CALCULABILITY AND TRUST:
CREDIT RATING IN NINETEENTH-CENTURY AMERICA

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ABSTRACT:

Credit ratings offer systematic, quantifiable measures of risk which allow investors and lenders to assess the creditworthiness of debtors and trading partners. The failures of rating agencies figured prominently in the current financial crisis. Use of credit ratings has spread around the globe but they originated in the U.S. during the 19th-century. Using a logistic regression analysis of data from a sample of 247 Chicago dry goods firms from 1879, we examine how well early credit ratings could predict undesirable outcomes like failure, insolvency and bankruptcy. Records from R.G. Dun & Co. allow us to link proprietary credit information with published credit ratings, and to determine how the latter were set. Results suggest that published ratings were unreliable and variably useful predictors of failure. In addition, credit raters possessed information that could not be quantified, or was not quantified, that also predicted failure. We list alternative uses of credit rating information that may explain its rapid spread, despite its predictive deficiencies, and show how these foreshadow rating agencies' recent problems.

The recent financial crisis provides a forceful reminder that modern economies depend on a background institutional infrastructure to support a complex global ecology of lenders, borrowers, investors and intermediaries. Virtually all public and private economic actors operate in a dense web of credit, and at the core of the system, sophisticated players process large volumes of quantitative information and deploy advanced risk-management techniques. When this infrastructure ceases to function, credit disappears, financial markets collapse, and the infrastructure moves sharply into the political foreground.

For-profit credit rating agencies like Moody's and Standard and Poor's (S&P) form a key part of this infrastructure, and their recent failure to assess the riskiness of complex financial instruments like collateralized debt obligations (CDOs) has prompted public condemnation and private litigation. Before the financial crisis, global investors eagerly purchased hundreds of billions of dollars worth of subprime mortgage CDOs that had received the highest rating from these reputable agencies. Unfortunately, it became clear in 2007 and 2008 that the ratings were grossly optimistic. Inaccurate ratings didn't just embarrass the rating agencies, however, for credit ratings are used pervasively by both private parties and public regulators in the governance of modern capital markets (Cantor et al. 2007, Langhor and Langhor 2008: 106, 431) and so rating agency mistakes propagated around the world. Until recently, the ability of rating agencies to operate for so long (over a century, in Moody's case) suggested that ratings had real value in measuring risk. Indeed, ratings resembled an advanced version of Weber's "rational capital accounting" (Weber 1981: 275-277). But now, after the crisis and in the midst of

financial regulatory reform, people wonder how rating agencies became so important, and why the information they produced became so significant to so many.

Contemporary rating agencies supply information to financial and commercial markets, and their current role is pervasive: around the world, corporations, organizations and sovereign governments that wish to borrow on bond markets are affected by the rating agencies. A high rating lowers the cost of capital, while a low rating raises it. Using a now-familiar ordinal category system that goes from "AAA" at the very top down to "D" at the bottom (S&P's labels), rating agencies distinguish between low-risk (i.e., low probability of default) and high-risk investments. Terms like "investment grade" or "below investment grade" are defined using rating agency categories. And it is clear that for ordinary corporate bonds, the rating agencies provide useful information: empirically, the default rates for AAA-rated bonds are very low, and default rates increase steadily as ratings get lower (Standard & Poor's 2009: 4-5). However, with financial deregulation in recent decades (Krippner 2005), rating agencies expanded to rate new types of instruments and mistakenly bestowed high ratings on risky CDOs.

The technical activities of modern rating agencies seem mysterious. Exactly how ratings are calculated, and from what kinds information -- qualitative and quantitative, hard and soft, public and private -- is proprietary. Rating agencies have no interest in telling the world exactly how they do this, but they clearly take a very large volume of information and radically reduce it to a simple, summary measure. In the period before the crisis, internal rating methods were not always explicit, formalized or fully documented. And the agencies didn't always conform to their own procedures (SEC

2008: 14-16). Except in broad outline (see Langohr and Langohr 2008: 161-187), the internal workings of rating agencies are poorly understood.

Despite their centrality in modern financial capitalism, and starring role in recent events, little research has been done on credit ratings outside of economics. Financial economists have studied ratings in microscopic detail, addressing very specific issues such as the effect of split ratings (where different agencies give different ratings to the same security), the relationship between rating changes and stock market prices (see, e.g., Livingston et al. 2008, Dichev and Piotroski 2001, Kliger and Sarig 2000), or their performance in predicting default (Flandreau et al. 2009). But in the rest of social science only a handful of sociologists, political scientists, or legal scholars have considered the broader role and significance of credit ratings (e.g., MacKenzie 2009, Miller 2003, Partnoy 1999, Poon 2007, Rona-Tas 2009, Sinclair 2005). Here, we examine the emergence of credit rating in the 19th century, and use this to help understand its role in the 21st century. We will argue that early credit ratings were regarded as useful economic information, in part because they were more formalized, systematic and quantitative than the traditional alternatives. But a number of factors operated behind the evident simplicity of ratings, and these complicated just how useful ratings could be in ways that foreshadowed the current crisis. Quantitative information connotes precision and neutrality, indeed that is the basis for its legitimacy (Porter 1995), but credit rating was driven by other considerations as well. Our analysis of early ratings will reveal that concerns over intellectual property and legal liability shaped their performance as measures of risk.

This paper exploits the fact that credit rating long predates the founding of Moody's and S&P in the early 20th-century. Credit reporting emerged in the U.S. during the 1830s when the precursors of Dun and Bradstreet advised merchants and other would-be lenders about who they could trust. The focus then was on short-term rather than long-term borrowing, but the problem was similar: lenders wanted to know who could be trusted to repay a debt. Who was most likely to default? Then, as now, the economy depended on credit, and individual businesses typically borrowed from their suppliers and bankers, and extended credit to their customers. Credit was crucial, which made the problem of how to recognize creditworthy borrowers inescapable. Then, as now, lenders wanted to avoid lending to untrustworthy borrowers, but it was hard to tell who was truly trustworthy. In the parlance of modern economics, reporting and rating agencies provided transparency and helped to resolve the information asymmetries that afflicted credit markets (Stiglitz 2000).

Nineteenth-century credit raters provided information to their clients, and invented the form that Moody's and S&P later adopted and still use: ordinal categories. Clients then used the ratings to help decide whom to trust. Since this activity began when the value of credit ratings was anything but self-evident, their usefulness and legitimacy had to be *established*. The form credit raters adopted eventually spread far beyond its origins in trade credit, to bank lending, credit insurance, then to railway and corporate bonds, domestic and foreign sovereign debt, and eventually to individual consumers, who now have their own "credit scores" (Marron 2007, Jeacle and Eamonn 2002, Afonso 2003, Fight 2001, Berger et al. 2005). Nineteenth-century credit ratings, with their

distinctive role and format, eventually "locked in" and became a pervasive part of 20th-century credit infrastructure.

In addition to its contemporary relevance and historical significance, credit rating brings together several different lines of research. Recent work in the sociology of finance has put the spotlight on the performative aspects of various devices and techniques used in modern financial markets (e.g., MacKenzie and Millo 2003 on the Black-Scholes option pricing model). According to these arguments, the explicit theories that people devise about market behavior are not simply true-or-false descriptions of an independent economic reality. Rather, they are enacted, performed and assessed so as to become more or less true. Ratings in the 19th-century allow us to examine performativity in a very different context, long before the development of the discipline of financial economics. Indeed, the performative quality of ratings was at the heart of litigation that troubled the rating agencies over many decades, as plaintiffs accused the agencies of giving them falsely low ratings that *became* true because of the effect on creditors' behavior.

Credit rating is also a method to determine who is trustworthy, and so raises questions familiar to scholars studying trust (Cook, Hardin and Levi 2005), social capital (Fukuyama 1995, Putnam 1993), or how social intermediation regulates trust (Shapiro 1987), shapes economic uncertainty (Beunza and Garud 2007), and constructs hierarchies of status and reputation (Sauder 2006). Heimer (2001) identifies uncertainty as one of two core elements of trust (vulnerability is the other), and so it is natural to wonder how ratings engaged uncertainty in credit relations. Credit ratings can be viewed as a device that dealt with trust outside of the oft-studied context of embedded ties and personal

social networks. Cook, Hardin and Levi (2005: 31) argue that cooperation in complex societies cannot depend only on the trust relations that small communities and dense social networks beget. Credit ratings are an opportunity to test such an argument, for the rating agencies wanted to get their clients to worry less about trusting borrowers by learning to trust the rating agencies.

Another relevant literature focuses on the significance of quantification, for in supplementing more relationally-embedded methods for the assessment of trustworthiness, credit ratings marked an important step toward quantitatively-based decision-making (Porter 1995, Power 1997, Espeland and Stevens 2008). In broad Weberian perspective, credit ratings enhanced calculability and supported the overall rationalization of the economy (Weber 1981: 275-278, Swedberg 1998: 37). Alternatively, credit ratings can be seen as part of a rationalized "world culture" (Boli and Thomas 1997, Meyer and Rowan 1977), as the institutionalization of expertise of "cultures of prediction" (Evans 1999, Fine 2007, Preda 2007), or as an important element in the formation of an "audit culture" (Power 1997, Strathern 2000, Rose, O'Malley and Valverde 2006).

Other scholars have examined the importance of categorical knowledge as sense-making devices in financial markets, pointing out that firms which fit comfortably into pre-existing classification systems enjoy a premium over those which do not (Zuckerman 1999). Recently, Ruef and Patterson (2009) extended this analysis by examining the effects of newly-established and still unsettled category systems. Here, we can consider the invention of the category system in the first place, before it became legitimate and

taken-for-granted. What factors shaped the formation, rather than application, of category systems?

We use unique historical data to analyze how early credit reporting and rating worked, and to understand the genesis of this key part of the infrastructure of the modern economy. Nineteenth-century "mercantile" agencies successfully developed and commodified a new type of information, and its format was adopted by bond rating agencies in the early 20th-century. Their success was apparent from the overall growth of the rating industry and the organizations within it. The information they created and sold found a ready market and expanded into new niches and uses. With our data, we are able to link the confidential information possessed by an agency about particular businesses with the ratings they issued and sold to clients, and so learn about how the ratings were created and how well they could "predict" credit problems (Sandage 2005: 111). We will see that despite widespread agreement that ratings were "useful," and notwithstanding their position as predecessors of today's rating agencies, *how* ratings were useful didn't depend only on their narrow "predictive" qualities, but also on their status as intellectual property, the legal liabilities they entailed, and the legitimacy they conferred on the agencies. This offers a more general precautionary lesson about quantification: the key issue may not concern accuracy or precision. Porter (1995) has made a similar point with respect to public policy decision-making, but here we extend it to capital markets, the calculative heart of capitalism.

Credit and Trust:

Creditworthiness has long been a crucial but mysterious quality. It remains as true today as in the past that most businesses must both give and receive credit in order to survive (Balleisen 2001: 28-29, Finn 2003). Even solvent, profitable firms require credit just to keep operating. And if credit is crucial for individual firms, it is equally important for the operation of national economies. Without credit, market exchange reverts to barter or to "cash-only" trade (Hoppit 1987: 133-34; Earle 1989: 115), or simply ceases.

Information is central to markets. Buyers and sellers want to know about the prices, quantities, and qualities of commodities, and they want to know if their trading partners are trustworthy. By gathering information, market actors try to transform uncertainty into risk, or better yet, into certainty (Guseva and Rona-Tas 2001). Credit markets are particularly vulnerable to information asymmetries, as economists call them (Stiglitz 2000), because borrowers know much better than lenders how willing and able they are to repay a loan, and it is hard for borrowers to credibly signal their trustworthiness. From the lender's standpoint, it was good to lend to creditworthy borrowers, but not to the uncreditworthy (who were more likely to default). Thus, businesspeople were concerned with differentiating between those deserving, and those unworthy, of credit.

During the 18th and 19th-centuries, credit in Anglo-American economies was construed in largely personal terms (see, e.g., Defoe 1726, Earling 1890: 35, Grassby 1995: 299-300). Assessing creditworthiness and trustworthiness involved investigating the personal character of potential debtors (Hilkey 1997). The problem for the creditor was how to discriminate between the trustworthy and the untrustworthy. This was a challenging exercise in practical psychology -- which outward signs revealed someone's

true character? These assessments were more easily performed in small, stable communities in which people and their personalities were easier to know, where reputations circulated rapidly and reliably, and where credible information was available from multiple sources (Mann 1987: 41-42, Mann 2002: 7). Personal social relationships and direct network ties offered insight into an individual's character.[1] Thus, lenders used their social networks. For example, ante-bellum New England banks seldom made arms-length loans but instead engaged in "insider lending" to connected borrowers (Bodenhorn 2002: 72-94, Lamoreaux 1994, Olmstead 1976: 118).[2]

As U.S. trading networks expanded geographically during the 19th-century, firms found it more difficult to rely solely on informal networks and local reputations for their information.[3] U.S. commerce occurred increasingly *between* communities rather than just *within* them. New York City merchants sold to customers in the Midwest rather than nearby Poughkeepsie. Insolvency and near-insolvency were as important to know about as before, but old methods for gathering information wouldn't work as well.[4] A seller would ship goods to a customer and await payment after some conventional period of

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[1] The smallness of communities need not be geographical. For example, reputations circulated within the numerically small but dispersed 19th-century British shipping industry, and influenced lending and transactions (Boyce 1995: 4, 231).

