1851 is from the *Journal of Commerce*. The series from September 1851 to Feb. 1857 is from the *Journal of Commerce, Junior*. The series from March 1857 to December 1860 is from the *Shipping & commercial list, and New-York price current*. The original interest rate series was at a (mostly) weekly frequency. The monthly rate is the mean rate over the month.
[a] Monthly frequency.
[b] One month differences.

Table 8: Maximum Likelihood Estimate of Weibull Hazard Model
Waiting Time to First Inquiry

| Dependent Variable: Time to First Inquiry | | | | | |
|---|---|---|---|---|---|
| | [1] | [2] | [3] | [4] | [5] |
| *Pos$\Delta$CotPrice* | 0.934* | | | | 0.951 |
| | (-2.378) | | | | (-1.74) |
| $\lvert Neg\Delta CotPrice \rvert$ | 1.146*** | | | | 1.152*** |
| | (4.799) | | | | (4.928) |
| *Pos$\Delta$IR* | | 1.064*** | | | 1.057*** |
| | | (4.244) | | | (3.713) |
| $\lvert Neg\Delta IR \rvert$ | | 1.039* | | | 1.029 |
| | | (2.457) | | | (1.802) |
| Firm Default | | | 1.488*** | | 1.487*** |
| | | | (6.813) | | (6.798) |
| Portfolio Default | | | | 1.527*** | 1.517*** |
| | | | | (13.139) | (12.862) |
| Weibull Scale | 0.671 | 0.672 | 0.673 | 0.671 | 0.656 |
| | (56.07) | (55.85) | (55.63) | (59.19) | (59.46) |
| Controls, Season FE | Y | Y | Y | Y | Y |
| Log likelihood | -116,523 | -117,050 | -117,118 | -117,105 | -116,418 |
| N | 730,374 | 730,374 | 730,374 | 730,374 | 730,374 |

*** p <0.001; ** p <0.01; * p<0.05

Notes: Table reports maximum likelihood estimates of time to first inquiry hazard model adjusted for interval censoring given by equation (1) in the text. Baseline hazard assumed Weibull. Hazard ratios are reported: one unit increase in variable implies first inquiry for subscriber-firm *HR* times more likely. t-statistics given in parentheses. All columns include controls: industry FE, ethnicity FE, annual cotton production, quarter dummy variables, and panic month indicators for months in 1857. See table 7 for definitions of NYC interest rate (*IR*) and New Orleans Cotton Price (*CotPrice*). Firm Default is 1 if latest report at date mentioned default. Portfolio default is 1 if report written at date for a previously inquired other firm mentioned default. See the online appendix for definitions of default.

Table 9: MLE of Weibull Hazard Model
Waiting Time to First Inquiry vs. Waiting Time to Subsequent Inquiry

| Dependent Variable: Time to Inquiry | | |
|---|---|---|
| | [1] | [2] |
| | First Inquiry | Subsequent Inquiry |
| $Pos\Delta CotPrice$ | 0.951 | 0.985 |
| | (-1.74) | (-0.373) |
| $|Neg\Delta CotPrice|$ | 1.152*** | 1.462*** |
| | (4.928) | (7.099) |
| $Pos\Delta IR$ | 1.057*** | 0.986 |
| | (3.713) | (-0.571) |
| $|Neg\Delta IR|$ | 1.029 | 0.943* |
| | (1.802) | (-1.963) |
| Firm Default | 1.487*** | 2.007*** |
| | (6.798) | (14.483) |
| Portfolio Default | 1.517*** | 1.665*** |
| | (12.862) | (14.278) |
| Weibull Scale | 0.656 | 0.505 |
| | (59.46) | (61.49) |
| Controls, Season FE | Y | Y |
| Log likelihood | -116,418 | -59,187 |
| N | 730,374 | 629,919 |

*** p <0.001; ** p <0.01; * p<0.05

Notes: Column (1) is the same specification as column (5) in table 8. Column (2) is contains the same variables as column (1) but is the estimated hazard model for time to subsequent inquiry. A subscriber-firm pair is at risk for a subsequent inquiry starting at the first month after the previous inquiry. Pairs without realized subsequent inquiries are included in the estimation.