[2] See also Weber's discussion of an early 20th-century Baptist congregation in North Carolina, where membership in the congregation was interpreted as a guarantee of a person's moral quality and creditworthiness (Weber 1946: 305).

[3] Of course, people still use information obtained through social networks to resolve uncertainty (Mizruchi and Stearns 2001, Uzzi 1999), but they do not rely upon it solely.

[4] Insolvency was believed to be ubiquitous. One commentator claimed that 97 out of every 100 merchants would fail at some point (Old Merchant 1873: 3). True or not, such claims bolstered demand for credit reporting (Sandage 2005: 6-7).

time (60 days, six months, etc. depending on the market). During the interim, the buyer

was indebted to the seller. Merchants undertaking long-distance trade sought new sources

of information about creditworthiness, information that didn't derive from a lender's

personal contacts in small communities, dense social networks, or the local reputation of

debtors (Bryan 1883: 10-11, Homans 1859: 1344-45, Prudden 1922: 2). The traditional

solution, sending clerks on expensive long-distance trips to collect debts and investigate

customers, was impractical on a large scale (Sandage 2005: 107). The problems of long-

distance trade were especially acute for two additional reasons: trade credit was

unsecured (i.e., there was no collateral to seize in case of default), and local courts often

discriminated against out-of-state creditors (Olegario 2006: 9, 30, 96).

      Credit agencies offered a new solution to this informational problem, first in the

form of reports and then increasingly in the distinctive idiom of quantitative

measurement. Starting in the 1840s, credit agencies like Lewis Tappan's Mercantile

Agency (later R.G. Dun & Co.), Woodward and Dusenbery's Commercial Agency (later

McKillop-Sprague and Co.), and J.M. Bradstreet and Son's Improved Mercantile

Agency,[5] offered credit information to merchants who wanted to know about the

trustworthiness of others (Madison 1974).[6] As the Mercantile Agency put it, they

provided information to its subscribers to help them know who was "safe to trust" or

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[5] Tappan's Mercantile Agency dates from 1841, Woodward & Dusenbery opened
for business in 1842, Bradstreet's started in 1849 or 1850 (Sandage 2005: 121). These
firms were predated by a service run by Sheldon P. Church, and a fairly short-lived
agency -- Griffin, Cleaveland and Campbell -- which began operations during the 1830s.
The Bradstreet and Dun agencies merged in 1933.

[6] The financial panics of 1837 and 1839 combined with the passage of bankruptcy
legislation in 1841 may have been the proximate cause for the increased number of
entrants into the credit reporting field, for these economic and legal events made the
problems of credit management especially salient (Balleisen 2001: 146).

"safe to sell" while at the same time who was "safe" or "wise to avoid."[7] Building up an elaborate system of local correspondents and branch offices, the Mercantile Agency gathered information about tens of thousands of firms, codified, organized and processed the information, and made it available to its clients. On a mass scale, the Agency helped to make sense of creditworthiness by commodifying its own expertise (Abbott 1991).

Despite greater reliance on credit information and other precautions, lenders invariably made mistakes. By analogy with hypothesis testing, we can distinguish between "type I" and "type II" errors. Creditors can mistakenly extend credit to someone who is not creditworthy (type I), or mistakenly deny credit to someone who is truly creditworthy (type II). For issuers of trade credit, type I errors were much worse than type II errors as the losses associated with an unpaid loan were greater and more visible than the opportunity cost of foregone profit. Type I errors meant that a firm extended credit to someone who subsequently defaulted, and creditors were lucky to recover cents on the dollar. Credit information was supposed to help lenders to avoid making errors of both types, but particularly to avoid type I mistakes. Therefore predictability in some sense was at the heart of how reports and ratings were used. However, as much as mercantile agencies wanted their customers to use their information, they also avoided making promises that were too ambitious or explicit (except when they were comparing themselves to their competitors). An unambiguous statement about a particular firm could well prove unambiguously false.

In addition to losing money, mistakes sometimes resulted in complaints and lawsuits. Mercantile agencies worried about being sued, and so were concerned about the legal status of the information they distributed. The clients of mercantile agencies would

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[7] Mercantile Agency ads, *Hartford Courant*, April 8, 1870, p. 2; *New York Times*, January 20, 1870, p. 3.

usually complain about high ratings given to firms which received credit and

subsequently defaulted, and rated firms would complain about low ratings (which meant

they were denied credit, and were hurt economically). In other words, credit-rating clients

worried about type I errors, while rated firms worried about type II errors. Formal

contracts with clients developed over time to absolve the agency from liability in relation

to its clients, but it was harder to deal with legal challenges coming from the rated firms.[8]

The Mercantile Agency

Lewis Tappan founded the Mercantile Agency in 1841.[9] He recruited a network

of correspondents from around the country, who submitted reports to the head office in

New York City. Within five years the Agency had 679 correspondents, and within ten it

had almost 2,000, although coverage was spottier in the South because of Tappan's

abolitionist connections (Sandage 2005: 101). Most of these correspondents were local

attorneys, who received referrals for collection work in exchange for sending information

to the Agency. Tappan initially charged his subscribers on a sliding scale that depended

on their annual sales. Subscribers with less than $100,000 in sales were charged $100 for

a year while those with sales above $500,000 paid $300 (Norris 1978: 20-21). After 1878

the sliding scale was abandoned and the basic subscription (two rating books per year and

100 reports) cost $75, with additional reports or rating books costing more (Norris 1978:

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[8] For relevant law regarding contracts and type I errors see Errant (1889: 48-51, 59-61) and Olegario (2006: 152-153). For relevant law regarding "privileged communications" and type II errors see Errant (1889: 27-38).

 [9] The Mercantile Agency changed owners and names several times: Lewis Tappan & Co. 1841-1849, Tappan & Douglass 1849-1854, B. Douglass & Co. 1854-1859, R.G. Dun & Co. 1859-.

141).[10] Large and frequent users of the Agency's services might pay several thousand dollars per year.

Until the early 1850s, mercantile agencies distributed information as written or verbal reports. Starting in the late 1850s, first Bradstreet's and then Dun began to publish rating or "reference" books, organized by location and giving an alphabetical listing of all businesses together with summary information about their creditworthiness.[11] After 1873, R.G. Dun's Reference Books were issued four times a year, reflecting both the growing demand for up-to-date information on as many firms as possible, and competition between credit raters.[12] The format of the Reference Books balanced the demand for accurate assessments with the need for simplicity, comparability, and the appearance of rationality (meanwhile providing an incentive for subscribers to contract for special written reports containing more detailed information; Norris 1978: 141-43).

The abstract information provided in the Reference Books had several practical consequences when the clients of the Mercantile Agency used them to make credit decisions. Information about creditworthiness allowed creditors to compare firms and decide who to lend to. The significance of this information grew as the number of firms rated in the R.G. Dun reference books expanded from about 20,000 in 1859 to over 1,100,000 in 1890 (Norris 1978: 110). Figure 1 illustrates the rapid increase in the scope

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[10] By charging clients rather than the firms being rated, Dun anticipated the business model of bond rating agencies before the 1970s (Kerwer 2005: 468).

[11] Bradstreet's first issued ratings in 1853 on a monthly-issued sheet. The first books were simply compilations of these sheets.

[12] Customers continued to obtain detailed oral and written reports about specific firms by application at the Agency's branch offices, but for general knowledge they increasingly relied on the rating books, which contained only summary information. Indeed, rating agencies implored their clients not to rely so heavily on the reference books.

of the knowledge produced by credit raters as well as their own organizational growth: not only did the number of rated firms increase dramatically, but Dun itself grew substantially over the course of the century.

[FIGURE 1 ABOUT HERE]

At various times, two of the three leading agencies made public claims about the predictive power of the information they provided -- to "foresee," "premonish," "foreshadow" or "guard against" failures or "embarrassments."[13] The Mercantile Agency's 1861 Circular explicitly touted that their credit records "premonished" 2666 of 3676 business failures (73%) across the U.S.[14] Whether such specific claims were right or not (it isn't clear how the 73% figure was calculated), the explosive growth in this industry strongly suggests that clients found the information valuable. Certainly that is what some contemporaries believed: "In fact, the entire success of the [credit reporting] system depends upon the general truthfulness and justice of their records – upon having every report they give out verified by the results to which it leads." ("The Mercantile

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[13] Respectively: John M Bradstreet's Mercantile & Law Agency, October 11, 1853, "On an Improved Plan" (circular to prospective subscribers), Cincinnati; Dun, Boyd & Co., January 1861, "Statistical Table Accompanying their Annual Circular for January, 1861," New York and Dun, Boyd & Co. advertisement, "Special Notice. To Merchants and Bankers ... Reference Book," *New York Tribune*, January 25, 1861, p. 1 ; "The Commercial Agencies," February 27, 1885, *Boston Daily Advertiser*, p. 2; "Financial. Commercial Failures," *The Independent*, March 16, 1893, p. 23. The 1885 and 1893 articles both are claims that Bradstreet's made; the latter specifically points to ratings as being predictive.

[14] Usually the Mercantile Agency was more subtle and did not baldly assert that its ratings could be used to predict failure. After all, such explicit claims might have antagonized the rated firms, and bolstered grounds for legal action by subscribers who lost money by following reports or ratings.

Agency," <u>Merchants' Magazine and Commercial Review</u>, January 1851, p.48). Thus it *appears* that credit reports and ratings served their ostensible purpose: to inform users of the creditworthiness of firms and so enable users to avoid lending to firms likely to default. The claims of the Agency combined with the growth of the market suggest an obvious hypothesis, namely, that *credit information possessed predictive value*. Although the statistical methods necessary to test such a hypothesis were unavailable to the Mercantile Agency and its customers, they are available to us.

Data

For practical purposes, given the massive volume of information collected and processed by early credit raters, it is necessary to sample from the surviving records. Using the R.G. Dun records (Baker Library, Harvard University Business School), we examine how business failure and other information were measured and recorded in the internal records of the R.G. Dun Company (and its predecessor, the Mercantile Agency). We also track how credit information was organized and simplified into published ratings.

The hand-written Dun office ledgers and the printed Dun Reference Books are our primary source of data. We drew our sample from the Chicago dry goods industry because firms were typically small and firmly embedded in a complex credit network extending upstream to wholesalers and suppliers, and downstream to customers.[15] Failure

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[15] As well, the Mercantile Agency, like its competitors, considered the dry goods trade to be one of its core constituencies, and had saturated coverage of that market from the beginning.

was common in this industry so creditors had to be ever mindful of the possibility of insolvency. (Dry goods merchants traded in a broad range of textiles and textile-related goods, and were the precursors of the modern department store, e.g., Marshall Field began as a dry goods merchant in Chicago.) Within the dry goods industry, we focused on firms in business in 1879, the trough of a long economic contraction. We aimed to maximize the stress of insolvency by sampling at the bottom of the business cycle. Furthermore, this date comes almost 40 years after the establishment of the Mercantile Agency, so we are not studying an infant industry.

Ledger reports of 247 Chicago dry goods retailers were selected, consisting of all of the dry goods firms listed in the 1879 <u>Lakeside Directory of Chicago</u>. The confidential ledger information on each firm was encoded and linked to the credit ratings published in the Dun reference books, as well as the ratings published by two rival credit raters: Bradstreet's and McKillop-Sprague.[16] Ratings given to sampled firms both before and after 1879 were also included in the data set. Thus, we have seventeen paired ratings of the pecuniary strength and general credit of dry goods firms from Bradstreet's in 1875 and 1879, McKillop-Sprague in 1877, and Dun in January and July 1875, 1876, 1877, 1878, July and September 1879, January and September 1880, 1881, January, July and September 1883, and 1884. Missing values are not infrequent, but this problem is typical even for modern credit rating data (see Hand and Henley 1997: 528).

Sources and Uses for Credit Information

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[16] To the best of our knowledge, no ledgers of McKillop-Sprague or Bradstreet's have survived.

How Dun solicited information from its informants, and communicated with clients, reveals what Dun wanted to know, and what it thought its customers should do with its information. The Agency recognized that the value of information was ephemeral, and so it urged its correspondents to pass on what they learned with all due speed. And the Agency wanted to know what the correspondents knew about business failure: "In endeavoring to secure business for you, our *power* is derived from your *promptness*. If you are careful to advise us at once of all failures, premonitions of failure, &c., in your District, we have little doubt of being able to control for you a remunerative business." (Office of the Mercantile Agency New York 1852, ca May/June Circular letter to correspondents). The Agency also exhorted its sources to communicate whatever information they could obtain about firms, even if not of the highest quality: "We know that it is often impossible to give <u>definite</u> reports of strangers and we do not expect this, but you can give us your <u>impressions</u> about them, judging from appearances; as to their probable success, amount of stock, habits, application to business, whether they are young and energetic or the reverse, and such other remarks as suggest themselves to you as of service to those from whom they seek credit." (Office of the Mercantile Agency. St. Louis, Mo. July 25, 1872, Circular letter to correspondents). Overall, the Agency sought as much timely information as it could get, and was especially interested in business failure.

In providing clients with credit information, the Mercantile Agency balanced several concerns. Most obviously, the Agency sought to convince audiences of the value of its products: credit information would help businesses make better credit decisions. But credit raters did not want to make explicit promises, for no information was 100%

certain. Credit remained a risky business, and the Dun agency did not want to face unhappy or litigious customers who had used ratings to make bad choices.

The Mercantile Agency was also concerned about how subscribers used its various information products. Dun distinguished between verbal reports, written credit reports and credit ratings. These varied in their brevity and formality, and their relative usage was an ongoing negotiation between Dun and its clients. The Agency consistently stressed the high quality of the information in the ledgers and preferred that subscribers evaluate the information for themselves (this would put the blame for "misinterpretion" on the client rather than the Agency). Indeed, in 1860 they expressed reservations about issuing written reports, suggesting that obtaining reports verbally at the office was best: "We invite the attention of our subscribers to the important fact that, in order to obtain the full benefits our Agency affords, they should *personally* visit us. Our records, extending over so many years, require an *accurate analysis* to arrive at just conclusions. ... To do this effectually, it should be done by the *parties in interest, the principals themselves*, to whom we are at all times pleased to communicate personally, and give all explanations. ... When reports are *written*, they necessarily are given in a *condensed* form; and, where the *history* of a trader *covers nineteen years*, there are so many points to be considered, that *different minds* would form *different impressions*. Clerks might form an opinion that the subscriber would not ..."[17]

The Agency also recognized that as compared to credit reports, the categories that underpinned its credit ratings were crude. "[I]t should be understood that we do not by

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[17] (Office of the Mercantile Agency, circular to subscribers, January 2, 1860). A similar sentiment was later expressed to subscribers about the advantage of reports over ratings: "[W]ith these data [ledger reports] subscribers can at once see the character and standing of the applicant for credit, and draw their own conclusions as to the extent of accommodation it would be judicious to grant." (R.G. Dun & Co. advertisements, *Lakeside Chicago City Directory*, 1872, p. 203; 1873, p. 249; 1874-75, p. 111.)

any means intend it as a substitute for the detailed information in our *Office Records*,

which for minuteness, discrimination and characterization, afford an insight into the

peculiarities of each case which a classification or division into groups can never be made

to reach" (ad, "The Mercantile Agency" *Hartford Courant*, April 8, 1870, p. 2). Yet

because the Mercantile Agency issued ratings on a regular basis and provided written

reports, it was a balancing act to describe both services. In general, however, the

Mercantile Agency preferred to disseminate information through verbal reports read

directly from the office ledgers, followed by written reports and then ratings.

To be sure, the Mercantile Agency acknowledged the merits of their ratings:

"While we are impressed with the difficulties of accurately deciding the relative Credit

Standing of the vast number of names herein contained, under the peculiar circumstances

of the time, we are nevertheless conscious of having arrived at conclusions, in the

majority of cases, that cannot fail to be of the utmost service to all dispensers of credit."

(R.G. Dun & Co., Mercantile Agency Reference Book, January 1868: preface)

Improvements like issuing Reference Books on a quarterly basis in order to stay up to

date were also duly noted. And the Mercantile Agency explicitly touted its ratings, along

with its other information products, as superior to those distributed by their competitors.

Despite the Mercantile Agency's exhortations to do otherwise, their subscribers

seemed to use ratings significantly more than reports. This, in turn, led to increased

warnings and new prescriptions for wiser usage of information. Indeed, the Mercantile

Agency became almost strident in the late 1870s, imploring clients not to rely so heavily

on the rating books, despite having spent, by that time, nearly 15 years developing their

two-statistic rating system: "We notice a constantly growing tendency on the part of our

Subscribers, in deciding upon credits, to rely largely upon the Ratings in The Reference

Book. While, on the one hand, this is a testimony to its general reliability, on the other

hand, this exclusive use of it, for a purpose never contemplated, is as sure to result in

dissatisfaction with it, as it is in loss to the Subscriber. ... If our Subscribers, who are

entitled to obtain this [ledger] information for the asking, neglect to do so, and content

themselves with a glance at a rating, which may have been made months previous, and

are thereby misled, they should not blame the Agency." (Preface to Reference Book, The

Mercantile Agency Reference Book (and Key) Containing Ratings of the Merchants,

Manufacturers and Traders Generally, throughout the Western States. September 1879.

R. G. Dun & Co.) These caveats and disclaimers continued in the prefaces into the early

1880s. Seemingly, the hard lobbying paid off by the mid-1880s when the Mercantile

Agency was able to note with some satisfaction that the dependence on ratings had abated

and that reports were "becoming more influential." [18] Yet the problem appears to have

returned by the late 1890s.[19]

In general, the Agency gave out mixed messages about the value of its

information: it wanted customers to subscribe to the Agency's information, but didn't

want the blame if credit decisions didn't turn out well. The Agency argued for the

superiority of its information over that of its competitors, but stressed the capacity of

ledger information above ratings to help subscribers make sound credit decisions.[20] There

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[18] Preface, Mercantile Agency Reference Book, March 1884.

[19] "Ratings are now so frequently relied upon by subscribers without reference to the written reports." ("Reference Book Notification," *Mercantile Agency Manual*, 1897, 3d edition, pp. 49-50.)

[20] Bradstreet's, on the other hand, advertised almost entirely on the basis of its rating books and generally gave their ratings top billing compared to their written or ledger reports. (See particularly, Circular to prospective subscribers, "J.M. Bradstreet & Son, Improved Mercantile Agency," New Haven, Connecticut, November 1875; see also, "Bradstreet's Commercial Reports," *Chicago Tribune*, July 27, 1864, p. 4).

were several reasons why the Agency favored ledger reports over ratings. First, unlike

verbal and written reports, ratings were never granted protection as "privileged

communications" when suits for libel were brought. And while post-1875 contracts were

written to protect the Agency from lawsuits for negligence when ratings (and reports)

were wrong and subscribers sustained a loss, the Agency continued to fear disgruntled

subscribers. Second, after about 1878 the Agency's pricing structure changed so that

revenues increased with the number of written reports contracted for, so clearly there was

an incentive to sell reports. Third, the Agency's principals were not infrequently

dissatisfied with the quality of the rating done in a significant number of the branch

offices, [21] and they were well aware that changes occurred between printings that did not

make it into the books.

Journalistic commentary played a role in publicizing the benefits and liabilities of

mercantile agencies. From the 1840s through the early 1870s printed opinions tilted

against the agencies. Yet some advocated for the agencies, suggesting that the growth of

credit rating proved its value: "We call attention to the advertisement of Messrs. J.M.

Bradstreet & Co. of their Reference Guide. An accurate work of this description is a

necessity to Banks and private Bankers throughout the west doing an exchange business;

as it is the only means by which they can find out the responsibility and standing in the

different cities of the *drawees* of drafts, which they purchase" (The Bankers' Magazine

and Statistical Register, January 1859, p. 588). Other articles were more specific and

these expositions – a combination of journalism and advertising – provided an idealized

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[21] See, in general, Sheffield, V, pp. 39-40. Also, Circular to Managers, "The Reference Book for July, 1873," New York, Dun & Barlow & Co, March 6, 1873; (Circular to branches, "Rules for "Marking" on Change Book" R.G. Dun & Co., undated, ca. 1875; Circular to managers, R.G. Dun & Co. May 23, 1882 (Reproduced in Sheffield, XIII, p. 11).

version of how ratings might benefit a subscriber. They claimed that Dun's system of

ratings could give a wholesaler the ability "to see at a glance" those being assessed, or

that the system was "superior" in its "simplicity." [22] This portrayed credit-granting using

the *Reference Book* as relatively easy, straightforward and accessible to any subscriber.

The quality of "definiteness" was another useful feature that was attributed to the

ratings.[23] At the same time, because of Dun's two-dimensional rating scheme, the ratings

were also described as being nuanced because they allowed "peculiar flexibility" in how

they portrayed merchants, and "conveyed" "shades of meaning" which was "very

important to those who dispense credits."[24] These kinds of articles would have helped the

Mercantile Agency, and perhaps other agencies with similar rating schemes, to increase

subscribership.[25] Yet, ironically, such articles countered the Mercantile Agency's

warnings that ratings should be used with caution. Newspapers also published "business

autopsy" articles that sometimes suggested that a business's collapse had been

foreshadowed by low ratings previously given by the mercantile agencies,[26] or

alternatively that the collapse came as a total shock because the firm had been so highly

rated.[27]

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[22] "From Bankers' Magazine, excerpted in R.G. Dun advertising circular "Opinions of the Press" ca. June or July 1866. The reviews of the *New York Daily Tribune* and the *Journal of Commerce* also mention "glance."

[23] "From Bankers' Magazine," excerpted in R.G. Dun advertising circular "Opinions of the Press" ca. June or July 1866.

[24] "From the New York Daily Tribune" and "From the Bankers' Magazine," excerpted from the R.G. Dun advertising circular "Opinions of the Press" ca. June or July 1866.

[25] McKillop-Sprague did not switch over to a two-statistic system until 1870, Bradstreet's not until 1874.

[26] For example, an article analyzed the failed paper dealers Gordon & Gilbert: "The liabilities amount to about $30,000, with nominal assets of an equal amount. Bad debts, shrinkage in values, and poor collections are ascribed as the causes of their suspension. The firm have been in business 15 years, but about a year ago their credit rating was cut off at Bradstreet's. Their largest creditor is Smith, Dix & Co., of Baltimore, to whom they owe about $20,000." ("Local Business Troubles" *New York Times*. August 1, 1878, p. 2).

[27] For example, an article about the assignment of Culver, Page, Hoyne & Co. explained: "At Bradstreet's agency it was learned that the firm had been doing business on a capital of $200,000, and that their standing

Irrespective of the business failure autopsies, by the mid-1880s attitudes expressed in the public media tended to be much more favorable to credit agencies, although criticism continued. In Chicago: "The object of the mercantile agency … was not only to enable its patrons to avoid hazardous and unsafe risks but to strengthen their confidence where confidence was deserved; or, in other words, to 'promote' as well as to 'protect' trade. At the outset the new idea met with considerable opposition, but its practical usefulness soon secured the confidence and patronage of merchants, manufacturers, and bankers." (Chicago Tribune, March 15, 1896, p.6). And in New York City: "Rating agencies are employed to keep a record of the transactions of tradesmen, their liabilities and resources. It gets after a while to be a matter of calculation as to the amount for which a purchaser shall be trusted in view of all his circumstances. ... Since the commercial agencies have attained such magnitude the credits [of merchants] are based largely on their information. Owing to the extent of the country the individual merchant cannot keep track of the responsibility of the traders in the different States who may desire to purchase of him. To maintain their own reputation the agencies must strive for accuracy and trustworthiness, and, therefore, their reports have come into widespread use." (NY Times, April 22, 1883, p.6). Such comments were common. One noted expert, who criticized the agencies, nonetheless avowed their importance: "It may also be added that our present widely extended credit system is largely due to the labors of the agencies, and it is no longer a disputed question that they supply a want, and are indispensable to

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had always been rated "very good." About a year ago a flurry in paper had occurred, and it was supposed that Culver, Page, Hoyne & Co. were badly crippled by it. Their pay was characterized as "slow" at that time, but their creditors made no complaint, and they were rated by Bradstreet as before. The capital of the firm had apparently been seriously impaired at that time and since. It looked like a bad case, though an assignment had been made. It was totally unexpected by the Bradstreet agency." ("Legal Steps" *Chicago Daily Tribune*. October 30, 1883, p. 3.)

the business public" (Earling 1890: 304). Despite the Mercantile Agency's own stated misgivings, these comments suggest that there was a wide public perception of credit ratings and reports as straightforwardly useful for the administration of credit. [28]

From all these sources, current and prospective subscribers received quite mixed messages about the usefulness of ratings.[29] Nonetheless, even though the two leading agencies after the late 1870s made different claims about the efficacy of ratings, each placed rating books squarely as an integral part of their service. By the late 1860s, only the smallest of subscribers could obtain a subscription without getting the ratings. And while the agencies competed through claims-making about all of their services, ratings played a more visible role because they were not locked in the office and provided a vivid representation of the scale and scope of an agency's expertise. In other words, despite any misgivings that the mercantile agencies had, ratings were given to many subscribers to use and their ubiquity helped make ratings the face of agency practice.

The Credit Rating Process

As Cohen (1998) shows, what went into credit evaluations was a variable and unsystematic collection of facts, judgments and rumors about a firm, its owner's

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[28] Even the critics subscribed to Agency services, most notably the National Association of Credit Men, formed in the late 1890s. See, for example: "Credit Men and Credit Associations," 1897. *American Lawyer*, 5: 459-460; "Address of William T. Rolph. Before the National Association of Credit Men, Kansas City, Missouri. June 10, 1897"; "Improved Credit Reports," *New York Times*, August 22, 1897, p. 11; "Address to the Mercantile Agencies," 1898. *American Lawyer*, 6: 175-177. There were also legislative efforts in late 19th century aimed at regulating and/or reforming mercantile agencies: Massachusetts, Illinois, Pennsylvania, North Dakota, South Dakota. Only South Dakota enacted a law, which it repealed after only a few years.