Table 10: MLE of Weibull Hazard Waiting Time to First Inquiry
Portfolio Defaults

| Dependent Variable: Time to Inquiry | | | |
|---|---|---|---|
| | [1] | [2] | [3] |
| Firm Default | 1.779*** | 1.772*** | 1.774*** |
| | (9.907) | (9.832) | (9.855) |
| Portfolio Default | 1.524*** | 1.273*** | 1.278*** |
| | (12.369) | (4.318) | (4.101) |
| Exposed to Default | 1.157*** | 1.158*** | 1.159*** |
| | (7.114) | (7.139) | (7.174) |
| Portfolio Default x Same Industry | | 1.188** | 1.148 |
| | | (2.650) | (1.939) |
| Portfolio Default x Same Ethnicity | | 1.249*** | 1.220*** |
| | | (3.557) | (2.910) |
| Portfolio Default x Heard | | | 0.974 |
| | | | (-0.174) |
| Portfolio Default x Same Industry x Heard | | | 1.215 |
| | | | (1.167) |
| Portfolio Default x Same Ethnicity x Heard | | | 1.127 |
| | | | (0.717) |
| Weibull Scale | 0.628 | 0.628 | 0.628 |
| | (62.61) | (62.64) | (62.64) |
| Month-Year FE | Y | Y | Y |
| Log likelihood | -118,022 | -118,013 | -118,012 |
| N | 781,444 | 781,444 | 781,444 |

*** p $<$0.001; ** p $<$0.01; * p$<$0.05

Notes: Table reports maximum likelihood estimates of time to first inquiry hazard model adjusted for interval censoring given by equation (2) in the text. Baseline hazard assumed Weibull. Includes month-year fixed effects. Firm default and portfolio default are as defined in the appendix. A subscriber-firm pair is defined as "Exposed to Default" if at least one of the subscriber's previously inquired firms has defaulted (after "Portfolio Default" is equal to one month, "Exposed" is equal to one for the rest of the sample period). For firm $i$, "Same Industry" is a dummy variable equal to one if the portfolio default occurred in the same industry as firm $i$. "Same Ethnicity" is dummy variable equal to one if the portfolio default occurred for a firm with a partner with the same ethnicity as firm $i$. "Heard" is a dummy variable equal to one if the subscriber heard the report that mentioned the portfolio default.

Table 11: MLE of First Inquiry vs. Subsequent Inquiry
Panic of 1857 Indicator Variables

| Dependent Variable: Time to Inquiry | | |
| --- | --- | --- |
| | [1] | [2] |
| | First Inquiry | Subsequent Inquiry |
| February 1857 | 0.933 | 0.539*** |
| | (-0.744) | (-4.269) |
| March 1857 | 0.915 | 0.528*** |
| | (-0.929) | (-4.324) |
| April 1857 | 0.884 | 0.670** |
| | (-1.302) | (-2.939) |
| May 1857 | 0.801* | 0.611*** |
| | (-2.256) | (-3.313) |
| June 1857 | 1.029 | 0.623*** |
| | (0.339) | (-3.787) |
| July 1857 | 0.868 | 0.570*** |
| | (-1.768) | (-4.564) |
| August 1857 | 0.911 | 0.620*** |
| | (-1.113) | (-3.874) |
| September 1857 | 0.487*** | 0.788 |
| | (-4.683) | (-0.977) |
| October 1857 | 0.450*** | 0.567* |
| | (-5.248) | (-2.34) |
| November 1857 | 0.309*** | 0.221*** |
| | (-5.169) | (-3.748) |
| December 1857 | 0.613*** | 0.91 |
| | (-3.39) | (-0.41) |
| January 1858 | 0.537*** | 0.475*** |
| | (-6.013) | (-4.678) |

*** p $<$0.001; ** p $<$0.01; * p$<$0.05

Notes: This table presents the estimated coefficients on the panic dummy variables from columns (1) and (2) in table 9.