[29] To some observers ratings had "become the basis upon which the wholesale dealer relies in determining the extent of credit he will allow his customers" partly because the ratings were "thoroughly and efficiently made." ("From the New York Daily Tribune," excerpted in R.G. Dun advertising circular "Opinions of the Press" ca. June or July 1866).

personality, business dealings, family and history. After the 1850s, what came out was a formalized, systematic and comparable rating of creditworthiness published in a Reference Book. Today's credit ratings are constructed with a high degree of methodological self-consciousness, but matters were obviously different in the 19th-century. Petersen's distinction between "hard" and "soft" information in credit markets captures well how credit raters processed information (Petersen 1999, Petersen and Rajan 1994). "Soft" information is qualitative and "hard" information is quantified. "Hard" and "soft" information differ sharply in how they are acquired, their costs of production, storage and distribution, and provenance (Cowan, David and Foray 1999, Foray 2004). The emergence of credit rating marked a 19th-century revolution in the production of hard information. Rating agencies gathered and stored "soft" credit information, transformed it into "hard" ratings, and then sold the ratings to their customers. Agency subscribers had ratings delivered in book form, and upon request could obtain detailed verbal or written reports. Each format differentially affected the social distance between the user of the information, its producer and its source.

The ratings reflected not only the state of the world (i.e., whether rated firms really were becoming insolvent, or not) but also the internal workings of the Mercantile Agency. Unfortunately, there is no surviving protocol, operating manual, or formal coding procedure stipulating how in this period employees of R.G. Dun combined various pieces of qualitative, textual information contained in their ledgers (obtained from correspondents and local offices around the country) and turned it into a categorical rating. But by comparing ledger information about a firm with the corresponding rating, one can make some inferences about the process.

External constraints were diffuse. Credit-reporting was unregulated at the federal level until the Fair Credit Reporting Act of 1970 (although there were attempts to regulate mercantile agencies at the state level, starting in New York in 1861).[30] While favorable court rulings and restrictive contracts helped to lessen legal liability during the latter part of the 19th century, credit reporting agencies remained concerned about suits for negligence, slander and libel (Sandage 2005: 178-184). The doctrine of privileged communication, used to shield the agencies from libel and slander suits for their reports, was never extended to cover the rating books (Thornton 1896: 37-40).

The format of Dun Reference Books changed over time, but during the mid-1870s and 1880s rating books listed firms alphabetically (by the proprietor's name) by location (city and state), stated the line of business (e.g., dry goods vs. millinery vs. carpets), and then rated them along two dimensions: "pecuniary strength" and "general credit." The former was an estimate of the net worth of the firm (total assets minus total liabilities), and firms were classified into rank-ordered categories (e.g., pecuniary strength greater than $1 million, less than $500, between $10,000 and $20,000, etc.). The assessment of general credit put a firm into another set of ordered categories labeled "high," "good," "fair," or "limited." *A priori*, these seem to be two quite distinct dimensions. Net worth was a characteristic with inherent magnitude, and so should have been measurable using a quantitative rating scale.[31] General credit, by contrast, raised problematic issues of how

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[30] "News of the Day," New York Times, March 4, 1861, p. 4.

[31] This is not to say that the process was simple, because estimates of net worth were calculated in the absence of well-defined accounting rules, disclosure requirements, or even professional accountants. For example, rules about how to account for "homestead exemptions" in the determination of pecuniary strength were not standardized within the Mercantile Agency until 1891. (See Circular to managers (4-91), "Deduction of Exemptions," R.G. Dun & Co., New York, February 25, 1891.) And there could be differences of opinion on net worth between clerks of an agency. (See, for example, testimony of Bradstreet's clerk George D. Barrett at the Mellier v. Bradstreet trial, "The Suit Against the Bradstreet

to measure trustworthiness, which did not possess a well-defined or agreed-upon metric.

Sometimes a firm was listed but given no rating for pecuniary strength, general credit, or both. In such cases, the "Explanatory Key to Ratings" in the Reference Books stated: "The absence of a Rating indicates those whose business and investments render it difficult to rate satisfactorily to ourselves. We therefore prefer, in justice to these, to give the detailed reports on record at our Offices." In other words, the absence of a rating for a listed firm meant that Dun had information about the firm but could not or would not render it into a systematic rating. Readers were explicitly encouraged in these cases to contact the Dun offices for further information. Since the actual rating remained unknown, we term this the "*x-rating*."[32]

The published ratings appeared systematic, unambiguous and comparable, but behind them lay a welter of *ad hoc* and often inconsistent information, which was selectively available to clients only upon request. The compression, categorization and simplification of information that occurred in the translation from ledger to reference book exemplifies the process of uncertainty absorption identified by March and Simon (1958). The ledgers contain complex, detailed information derived from multiple sources that was often inconsistent and ambiguous. The ratings in the reference books were, by contrast, simple, specific and seemingly unequivocal. As noted, the Mercantile Agency

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Agency," *Missouri Democrat*, July 23, 1871, p. 4.)

[32] Dun called these "blanks." The meaning of a listing-with-no-rating was itself legally contested. For example, in Carsley v. Bradstreet one businessman sued the Bradstreet Mercantile Agency for being listed but not given a rating on the grounds that this was an erroneous signal that he was in trouble: " Call at office" was understood to mean "... that the firm was in difficulties, and, in answer to inquiries made at the office of the Mercantile Agency, it was stated the firm was in financial difficulties and asking for an extension of time from their creditors." (Chicago Tribune, October 21 1885, p.7). The plaintiffs won the suit (New York Times, November 21, 1885, p.1) and prevailed following Bradstreet's appeal (New York Times, May 27, 1887, p.1)

worried, however, that subscribers relied too heavily on the simplifications presented in the Reference Books.

Several features distinguished the process of uncertainty absorption in which soft information was "firmed up" (see Carruthers and Cohen 2000). First, the ambiguity and inconsistency of the ledger information was suppressed. The ledger records often contained contradictory information – some facts suggested higher creditworthiness while others implied lower. Such inconsistencies disappeared as the user of the reference book was given a single unequivocal rating for each firm (the equivalent of a point estimate with no standard error). Second, the volume and dimensionality of information was reduced enormously: complex qualities and multiple shadings were rendered into the simple categorical logic of the rating system. The ratings served as "bottom lines" that summarized a vast amount of qualitative information. Third, the social-relational quality of creditworthiness (its social "embeddedness") was erased in the published ratings. For example, many ledger records acknowledged that the creditworthiness of a given firm depended on who its creditors were. In particular, creditworthiness varied with social distance: creditors who were "friends" of a debtor were described as being more likely to be repaid than creditors who were "strangers."[33] In other words, greater social distance implied lower creditworthiness. Yet this important social contingency disappeared as rated creditworthiness was presented as a characteristic of a firm, not as a relationship between firms. Fourth, the provenance of information was removed. In general,

[33] For example, the ledgers observe about Emanuel Klein that: "credit should be mainly confined to parties who know him closely, ... in his present condition should be sold cautiously by strangers," (Illinois Vol.34, pp.200-201, R.G. Dun & Co. Collection, Baker Library, Harvard Business School). This distinction reflected the fact that insolvent debtors frequently favored some creditors over others, and tried to repay their friends and family ahead of strangers (Balleisen 2001: 90-92, 127).

information from credible sources is more useful than information from unreliable sources. In the ledgers, Dun reporters and correspondents often distinguished among the different sources of information they used to learn about creditworthiness, but this provenance disappeared from the reference book ratings. For instance, information was sometimes obtained directly from the rated firm (Dun reporters might solicit a financial statement), from key informants (a local banker, creditor or attorney), from general perceptions ("the trade" think this or that about a firm, or more ambiguously "it is said"), and sometimes from direct observation (go to the store and look at the shelves). Yet the published ratings give no indication whether some sources were weighed more heavily than others. Additionally, the ratings imparted no sense of trajectory: there was no way of telling whether the rating was assigned as a result of growth, or retraction, or if there was simply no change at all.

Finally, credit rating induced a process of reactivity that the raters were well-aware of.[34] The objects being rated (firms) knew they were being rated, and thought that the ratings would affect their chances of survival. A high rating would help ensure a continued supply of credit, whereas a poor rating could make credit expensive or even unobtainable. Ratings seemed like self-fulfilling prophesies: the rating itself could create the economic conditions that made the rating "true." Indeed, rated firms sometimes sued credit raters, arguing that falsely low ratings hurt them. For example, a Mr. Mellier sued Bradstreet's Commercial Agency, stating that: "... the report published in the July number of the Agency's reports had injured his standing and damaged his credit..." (Chicago

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[34] On reactivity, see Espeland and Sauder 2008.

<u>Tribune</u> July 23, 1871, p.1).[35] With so much at stake, many firms tried to manipulate the rating process so as to get a better rating. But the credit raters recognized this, and tried to compensate for it.[36] For example, raters would take into account whether a firm was reluctant to provide information about itself (to "give a statement"), and ledgers sometimes noted if correspondents thought they were being deliberately misled.

Overall, if "soft" information was unsystematic, complex, qualitative, ambiguous, and variably reliable, the "hard" ratings manufactured out of the soft information seemed systematic, simple, precise, comparable, and scaled to well-defined metrics. Not only was credit information transformed as hard ratings were created out of soft ledger information, but the format of hard information itself evolved over time. The category system used by Dun for its ratings, for example, developed between the 1850s and the 1880s: the measurement of pecuniary strength became more refined as the number of categories grew while the measurement of general credit remained relatively stable over this period. Seemingly, Dun improved how it measured pecuniary strength.

The Evolution of Ratings

We have ratings of Chicago dry goods firms from three agencies (Bradstreet's,

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[35] From at least the late 1840s, merchants who disagreed with the contents of credit reports had filed lawsuits against the mercantile agencies. Mellier v. Bradstreet appears to be the first suit that specifically involved a regular rating published in a rating book.

[36] For example, Dun obtained a financial statement from the firm of Morper and Dernberg in July of 1880 and observed in the ledgers that: "We have submitted the foregoing [statement] to excellent authorities who say it is impossible that they could have made as much as this statement shows ... their apparent anxiety to secure a high rating is cause for a degree of caution" (Illinois Vol.43, p.334, R.G. Dun & Co. Collection, Baker Library, Harvard University).

Dun, and McKillop-Sprague) at various points from January 1875 to March 1884. This allows us to compare different agency's ratings of the same companies, and one agency's (Dun) ratings of the same firms over time. The category system that underpinned knowledge about creditworthiness itself evolved as Dun refined or adjusted its system of categories, supplying a new "key" for readers to use when interpreting the entries in the reference books. Given vigorous competition among the agencies, it seems plausible that subsequent category systems were "more useful" than their predecessors, and provided better information to clients. Let us consider the measurement of pecuniary strength.

Category systems are based on distinctions, and one simple way to compare rating systems is to consider how many distinctions they make. Figure 2 gives a simple count of numbers of distinct categories for pecuniary strength and shows a clear pattern. From 1864 until 1883, the Mercantile Agency (R.G. Dun) developed an increasingly refined measure of pecuniary strength: the number of categories increased steadily, going from 8 to 15. Yet even Dun's most elaborate category system, in 1883, still had fewer categories than either Bradstreet's did (in 1874) or McKillop-Sprague (in 1872).

[FIGURE 2 ABOUT HERE]

The measurement of pecuniary strength was highly non-linear. That is, more categorical distinctions were made for low values of pecuniary strength than among high values. The distance spanned by a given category increased as the overall dollar values increased. So far as credit rating was concerned, the categorical difference between $1,000 and $11,000 was much more significant than the difference between $101,000

and $111,000, although the difference in dollars was identical. Figure 3 contrasts the

1864 Dun system with the Dun system used in 1883, charting the cumulative number of

categories over the full range of pecuniary strength. Figure 4 presents the two original

"keys". The non-linearities are readily apparent. Furthermore, categorical elaboration

concentrated on the lowest values of pecuniary strength. In 1864, Dun had only one

category for firms worth less than $5,000, whereas by 1883 there were four. The focus on

smaller, less-known firms makes sense given that credit ratings were more useful when

applied to those firms where the margin for error was smallest (e.g., small, poorly-

capitalized firms), but which represented a proportionately large number of potential

trading partners. Credible information about these firms made it easier for them to obtain

credit.

[FIGURE 3 ABOUT HERE]

[FIGURE 4 ABOUT HERE]

Unlike pecuniary strength, there was little difference between raters in how they

classified general credit. Furthermore, very little change occurred during this period in

how Dun categorized general credit. It seems that innovation in economic knowledge

occurred for one of the two dimensions of credit worthiness. Not coincidently, this was

the dimension most amenable to quantitative measurement. Indeed, the very label

"pecuniary strength" refers to money, something which came in uniform, divisible units.

Ratings and Reliability

As a type of information, the published ratings had many desirable qualities. They were simple, systematic, and comparable. They appeared "objective" and quantitative (Earling 1904: 1). By contrast, the soft information contained in the ledgers was complex, unsystematic, incomparable, qualitative and "subjective." The real irony, of course, is that the hard rating information was manufactured out of the soft ledger information. But given that the rating categories changed over time, and given that different agencies created their own ratings, how much agreement was there among the rating agencies? If their hard ratings were truly objective, or if competition pushed raters in that direction, then we would expect substantial agreement. One obvious but nevertheless important type of convergence occurred over the dimensionality of credit: after 1875 all the raters treated it as basically a two-dimensional phenomenon.[37] By the 1880s, no-one proposed that credit was a one, or a three or four dimensional phenomenon. Despite that overall agreement, the various agencies appeared reluctant to allow direct comparisons between their ratings: only a couple of the rating categories were the same among the keys used by Dun, McKillop-Sprague and Bradstreet's.

Our sample contains ratings by different rating agencies of the same firms at the same time: Bradstreet's and Dun in January of 1875, for example, and then again in July 1879. This exact overlap reveals the extent of convergence in the measurement of creditworthiness. In January 1875, Bradstreet's and Dun both rated 75 firms in our data set, and in July 1879 both rated the same 123 firms. The correlations between the ratings were very high. The zero-order correlation coefficient between the pecuniary strength

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[37] By way of comparison, in 1860 all the agencies rated with a single measure. Dun switched to two dimensions in 1864, McKillop in 1870, and Bradstreet in mid-1874.

ratings done in January of 1875 was 0.9233, while that for pecuniary strength in July

1879 was 0.9447. The correlations were somewhat weaker for general credit, but still

very significant. The January 1875 Dun and Bradstreet's ratings for general credit had a

correlation of 0.7901, and the July 1879 correlation was 0.7219.[38]

The entire matrix of pairwise correlations among all the ratings in the dataset

shows that the high level of agreement is not simply a function of rating the same firms at

the same point in time. Table 1a presents the zero-order correlations of all the different

ratings of pecuniary strength given by rating agencies.[39] All of the correlations are

positive and statistically significant, no matter how long the time between them.[40] For

example, consider that the January 1875 Dun rating of pecuniary strength is correlated

0.8599 with the Dun ratings of March 1884. In fact, the obvious message of these

correlations is the very high degree of consensus between and within credit raters over

the pecuniary strength of rated firms.[41]

[TABLES 1A AND 1B ABOUT HERE]

Table 1b presents correlations among the ratings of general credit. Again, all of

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[38] Correlations among Dun and Bradstreet's "x-ratings" are positive, but lower still.

[39] "Dun175P" refers to the Dun rating of pecuniary strength done in January of 1875. "Brad779P" refers to the Bradstreet's rating of pecuniary strength from July 1879.

[40] For a benchmark, consider that correlations of ratings of senior debt by Moody's and Standard & Poor's are around 0.97. Correlations of junk-bond ratings are around 0.83, while correlations of ratings of international banks are around 0.77 (Cantor and Packer 1995).

[41] A factor analysis of the correlation matrix reveals one single underlying factor.

the correlations are positive and statistically significant. And yet there is relatively less

agreement over general credit than pecuniary strength. Credit raters could more easily

agree on their assessments of pecuniary strength than on general credit. The latter

remained a somewhat more opaque quality.[42]

Unless they directly plagiarized one another (which occasionally happened),

credit raters did not provide identical ratings. But high correlations among the ratings

suggest that credit-worthiness was a relatively stable characteristic of firms about which

there was strong consensus,[43] although agreement was stronger for pecuniary strength

than for general credit. Whether it was because competition forced the agencies to

converge on similar rating practices, or convergence resulted from some type of

institutional isomorphism, or because large divergences were identified and sanctioned

by subscribers, there was very substantial consistency over the measurement of pecuniary

strength, and strong agreement over general credit.

Although agencies agreed with each other in their ratings, we still don't know

how they calculated their ratings. There are no surviving procedures or instructions for

how to produce a rating, and there is no evidence that such procedures even existed over

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[42] The difference in correlations is not an artifact of the difference in number of categories. Although ratings of general credit had fewer categories than ratings of pecuniary strength, there is no necessary connection between correlations and number of categories. Depending on the underlying distribution, correlations can be either strengthened or weakened depending on the number of categories. Factor analyzing the correlation matrix for general credit also reveals one single underlying factor.

[43] Another way to assess agreement among ratings is to determine whether new ratings added additional information to prior ratings. Here, we regress ratings against each other. To give a simple example, regressing the Dun pecuniary strength rating of July 1875 against the Dun and Bradstreet ratings of January 1875 produced an r-square of 0.9836. Regressing the Dun pecuniary strength rating of September 1879 against earlier ratings produced an r-square of 0.9929. Such regression results simply underscore the high convergence among credit raters.

most of the 19th-century. However, since we possess the "soft" information from the ledgers, we can use it to estimate the rating and so construct an implicit rating algorithm. Tables 2 and 3 list the variables used in our quantitative analyses. For the first analysis, we use ledger information about a firm to estimate the firm's rating.

[TABLES 2 AND 3 ABOUT HERE]

The dependent variables in Table 4 are the overall averages for ratings of pecuniary strength and general credit.[44] We used simple OLS regression (with clustering for the non-independence of some of the firms) and tried to see which independent variables were significant. To keep the presentation simple, non-significant variables are excluded from the table.

[TABLE 4 ABOUT HERE]

Social characteristics of the proprietor figured into the equation. Gender had an effect in that female proprietors received significantly weaker ratings for both pecuniary strength and general credit (note that pecuniary strength [PS] and general credit [GC] are scaled differently: a higher PS score means greater strength while a higher GC rating means less credit). Of course, it may be that women simply had fewer assets (or more liabilities) and weaker credit. But it could also be that mercantile agencies discriminated against women and gave them weaker ratings. Scholars have noted that Jewish-owned

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[44] Given how highly correlated the individual ratings were with each other, using the average allowed us to reduce problems with missing data and measurement error.

businesses were sometimes written about harshly in Dun ledgers (Gerber 1982, Mostov 1983) but we find no evidence that Jewish-owned firms received systematically different ratings than did non-Jewish firms.[45]

Whether a firm was female-owned would have been apparent from the name listed in the Reference Book. But the other variables in table 4 were only available to someone with access to the ledger information. A firm that owned real estate clearly received better ratings, which suggests that the agencies believed that tangible wealth increased creditworthiness. "*Earlyslow*" measures whether the Agency noted in its ledger that a rated firm was "slow" in making its payments, and this variable hurt the rating of GC. "*Earlynogencr*" means that the Agency concluded in its ledger that a firm was not good for general credit, and such a conclusion also had predictable effects on both PS and GC. Finally, "*earlystate*" measures whether or not a firm's proprietors cooperated with the Agency's staff and provided them with a financial statement. The effect of "*earlystate*" is clear: firms which issued such statements received better ratings.

Although not conclusive, these regression results suggest that the Agency indeed used the information it gathered to construct ratings. Some of that information would have been public (e.g., the gender of the firm's owner, and perhaps whether they owned real estate), but much of it lay in the confidential ledgers, obtained via the Agency's correspondents and reporters. Ratings were determined, in part, by the possession of tangible wealth, two internal indicators of financial trouble (slowness in payment and lack of general credit), and a measure of a firm's willingness to be forthcoming about its finances to the Agency. In addition, the proprietor's gender had a significant effect,

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[45] But Dun's reporters clearly thought that their subscribers would want to know who was Jewish, for the identification of merchants in the reports as a "Jew," "Hebrew," or "Israelite" far exceeds any other religious affiliation.

although we don't know whether women truly had lower pecuniary strength and worse

general credit, or whether the Agency discriminated against them. Much remains

unknown about how ratings were created.

Predicting Failure

Recall that the Mercantile Agency (and Bradstreet's) claimed that the information

it provided could be used to "premonish" failure, and repeatedly asserted that reports and

ratings were useful for the management of credit (see also Sandage 2005: 111). Given the

economic consequences of failure, the desire for predictive signals could explain why so

many merchants and firms sought credit information from Dun.[46] Since the Dun ledgers

recorded whether rated firms failed, it is possible to test statistically whether the ratings

predicted failure. Such predictive value would offer an easy explanation for why the

credit rating industry grew so rapidly: credit rating spread because it allowed creditors to

avoid bad debts by "premonishing" failure. The question of whether ratings could predict

also foreshadows a key criticism made against contemporary rating agencies (namely,

that their ratings of CDOs were not predictive).

One can also propose a social constructionist argument consistent with some of

the claims of those who sued credit raters. Suppose credit ratings did not measure

creditworthiness so much as constitute it (in the same way, following Power [1994,

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[46] Although the Mercantile Agency was usually cautious in its claims and only
alluded to the usefulness of credit ratings for avoiding bad debts, by soliciting
information about failure from correspondents, by publishing statistics on business failure
in its own annual Circular, by noting that failure was a ubiquitous problem, and by
supplying such figures to both business and general newspapers, the Agency continually
underscored its association with information about failure.

1997], that other audit-based technologies of governmentality constitute modern subjects). Or suppose that rating agencies and their clients jointly "performed" creditworthiness, by enacting an implicit theory embodied in ratings (following MacKenzie and Millo 2003). If so, a rating would induce self-fulfilling behavior in creditors, with low ratings creating low credit-worthiness and high ratings creating high credit-worthiness (such, in fact, was the complaint of firms who were given low ratings). Because firms depended on credit, independent of their true financial status a lower rating would encourage creditors to deny credit, or to extend it on more onerous terms, and this would make firms more likely to fail. Even under this alternative formulation, credit ratings would still statistically predict failure.

There are three further specifications to the general hypothesis that credit ratings predicted failure. First, we expect that ratings of pecuniary strength will perform better than ratings of general credit not only because those measures were refined over time (presumably for the better) but also because what they tried to measure (financial net worth) was inherently more quantifiable than was general credit. A thing that is easier to do, is also easier to do well. Of course, the two measures together should perform better than either one alone. Second, we hypothesize that credit raters performed a "rational" process of information reduction, i.e., that the simplifed information included in the ratings was a "signal" whereas the complex ambiguous information which remained behind in the ledgers was "noise." This means that in winnowing down and "hardening" all the "soft" information contained in the ledgers, Dun concentrated the signal and filtered out the noise. Thus, the published ratings should predict failure better than information which remained in the ledgers (or in other words, controlling for the ratings,

ledger information should not improve predictive ability). Third, it is possible that what

mattered most was not the rating *per se*, but change in the rating. The Agency tried to

keep its ratings from bouncing around too much,[47] so a sudden drop in the credit rating

would signal trouble more powerfully than just a low rating.[48]

Variables:

In this analysis, failure was coded as a binary outcome (named *latefail*), equal to 1

if the firm failed during the 1877-1884 period, and equal to 0 otherwise (see table 2 for a

listing of all the variables).[49] Despite designing the sample to maximize the number of

failures, failure thus defined proved to be relatively rare and occurred only 16 times to the

firms in our sample.[50]

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[47] Dun's raters were instructed to avoid "frequent and absurd fluctuations in rating." (Circular to managers, "Rules for "Marking" on Change Book," ca. November 1875.)

[48] As a precaution about the predictive value of change or stability, consider the example of J.F. Russell of Chicago (Illinois, Vol.38, p.61, R.G. Dun & Co. Collection). This company failed spectacularly in November of 1880, paying creditors only 20 cents on the dollar. In September of 1880, just before, Dun gave this firm a K 3 ½ rating, putting its pecuniary strength between $1,000 and $2,000, and its general credit rated as "fair." Dun had issued the exact same rating to this company in 1879, 1878, 1877, and 1876. In this case, there was no rating change to warn of disaster.

[49] Chicago firms that either went bankrupt, were sued for nonpayment, failed, or had to arrange an extension, assignment or compromise on their debts were considered to have failed. Firms that simply closed down, where one partner bought out the other, or where the owner retired or moved away, were not coded as failures.

[50] Statistical approaches that use the panel structure of the data, such as a fixed effects pooled logistic regression, are problematic because of relative lack of variation on the dependent variable. Were we to treat each firm/time-period separately, the 16 failures would be distributed over 4199 observations instead of 247, making failure even rarer. In

The independent variables measure a number of characteristics of firms in the period from 1875 to 1877, and include items from both the published reference books and the unpublished ledgers. The published information included the average (across all raters) rated pecuniary strength of a particular firm (*earlyps*), and the firm's average general credit (*earlygc*).[51] We also calculated change scores over the 1875-1877 period to measure any increase or decrease in pecuniary strength (*psdiff2*) or general credit (*gcdiff2*). Although we derived these measures from published information, none of the credit rating agencies actually published change scores in the reference books. The final items derived from published information were the so-called "x-ratings," which measured whether a firm was given an "x-rating" by a credit rater before 1877 for either pecuniary strength (*earlyxp*) or general credit (*earlygc*).[52] X-ratings signaled the limits of the rating system. To account for the possibility of gender or ethnic differences in the propensity to fail, two dummy variables measured whether a firm's proprietor/owner was *Jewish* or *Female*.[53]

We also constructed a number of measures using information contained in the Agency ledgers, but not separately published in the reference books. To take account of

such an approach, models that never predicted failure would fit the data very well, but despite their statistical virtue, they would not shed light on the substantive problem at hand.

[51] Averaging across ratings helps reduce the problems of measurement error and missing values, and is unproblematic given how highly correlated all the ratings are.

[52] Recall that an x-rating meant a blank for the rating of a listed firm. It occurred when a rater had information on the creditworthiness of a firm that they would not or could not express in terms of the rating system.

[53] The first takes a value of 1 if the proprietor is identified as Jewish (e.g., words like "jew", "hebrew," "israelite" are used in the ledgers). The second takes a value of 1 if a proprietor of a firm, or at least one of the partners, is a woman, and gets 0 otherwise.

the reactivity of the credit measurement process, we focused on the information provided by rated firms. Dun personnel often sought financial information directly from firms themselves, and in the ledgers such information was termed a "statement." When Dun personnel solicited such a statement, however, they might or might not receive one. It was generally believed that refusal to give a statement indicated that the firm had something to hide. However, some firms were "excused" from giving statements on the grounds that they were very large, or that their owners were antipathetic towards agencies. Given their significance (Dun was careful to note if a statement were made or not, their content, and whether Dun found them credible [Prendergast and Steiner 1931: 263,281]), we measured the number of times a firm provided a statement to Dun in 1877 or before (*earlystate*), and the number of times a firm explicitly refused to provide such a statement (*earlynostate*). These two variables indicate how cooperative or forthcoming a firm was in providing information to Dun.