Table 12: Robustness Check: Industries

| Dependent Variable: Time to Inquiry | | | | | |
|---|---|---|---|---|---|
| | [1] | [2] | [3] | [4] | [5] |
| | All | No DG | No Cotton | No Grocer | No Comm |
| $Pos\Delta CotPrice$ | 0.951 | 0.941 | 0.951 | 0.948 | 0.948 |
| | (-1.74) | (-1.834) | (-1.718) | (-1.768) | (-1.764) |
| $\lvert Neg\Delta CotPrice\rvert$ | 1.152*** | 1.093** | 1.143*** | 1.164*** | 1.146*** |
| | (4.928) | (2.651) | (4.535) | (5.052) | (4.514) |
| $Pos\Delta IR$ | 1.057*** | 1.064*** | 1.059*** | 1.049** | 1.055*** |
| | (3.713) | (3.582) | (3.762) | (3.071) | (3.437) |
| $\lvert Neg\Delta IR\rvert$ | 1.029 | 1.030 | 1.030 | 1.025 | 1.028 |
| | (1.802) | (1.630) | (1.854) | (1.487) | (1.657) |
| Firm Default | 1.487 | 2.193*** | 1.420*** | 1.392*** | 1.357*** |
| | (6.798) | (12.644) | (5.719) | (5.438) | (4.747) |
| Portfolio Default | 1.517*** | 1.555*** | 1.508*** | 1.481*** | 1.503*** |
| | (12.862) | (11.490) | (12.260) | (11.525) | (11.872) |
| Weibull Scale | 0.656 | 0.674 | 0.659 | 0.649 | 0.657 |
| Controls, Season FE | Y | Y | Y | Y | Y |
| Log likelihood | -116,418 | -87,611 | -111,030 | -105,372 | -104,860 |
| N | 730,374 | 548,942 | 696,806 | 661,422 | 656,428 |

*** p <0.001; ** p <0.01; * p<0.05

Notes: Column [1] is the main specification, same as column [5] in table 8, and includes firms for all industries. Column [2] is the same specification but without Dry Goods firms; column [3] excludes cotton firms; column [4] excludes grocers. column [5] excludes commission merchants.

Table 13: Robustness Check: Baseline Hazard Assumption

| Dependent Variable: Time to Inquiry | | | | |
|---|---|---|---|---|
| | [1] | [2] | [3] | [4] |
| *Pos∆CotPrice* | -0.033 | -0.032 | -0.033 | 0.995 |
| | (-1.740) | (-1.753) | (-1.746) | (-0.175) |
| *\|Neg∆CotPrice\|* | 0.093*** | 0.094*** | 0.097*** | 1.214*** |
| | (4.928) | (5.173) | (5.101) | (6.718) |
| *Pos∆IR* | 0.036*** | 0.034*** | 0.036*** | 1.032* |
| | (3.713) | (3.622) | (3.633) | (2.086) |
| *\|Neg∆IR\|* | 0.019 | 0.018 | 0.017 | 1.011 |
| | (1.802) | (1.792) | (1.626) | (0.698) |
| Firm Default | 0.260*** | 0.250*** | 0.259*** | 1.509*** |
| | (6.798) | (6.727) | (6.597) | (7.063) |
| Portfolio Default | 0.273*** | 0.256*** | 0.278*** | 1.514*** |
| | (12.862) | (12.454) | (12.767) | (12.886) |
| Weibull Scale | 0.656 | Varies | - | - |
| Log-Logistic Scale | - | - | 0.651 | - |
| CoxPH | N | N | N | Y |
| Controls, Season FE | Y | Y | Y | Y |
| AIC | 232,972 | 232,597 | 233,175 | 334,356 |
| N | 730,374 | 730374 | 730374 | 730374 |

*** p <0.001; ** p <0.01; * p<0.05

Notes: Column (1) is the same as regression specification column (5) in table 8 but I report the standard coefficients (not hazard ratios). Column (2) is the same regression but allows the Weibull scale parameter to vary by industry. Column (3) gives results from the main specification assuming that the baseline hazard follows a log-logistic distribution. All coefficients are presented so that a positive coefficient means that an increase in the variable increase the probability of a first inquiry. Column (4) gives the hazard ratios from a Cox Proportional Hazard model.