As noted, in the transformation of ledger information into a rating, information was selectively compressed and summarized. Information about the social contingency of credit was excised. Sometimes the Dun ledgers distinguished between "friends" or "acquaintances" and "strangers," or between "insiders" and "outsiders," in relation to credit risks vis-a-vis a firm. For example, Dun might note that a particular firm was creditworthy for "friends," but not for "strangers." This distinction underscored the specificity of creditworthiness and its embeddedness in social relations. The variable *earlystrange* measures the number of times Dun made this distinction for a firm in its ledgers in 1877 or before.

Finally, we included a ledger-based variable that measured whether the firm

seemed to be getting into financial trouble. A firm that was slow in making payments might be headed for failure, although some firms were just chronically tardy. *Earlyslow* counts the number of times in 1877 or before that Dun noted in its ledger that a particular firm was slow in paying its bills.

Analysis:

Given the relative rarity of failure in our data set, it was not obvious that logistic, probit or linear probability models would give similar results (since these functions differ most in the extreme tails of the distribution). Furthermore, there was no theoretical reason to prefer one model over the other, so we fit all three. In addition, the rare-events logistic regression method developed by King (King and Zheng 2001a, 2001b) was also applied. But since the results from all these methods were very similar, we present only the simple logistic regression results. Because of non-independence among some of the firms, we used Huber-White robust estimates of the standard errors in all models.[54]

Table 5 gives the logistic regression results. Models 1 and 2 show that neither ethnicity nor gender factor into the likelihood of failure, nor do they become significant in any other model specifications, and so we dispense with them. Model 3 presents a direct test of the predictive power of the ratings, but neither pecuniary strength nor general credit are significant. Furthermore, the model's pseudo-R^2 is tiny. Even when considering extreme values for pecuniary strength and general credit (i.e., firms that were

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[54] Some firms had familial connections to each other, although the rating agencies considered them to be distinct entities. For instance, a firm at one point might be run by a father, and at a later point by the sons, a wife or a widow. This raises the possibility of non-independence of the observations, and hence necessitates robust estimators.

either very high or very low on the two ratings), we found no effect (results not shown).

We then proceeded to consider whether, controlling for the ratings, any of the ledger-based measures were significant. Model 4 shows that *earlyslow* is significant, even controlling for both ratings, and even though *earlyslow* is a significant determinant of the general credit rating (see table 4 results). A firm identified by Dun in its ledgers as being slow in making its payments was more likely to fail, controlling for how it was rated by Dun in the reference books. Model 5 enters the two change scores, and it seems that an increase in rated pecuniary strength decreases the chances of failure, just as a decline in the rating increases the chances. Changes in general credit seem to have no significant effect.

Models 6 through 9 present various combinations of variables, and across them all it is clear that change in pecuniary strength has a robust effect on failure, that the ratings themselves have no effect, and that various of the ledger-based measures have an effect on the probability of failure. In particular, *earlynostate* has an effect suggesting that firms which explicitly refused to give statements to Dun staff were much more likely to fail (seemingly, failure to provide information was itself informative about failure). However, *earlystate* has no effect, meaning that willingness to make a statement and refusal to do so, were not symmetric opposites. *Earlyslow* is no longer statistically significant in models 7 and 8, although the direction of its effect remains the same as in model 4. Finally, in model 7 *earlyxp* has a weakly significant effect: controlling for the level and change in the pecuniary strength rating, firms issued the "x-rating" for pecuniary strength were less likely to fail. None of the other variables had a significant effect and so we do not present them. Overall, the best fitting model has a pseudo-R^2 of 0.178, which means

most of the variation in failure is still unexplained by anything the rating agencies knew, published or unpublished. Even for clients using the services of the rating agencies, the extension of credit remained an uncertain business.

Discussion

In the 19th-century, credit raters hardened "soft" information about creditworthiness and turned it into a commodity they were able to market with great success. The chief selling point was that agency information could help merchants make better decisions about credit when they were operating outside the familiar terrain of personal social networks and ongoing business relations. Credit ratings were convenient, and would supposedly allow lenders and suppliers to distinguish between good risks and bad. From this perspective, the dramatic spread of credit rating information was *prima facie* testament to its usefulness in the marketplace, and it can be seen as a successful exercise in quantification. Yet, ratings had an ordinal precision that was often unsupported by the information actually used to generate them. Specious specificity helped raters to sell their product (after all, who wants to pay for vague advice), and firms using the ratings may have thought they could foresee problems, but amidst the conflicting claims made by various parties, no-one really knew what might occur. Agency ratings made credit look like a game of risk when in fact it still remained largely a game of uncertainty (to use Knight's [1971] distinction).

Over time, the credit rating industry made great progress. More firms were being monitored and rated with every passing year and coverage increased to the point where

information was available on more than a million firms. R.G. Dun and its competitors expanded by opening new branch offices and utilizing growing numbers of correspondents and reporters. And the product, a form of economic knowledge, also seemed to get more precise and accurate. Between 1864 and 1883, raters elaborated their category systems and provided ever-more refined measurements of pecuniary strength. Indeed, by the early 20th century a report from Bradstreet's or R.G. Dun was practically the first thing a bank loan officer would turn to when assessing a client's creditworthiness (Prudden 1922: 44-45, Zimmerman 1904: 48). And the industry's success was such that John Moody imitated it when he began to rate railroad bonds in 1909 (Coffee 2006: 293).

The credit rating industry came to an implicit agreement about the nature of creditworthiness. By the mid-1870s, all the major rating agencies concurred that creditworthiness was fundamentally two-dimensional. However eager they were to simplify matters for their clients, one dimension was too simple and so they opted for two: pecuniary strength and general credit. How they categorized these two dimensions varied, and their methods of data collection probably differed, but when it came to measuring the specific pecuniary strength or general credit of a particular firm at a particular point in time, there was remarkable agreement. As the correlation matrices show, ratings were stable over time and the agencies strongly agreed among themselves who scored high and who low.

It isn't clear how ratings were created out of the raw ledger information, or if indeed there was a systematic method, but the table 4 results show a connection between informational inputs and rating output. If firms owned real estate, freely provided information to the agency and weren't slow in making payments to creditors, were run by

men, and weren't noted in the ledger as not being good for general credit, then they were given a better rating. These results are consistent across the two dimensions of creditworthiness. We can't tell whether the gender effect involves discrimination or not, but the effect of property ownership, timely payments and being good for general credit all make economic sense. The effect of making statements to the Agency is particularly significant because it gets at the heart of measurement as a social process. Credit raters weren't measuring passive things, for the objects of their scrutiny interacted with Agency staff in ways that could raise their ratings. Gathering credit information was clearly a reactive process (Espeland and Sauder 2007).

Claims about the usefulness of ratings and the strong consensus over ratings suggested that ratings would foretell failure. And yet, the simple prediction hypothesis is not supported. Model 3 in table 5 shows that the two ratings together do not predict failure. Using just the ratings, a client wouldn't know which of their customers was most likely to cost them money. And the results also undermine simple social constructionist arguments: being labeled with a poor rating didn't make a firm more likely to fail just as being given a good rating wasn't a guarantee of success. But if the ratings didn't predict failure, *change* in pecuniary strength did: firms with declining ratings were more likely to fail, while those whose rating increased were less likely to fail. Change in general credit seemed to make no difference, which is consistent with our expectation that pecuniary strength ratings would perform better. Ironically, however, the rating agencies did not indicate ratings changes in the books, nor did they make it easy for their clients to do so (older versions of reference books had to be returned when a client was issued the newest edition). The information was there for the taking, but agencies seemed generally

reluctant to inform their clients as fully as they could. For instance, from the introduction of ratings until the late 1880s, the Mercantile Agency did not routinely include ratings with their written reports, and when they did it was at the discretion of local branch managers.[55] Dun headquarters only began to suggest in the early 1890s that branch offices include ratings "more constantly" (and they focused mostly on *changes* in ratings).[56] Not until 1896 did the addition of ratings to all reports become a "universal rule" within the Agency. [57] Subscribers would have been smart to follow the advice of mercantile agencies and look beyond summary ratings to reports for more information, but they would have had to know what to look for, and on that score the agencies weren't offering any advice.

Rating firms performed Procrustean feats of uncertainty absorption in reducing reams of complex, ambiguous and narrational information down to a two-dimensional rating. But not all their qualitative information was encoded into their own category system. Instead, it remained in the ledgers. The other results in table 5 reveal that Dun possessed ledger information which had predictive value, and which wasn't presented to clients through the published ratings. Whatever their method of calculation, ratings did not embody a "signal" that had been neatly separated from ledger-based "noise." Depending on the model, an "x-rating" for pecuniary strength, slowness in payment, or refusal to make a statement to Dun, were also significant in predicting failure. An x-rating was directly visible to clients, although its meaning was opaque, but information

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[55] (Sheffield, V, p. 39) See also testimony at trial *Raymond* v. *Russell*, "Why He Wrote "Selah!" *Boston Globe* March 13, 1888, (evening) p. 1.
[56] "Ratings on Reports." "Various Matters to May, 1890." p. 95.
[57] "Reports Must Be Rated", circular to branch managers, May 11, 1896. Reproduced in Sheffield, XIII, p. 18-C. See also *The Mercantile Agency Manual. A Compilation of Rules and Regulations for the General Conduct of the Business.* Third Edition. 1897. New York: Exclusive Property of R.G. Dun & Co.)

about slowness in payment and refusal to make a statement were only available to subscribers who called at the Dun office. In a sense, Dun did not reveal to its clients all the credit-relevant information it possessed.

The agencies couldn't perform statistical tests, but our results indicate that ratings were too concise. Separate indicators for rating changes, slow pay, and giving statements would have been useful additions to the rating books. Indeed, later on the National Association of Credit Men strongly suggested that the agencies should publicly indicate whether or not a signed statement had been obtained before assigning the rating ("Address to the Mercantile Agencies," May 1898. *American Lawyer*, 6: 177). The agencies declined. Yet the concision of ratings was as much the result of agency attempts to protect intellectual property rights and avoid lawsuits as to improve the ability of subscribers to make credit decisions. Adding information about payment history would have made valuable intellectual property vulnerable to theft. Indicating publicly whether a financial statement had been given would have made clear how few ratings were based on that source, as well as how difficult it was for agencies to extract financial information from wary merchants. The predictive capabilities of ratings were subordinated to the business and organizational concerns of the agencies.

Conclusion

Using ranked categories to classify indebtedness was an idea that caught fire. Even before the end of the 19th-century, many specialist credit agencies were established to provide information on specific industries (Prendergast and Steiner 1931: 157-159).

Starting in 1909, John Moody applied the idea of credit rating to railway bonds and then rated other publicly traded corporate securities (Partnoy 1999: 637-639). Credit ratings showed impressive portability as they were directly absorbed into the underwriting standards of credit insurers and into the regulations governing insurance company investments (Prendergast and Steiner 1931: 402-403; Kerwer 2001:16-17). In parallel fashion, New England banks abandoned their old system of network-based insider lending and instead established formal credit departments that used financial information, including the ratings, to determine the creditworthiness of their customers (Lamoreaux 1994: 104-105). Later, the ratings issued by Moody's and S&P were incorporated into federal and state prudential regulations, and were increasingly used as "triggers" in private financial contracts (Langohr and Langhor 2008: 104). Today, all manner of rating goes on: individuals, small businesses, and large corporations all have their creditworthiness rated, and investors use ratings to calibrate financial risks (see, e.g., Jeacle and Walsh 2002, Lewis 1994, American Savings and Loan Institute 1971, Zuckerman 1999, Gelpi and Julien-Labruyère 2000). Private U.S. corporations cannot sell their bonds publicly without a rating from an agency like Moody's or Standard and Poor's, and public entities like municipalities, state governments, and even nation states have their debt obligations rated using an ordinal category system that looks very much like what Dun had developed by the 1860s. The basic categorization scheme invented by Dun, and adopted by its competitors, has become ubiquitous. If the "audit society" has a single panoptic device, credit rating could well be it (Power 1997).

As a device for creating economic knowledge and as a commodification of expertise, credit rating has become widespread and influential (Fight 2001, Akhavein et

al. 2001, Marron 2007, Sinclair 2005). Ratings now provide precise, systematic, convenient information about the creditworthiness of debtors, and they constitute a cognitive framework for lenders (Dobbin 2004). We need to recognize, however, that quantitative information has limits, despite the "scientific" connotations of objectivity, accuracy, and precision. These limits became obvious from the rating agencies' spectacular failures in the recent financial crisis, but they were also evident in 19th-century credit-rating. Ratings offered a new type of "hard" information, markedly different in format to the relationship-based "soft" information that creditors, suppliers, and lenders were already using. But by themselves ratings could not solve the trust problems that credit always posed. Most likely, they were used to help initiate business relationships between strangers. Thereafter, creditors could rely on relationship-based information to figure out how much to trust a customer. So as a new device to deal with trust problems, it seems that ratings both supplanted and augmented older methods.

Despite their limits, quantitative credit-rating spread widely throughout the 19th-century. The question remains: if ratings were only marginally useful to forecast business failure, then why did they proliferate? After all, they were laborious to produce and distribute, and would scarcely be worth the bother unless they possessed some value. By the early 20th-century, financial handbooks were almost unanimous in asserting the usefulness of credit rating, so it is hard to avoid the conclusion that they must have been good for something.

One part of the answer may concern the absence of systematic tests of predictive ability. Today, rating agencies offer detailed statistics which show that, for example, highly rated corporate bonds are less likely to default than low rated bonds (Standard and

Poor's 2009). In the 19th-century, by contrast, rating agencies provided no such direct feedback on the performance of their ratings. Indeed, firms that failed were often simply deleted from the next edition of the reference books, quietly disappearing without a trace, and Dun's contract stipulated that its subscribers turn in their old reference books when they received new ones. Thus, credit raters didn't make it easy for customers to directly evaluate the usefulness of ratings, nor to track ratings over time. Furthermore, although we know that the ledgers contained useful information, subscribers who requested a detailed written or oral report on a firm would have received a melange of unsystematic "soft" information and would themselves have had to sift out the useful pieces of information, with only limited guidance from the rating agency. How to assess the predictive quality of information remained a problem.

Besides prediction, Dun customers could have used ratings in a number of different ways, and these may also help explain their spread. First, ratings were used by subscribers for marketing purposes. Even if they weren't good at predicting failure, ratings could still be valuable at identifying potential customers, and describing their commercial activities. A wholesaler in New York City who wanted to know the biggest dry goods retailer in Beloit Wisconsin, for example, would have found the Reference Books useful.[58] Second, ratings may have been good for signaling problems that fell short of complete disaster. Outright failure was an undesirable extreme event, but less dramatic outcomes still hurt creditors and therefore were to be avoided. Ratings could signal that it was time to get debtors to settle their accounts. Third, published ratings may have functioned as a sign to gather more information. Lenders could use the ratings to decide

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[58] Indeed, the agencies published "pocket editions" designed especially for "commercial travelers" to be able to take on the road with them.

whether to look more carefully at a borrower's situation, or to obtain an in-depth credit report from the agency. Indeed, this is what Dun urged its subscribers to do, especially with blank ratings. Fourth, ratings were used to help monitor firms that users were already doing business with, and to corroborate other sources of information. Fifth, reference books allowed subscribers to track information on their own creditworthiness, and learn how they looked to their own suppliers and creditors (see Philadelphia Inquirer, September 29 1879, p.3). [59] Sixth, ratings were used by various groups to assess and price risk: banks used ratings to check endorsers of commercial paper, insurance companies used ratings to evaluate applicants for life and fire policies,[60] and credit insurers used ratings to price insurance.[61] Finally, it may be that the symbolic value of ratings compensated for their instrumental deficiencies (Meyer and Rowan 1977, Carruthers and Espeland 1991). By the end of the 19th-century there was a strong consensus that credit ratings were useful and necessary, and highly codified knowledge brought with it the patina of objectivity, modernity, and rationality, connotations that the business community surely valued (Feldman and March 1983, Porter 1995). In the wake of financial losses, the use of ratings could help bolster a credit manager's claim that he had gathered all relevant information and done due diligence. Ratings may thus have functioned more as retrospective rationalizations rather than as tools of prospective rationality. In this regard, they helped set the stage for later legal developments which protected fiduciaries (e.g., trust or fund managers) from poor performance if the fiduciary had acquired investment grade securities (Coffee 2006: 294).

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[59] Subscribers were contractually restricted from asking for *reports* on their competitors, but they could readily view their own ratings.
[60] R.G. Dun & Co., 1897. "Insurance Inquiries, etc." *Mercantile Agency Manual*, 3d edition, p. 27.
[61] R.G. Dun & Co., 1897. "Blank Ratings" *Mercantile Agency Manual*, 3d edition, p. 37.

The usefulness of ratings and the category system they embodied didn't only concern Dun subscribers and customers. Most importantly, ratings had to be useful to the for-profit rating agencies that produced them. This posed two other key considerations that affected how the agencies operated. Ratings were a commodity, a new form of intellectual property. Consequently, rating agencies were concerned to prevent others from violating their intellectual property rights. They were particularly worried that competitors would simply copy, pirate, or plagiarize their ratings. Clients were prohibited from sharing their reference books with others, they were required to return their old editions in order to get the new ones, and the agencies kept some information out of the reference books for fear that it would be stolen. Vigilance in protecting intellectual property ensured that rating agencies monopolized for themselves whatever economic value their information generated.

The second major consideration involved the status of ratings as a type of communication. What legal liabilities did such communication entail? Rating agencies worried that firms which didn't like the rating they received would charge that the rating constituted libel, and that clients using the ratings in credit decisions that turned out badly would charge that an agency's ratings were inaccurate or deficient. In other words, agencies worried about the legal consequences of what we termed above "type I" and "type II" errors. After decades of litigation and court rulings, refinements in contract language, and adjustments to the format of information, agencies eventually gained a measure of protection from lawsuits.[62] Furthermore, agencies became cannily ambivalent

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[62] Ratings remained somewhat vulnerable because they did not gain the status of "privileged communications." However, between the vagueness of ratings, the difficulty in proving causality for adverse consequences due to a wrong rating, and enforcement of contract stipulations that held subscribers liable for suits resulting from sharing information, except in cases of egregious mistakes regular ratings

in promoting the virtues of ratings: in public they spoke forcefully in favor of their

product but avoided making unambiguous promises that they might not be able to keep.[63]

Protection of property rights and fear of lawsuits were two primary considerations for the

rating agencies that tempered and shaped the overall usefulness of ratings.

It is tempting to view the spread of ratings, and the invention of the category

system that undergirded them, as part of an overall process of quantification and

increasing rationalization, with concomitant improvements in accuracy, objectivity and

specificity. Over the 19th-century, a growing consensus emerged that Agency-supplied

credit information was useful, and this undoubtedly helps explain why the market for

ratings grew so much. The ostensible "use" of ratings was to help clients to manage credit

better. But using a direct and strong test of this kind of "usefulness" (the ability to predict

failure), we saw that 19th-century credit ratings did not perform well. Indeed, while the

ratings looked precise and seemed as though they would make credit decision-making

"simple" and available "at a glance," ratings also absorbed a great deal of vital

information: not just about the "real" world, but also about the epistemology of the report

and rating production process. And while the credit information industry thrived,

mercantile agencies could never fully domesticate their customers, who always

threatened to use credit information in ways that worried the agencies. Instead, it seems

that other uses played a role, both in the production of reports and ratings by agencies,

and in their consumption by clients. If 19th-century credit ratings failed as predictors,

however, they succeeded as informational commodities, albeit after a great deal of social,

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infrequently provoked lawsuits. (For suits over sharing information see Circular to subscribers and
managers, "Divulging Unfavorable Information" November 20, 1884, recounted in *Boston Evening Globe*
March 7, 1888, p. 5; "Important Decision in a Libel Suit," *Cleveland Herald*, January 27, 1884, p. 1; "An
Important Decision, "*New York Times*, November 20, 1885, p. 3)

[63] Today ratings are legally just "opinions" about the future.

organizational and legal labor to make the distribution of information safe for the

mercantile agencies. In this respect, they anticipated the problematic role played by

modern credit ratings in the lead-up to the financial crisis of 2008, where agencies earned

a lot of money providing what turned out to be inaccurate ratings for financial products

like CDOs. Quantification, it turns out, is about much more than just being right or

wrong.

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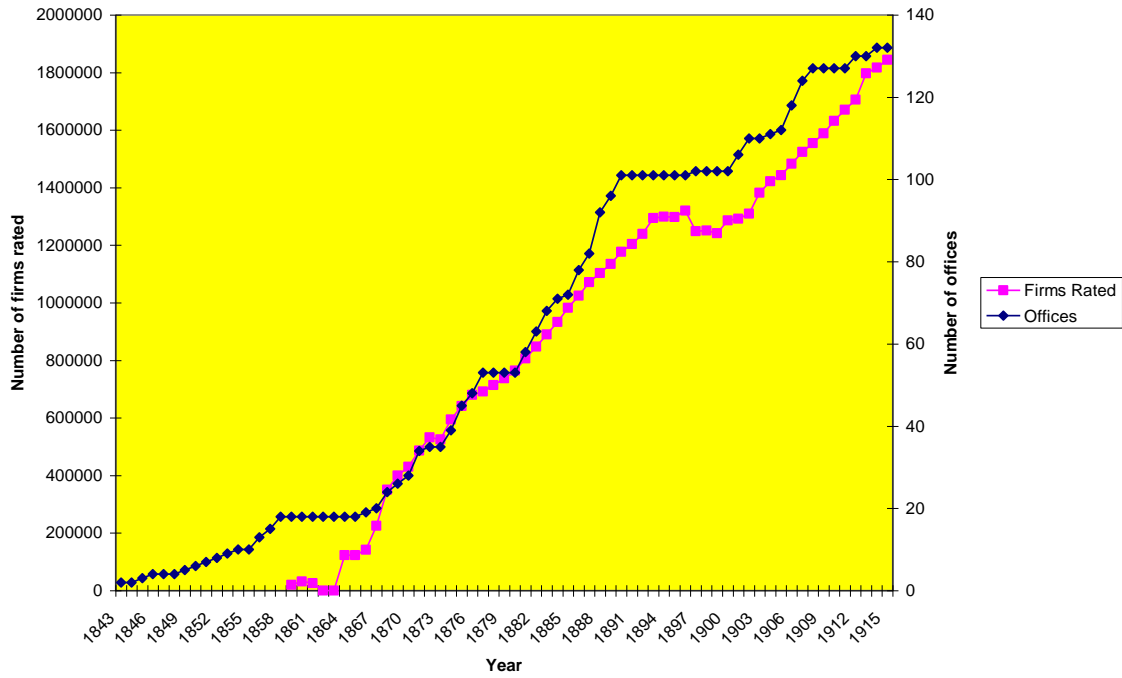**Figure 1: Growth of R.G. Dun (firms rated and total offices)**

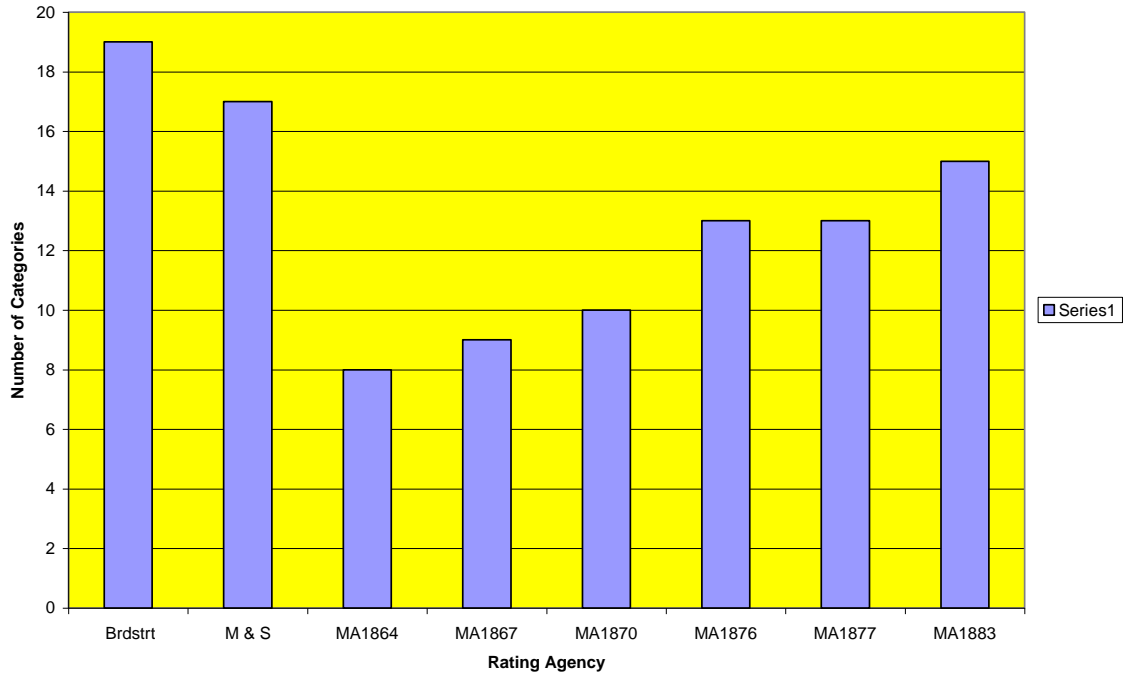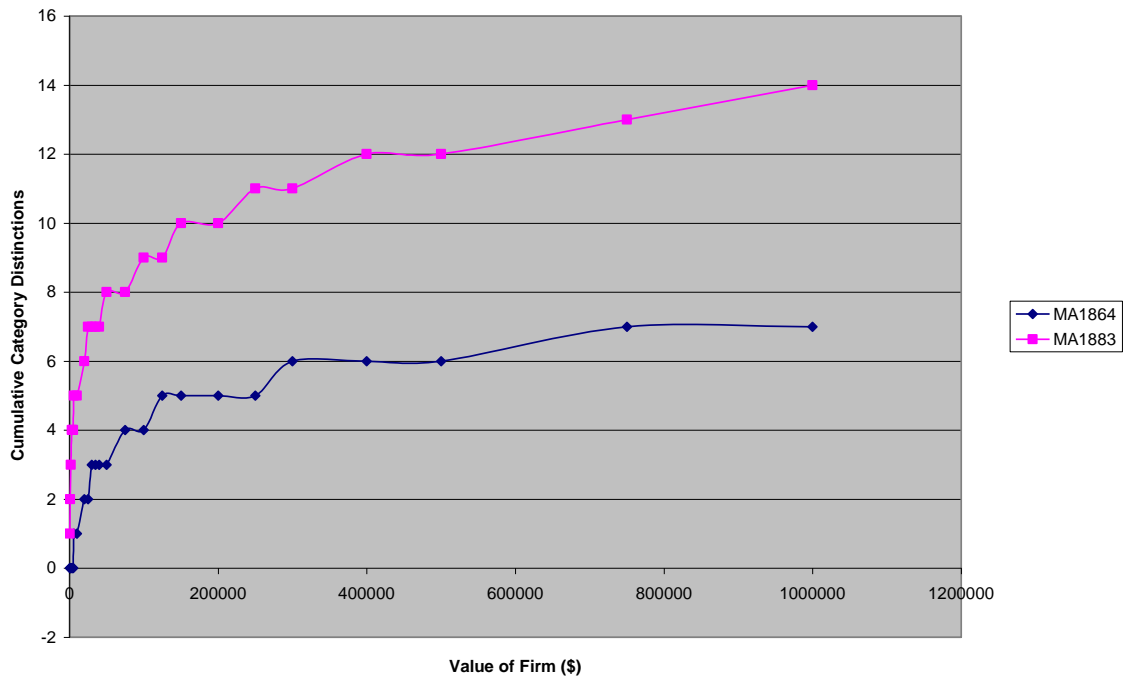**Figure 2: Total Categories of Pecuniary Strength**

Figure 3: Credit Rating Schemes, 1864 and 1883

```
                              KEY
        PECUNIARY STRENGTH                    GENERAL CREDIT
         (Left-hand column.)                  (Right-hand column)

  A1+   $1,000,000 or over          |    A1          Unlimited
  A1      500,000 to   1,000,000    |    1    }
  1       250,000 to    500,000     |    1½   }      High
  1½      100,000 to    250,000     |
  2        50,000 to    100,000     |    2    }
  2½       25,000 to     50,000     |    2½   }      Good
  3        10,000 to     25,000     |    3    }
  3½        5,000 to     10,000     |    3½   }      Fair

                    ? Inquire at our Office.  *
```

* This embraces not only those of questionable credit, but also those whose business and investments render it difficult to rate them satisfactorily to ourselves. We therefore prefer, to justice to these, to give our detailed report.

   A dash thus — prefixed to a name, indicates that a change in style or ratings has occurred since the book was printed, the nature of which can be learned by inquiry at our office. We recommend holders of the Book, for their own security, to mark similarly all names regarding which they may subsequently receive intimation of change through our regular printed notification.

⟹ The ratings in the two columns of the Key have no absolute connection -- those in the Credit column being higher or lower (as compared with pecuniary resources), according to the personal and business qualities represented, and the nature, hazard, and extent of business, &c.

   Where no marking is given indicative of pecuniary strength, the capital is estimated less than $5,000.

Dun "Key" 1864-65

EXPLANATORY KEY						
LEFT-HAND COLUMN			RIGHT-HAND COLUMN			
ESTIMATED PECUNIARY STRENGTH			GENERAL CREDIT			
			High	*Good*	*Fair*	*Limited*
AA	Over $1,000,000		A1	1	1½	2
A+	750,000 to	$1,000,000	A1	1	1½	2
A	500,000 to	750,000	A1	1	1½	2
B+	300,000 to	500,000	1	1½	2	2½
B	200,000 to	300,000	1	1½	2	2½
C+	125,000 to	200,000	1	1½	2	2½
C	75,000 to	125,000	1½	2	2½	3
D	40,000 to	75,000	1½	2	2½	3
E	20,000 to	40,000	2	2½	3	3½
F	10,000 to	20,000	2½	3	3½	4
G	5,000 to	10,000		3	3½	4
H	2,000 to	5,000		3	3½	4
K	1,000 to	2,000			3½	4
L	Less than	1,000			3½	4
M	Less than	500			3½	4
			1½	2	3	4

   The absence of a Rating indicates those whose business and investments render it difficult to rate them satisfactorily to ourselves. We therefore prefer, in justice to these, to give our detailed reports on record at our office.

Dun Explanatory Key January 1882

FIGURE 4: DUN KEYS

TABLE 1a: Correlations of 17 Ratings of "Pecuniary Strength," 1875-1884: Dun, Bradstreet's, and McKillop-Sprague.

	D175P	B175P	D775P	D976P	M777P	D977P	D378P
Dun175P	1.0000						
Brad175P	0.9233	1.0000					
Dun775P	0.9938	0.9144	1.0000				
Dun976P	0.9786	0.9052	0.9847	1.0000			
McK777P	0.9225	0.9170	0.9208	0.9231	1.0000		
Dun977P	0.9784	0.9228	0.9814	0.9862	0.9271	1.0000	
Dun378P	0.9651	0.9282	0.9690	0.9710	0.9317	0.9867	1.0000
Dun779P	0.9597	0.9013	0.9584	0.9592	0.9486	0.9708	0.9800
Brad779P	0.9064	0.9063	0.9017	0.9084	0.9329	0.9256	0.9402
Dun979P	0.9538	0.8938	0.9532	0.9534	0.9430	0.9661	0.9779
Dun180P	0.9445	0.8958	0.9443	0.9446	0.9361	0.9550	0.9664
Dun980P	0.9370	0.8794	0.9342	0.9347	0.9310	0.9486	0.9604
Dun981P	0.9112	0.8602	0.9105	0.8990	0.9135	0.9116	0.9203
Dun183P	0.8760	0.8282	0.8753	0.8698	0.8955	0.8839	0.8911
Dun783P	0.8662	0.8166	0.8661	0.8604	0.8813	0.8669	0.8721
Dun983P	0.8568	0.8279	0.8569	0.8631	0.8825	0.8691	0.8781
Dun384P	0.8599	0.8235	0.8586	0.8642	0.8726	0.8623	0.8706

	D779P	B779P	D979P	D180P	D980P	D981P	D183P
Dun779P	1.0000						
Brad779P	0.9447	1.0000					
Dun979P	0.9968	0.9489	1.0000				
Dun180P	0.9857	0.9423	0.9886	1.0000			
Dun980P	0.9743	0.9334	0.9766	0.9839	1.0000		
Dun981P	0.9446	0.9102	0.9456	0.9489	0.9706	1.0000	
Dun183P	0.9086	0.8749	0.9078	0.9158	0.9443	0.9729	1.0000
Dun783P	0.8866	0.8402	0.8881	0.8940	0.9264	0.9514	0.9764
Dun983P	0.8869	0.8446	0.8896	0.8951	0.9268	0.9499	0.9751
Dun384P	0.8833	0.8409	0.8849	0.8918	0.9170	0.9441	0.9693

	D783P	D983P	D384P
Dun783P	1.0000		
Dun983P	0.9989	1.0000	
Dun384P	0.9899	0.9910	1.0000

TABLE 1b: Correlations of 17 Ratings of "General Credit," 1875-1884: Dun, Bradstreet's, and McKillop-Sprague.

	D175C	B175C	D775C	D976C	M777C	D977C	D378C
Dun175C	1.0000						
Brad175C	0.7901	1.0000					
Dun775C	0.9672	0.7648	1.0000				
Dun976C	0.9274	0.8019	0.9559	1.0000			
McK777C	0.8711	0.8090	0.8713	0.8752	1.0000		
Dun977C	0.9085	0.8225	0.9231	0.9360	0.9104	1.0000	
Dun378C	0.9050	0.8339	0.9200	0.9301	0.9210	0.9853	1.0000
Dun779C	0.8857	0.8086	0.8802	0.8822	0.9011	0.9438	0.9591
Brad779C	0.6882	0.6794	0.6512	0.6166	0.6959	0.6528	0.6868
Dun979C	0.8709	0.8258	0.8657	0.8739	0.8890	0.9232	0.9444
Dun180C	0.8843	0.8233	0.8779	0.8818	0.8958	0.9217	0.9418
Dun980C	0.8661	0.7977	0.8540	0.8739	0.8840	0.9013	0.9278
Dun981C	0.8269	0.8154	0.8145	0.8333	0.8871	0.8619	0.8860
Dun183C	0.5269	0.7098	0.4934	0.5274	0.5395	0.5333	0.5786
Dun783C	0.5289	0.6850	0.4967	0.4502	0.5195	0.4507	0.4914
Dun983C	0.5059	0.6670	0.4747	0.4016	0.5223	0.4171	0.4452
Dun384C	0.4831	0.6160	0.4481	0.3784	0.4984	0.3969	0.4153

	D779C	B779C	D979C	D180C	D980C	D981C	D183C
Dun779C	1.0000						
Brad779C	0.7219	1.0000					
Dun979C	0.9770	0.7289	1.0000				
Dun180C	0.9602	0.7123	0.9820	1.0000			
Dun980C	0.9447	0.6786	0.9591	0.9779	1.0000		
Dun981C	0.8988	0.6758	0.9097	0.9241	0.9264	1.0000	
Dun183C	0.6320	0.6306	0.6608	0.6600	0.6799	0.7327	1.0000
Dun783C	0.5500	0.5636	0.5874	0.5983	0.6179	0.6863	0.8757
Dun983C	0.4944	0.5400	0.5150	0.5315	0.5555	0.6358	0.8268
Dun384C	0.4891	0.5562	0.5083	0.5231	0.5396	0.6311	0.8305

	D783C	D983C	D384C
Dun783C	1.0000		
Dun983C	0.9694	1.0000	
Dun384C	0.9223	0.9542	1.0000

Table 2: List of Variables

AVERAGE PS: Firm pecuniary strength, averaged across Dun ratings 1877 and later

AVERAGE GC: Firm general credit, averaged across Dun ratings 1877 and later

LATEFAIL: Did firm fail in 1877 or later? 1=yes, 0=no.

JEW: Is owner/proprietor Jewish? 1=yes, 0=no.

FEMALE: Is owner/proprietor Female? 1=yes, 0=no.

EARLYPS: Firm pecuniary strength in 1877 or before, averaged across all ratings (high scores mean high worth).

EARLYGC: Firm general credit in 1877 or before, averaged across all ratings (high scores mean poor credit).

PSDIFF2: Change in firm pecuniary strength, 1875-1877.

GCDIFF2: Change in firm general credit, 1875-1877.

EARLYXP: Firm given "x-rating" for pecuniary strength in 1877 or before (the firm is listed but not rated, and readers are referred to the agency office).

EARLYXC: Firm given "x-rating" for general credit in 1877 or before (the firm is listed but not rated, and readers are referred to the agency office).

EARLYSTATE: Number of statements made by firm to rating agency in 1877 or before.

EARLYSTRANGE: Number of times agency noted strangers shouldn't extend credit to firm in 1877 or before.

EARLYSLOW: Number of times agency noted firm slow in making payments in 1877 or before.

EARLYNOSTATE: Number of times firm refused to make statement to rating agency in 1877 or before.

REAL ESTATE: Does the proprietor of the firm own real estate? 1=yes, 0=no.

Table 3: Univariate Statistics (overall n=247)

Variables:	Mean	Standard Deviation
LATEFAIL	0.065	0.247
JEW	0.089	0.285
FEMALE	0.095	0.294
EARLYPS	6.268	3.587
EARLYGC	4.049	0.532
AVERAGE PS	6.523	3.948
AVERAGE GC	3.763	0.713
PSDIFF2	0.181	0.851
GCDIFF2	0.043	0.250
EARLYXP	0.227	0.420
EARLYXC	0.206	0.406
EARLYSTATE	0.644	0.951
EARLYSTRNGE	0.101	0.363
EARLYSLOW	0.271	0.848
EARLYNOSTAT	0.170	0.427
REAL ESTATE	0.386	0.488

TABLE 4: Average Pecuniary Strength (PS) and General Credit (GC), OLS regression with clustering

	Average PS	Average GC
Female	-3.24 ***	0.498 ***
Real Estate	2.35 ***	-0.416 ***
Earlystate	1.28 ***	-0.159 ***
Earlyslow		0.114 **
Earlynogencr	-0.480 ***	0.192 ***
R-Square	0.2441	0.2084

Table 5: Logistic Regression of Firm Failure, Chicago 1875-1884.

<u>Dependent Variable</u> (1,0): does a Chicago dry goods firm fail during 1877-1884 period?
(16 firms fail.)

Odds Ratio coefficients for Logistic Regression of Failure, with Huber-White robust estimates of standard errors

Models	1	2	3	4	5	6	7	8	9
Jew	0.667 NS								
Female		drops out							
Earlyps			1.032 NS	0.872 NS		0.876 NS	0.856 NS	0.885 NS	
Earlygc			0.223 NS	0.612 NS					
Psdiff2					0.367 **	0.430 ***	0.432 **	0.459 **	0.427 ***
Gcdiff2					1.819 NS				
Earlyxp							0.163 *		
Earlystate								0.919 NS	
Earlyslow				1.580 *			1.607	1.283 NS	
Earlynosta						2.786 *			2.537 **
Pseudo-R^2	.001		.007	.047	.083	.144	.135	.178	.123

* = sig at 0.1 level; ** = sig at 0.05 level; *** = sign at 0.01 level; n.s. = non-significant