

Historical Financing of Small- and Medium Size Enterprises

Robert Cull
The World Bank

Lance E. Davis
Social Sciences, California Institute of Technology, and NBER

Naomi R. Lamoreaux
Economics and History, UCLA, and NBER

and

Jean-Laurent Rosenthal
Economics, UCLA, and INRA-LEA, Paris

Historical Financing of Small- and Medium-Size Enterprises

R. Cull, L. Davis, N. Lamoreaux, J.-L. Rosenthal

1. Introduction

The size distribution of firms in today's developed economies is very different from that in developing ones. In the poorest countries, on average almost two thirds of workers are employed in very small (micro) enterprises—that is, enterprises with less than five employees—and most of the rest work for large enterprises with more than one hundred employees. Small- and medium-size firms have little presence in these economies and together employ less than 10 percent of the total workforce. By contrast, in the richest countries more than two thirds of all employees work for large enterprises, the bulk of the remainder work for small- and medium-size enterprises (SMEs), and only a very small fraction for micro enterprises (Snodgrass and Biggs 1996). Although large firms account for the lion's share of aggregate economic activity in developed countries, SMEs play a more significant role in these economies than their proportion of total employment might suggest. Not only do they make up the vast majority of firms, but they dominate many sectors of economic activity and have been an ongoing source of new products and of technological innovation more generally.

One possible explanation for the relative absence of SMEs in poor economies is the difficulty of obtaining access to finance. Large firms in these countries can secure financial assistance because they have assets that can serve as collateral for loans, because their directors also serve on the boards of financial institutions, and/or because

they receive special government backing. Other enterprises, however, have to rely largely on their proprietors' financial resources, which are likely to be limited, and on retained earnings, which, given the general poverty of the populations that they serve, cannot be large. Without outside sources of funds, therefore, such firms are condemned to start and remain very small.

A recent survey of funding sources for businesses in forty developing nations conducted by the World Bank confirms this general picture.¹ Larger firms generally have more access to bank credit, both local and foreign, than small firms, whereas the latter rely heavily on internal funds and retained earnings. Nonetheless, the survey suggests that there is considerable heterogeneity across countries in sources of finance for small- and medium-size firms. For example, in about a quarter of the countries small firms obtain more than ten percent of their funds from trade credit, and in 40 percent from local commercial banks (see Table 1). In general, the countries in which SMEs have access to these kinds of external sources of funds are those with more advanced financial systems, raising the question of the causal relationship between financial development and the viability of SMEs.

Because it is difficult to disentangle this relationship with cross-sectional data, we approach the problem by scrutinizing the historical literature for insight into the role that new financial institutions play in the growth of small- and medium-size enterprises. It is important, however, to begin by noting that the heterogeneity of firm sizes that characterizes today's developed economies was itself a product of industrialization. Before these economies began to grow and develop, virtually all firms everywhere were

¹ The study was conducted by the Investment Climate Surveys (ICS) in 2002-2003 in forty developing countries in Europe, Asia, Africa, and Latin America.

very small. Beginning in the late eighteenth and early nineteenth centuries, technological change increased both the average size of firms and the extent of the variation. In some of the new industries that resulted firms had to be large in order to survive. The railroad industry is a good example, as is cigarettes (Chandler 1977). In other industries, however, average firm size remained small despite important changes in technology. In the machine tool sector, for instance, SMEs not only survived and prospered, but continued to be sources of important technological developments (Soltow 1965; Scranton 1998). Still other industries were more unevenly affected by technological change. In the steel and glass industries, for instance, new processes dramatically raised the scale of production of some goods (for example, steel rails, sheets, and tinplate, and glass bottles and window panes), whereas other goods, such as cast steel, terne plate, and pressed glass continued to be best produced in small foundries, dipping works, and glass furnaces (Temin 1964; Lamoreaux 1985; Lamoreaux and Sokoloff 2000).

The growth in the size of markets had similarly heterogeneous consequences for trends in the size distribution of firms. On the one hand, the expansion in geographic scope that resulted from falling transportation costs and the reduction of trade barriers created opportunities for large-mass production enterprises. On the other, rising per capita income meant that consumers increasingly had the wherewithal to indulge their tastes, creating lucrative market segments that small firms were best suited to satisfy (Sabel and Zeitlin 1997; Lamoreaux, Raff, and Temin 2003). In textiles, for example, coarse fabrics tended to be mass-produced in large, vertically integrated factories. As one moved up the scale of fineness, however, firms tended to become smaller and less vertically integrated. Indeed, in the high-end segments of the industry, where the ability

to respond quickly to changes in fashion was an advantage, firms tended to be small, to specialize in a particular process or technique, and to collaborate with other small, highly specialized firms in order to satisfy customers' wants (Scranton 1983 and 1989; Enright 1995).

Industrial development thus gave rise not only to small numbers of very large firms but also to large numbers of firms of small and intermediate sizes. The relative proportions of each varied across industries and countries with patterns of specialization. French textile firms, for example, tended to produce more high-end goods than British or U.S. firms and hence to be relatively smaller on average. But, as Janice Kinghorn and John Nye have shown, small and medium size enterprises were an important part of the economies of all the major industrial economies in the early twentieth century (see Table 2). In Germany, for example, the average percentage of employees in enterprises with more than fifty employees varied from 13 in the food sector to 38 in textiles to 70 in chemicals to 98 in iron and steel. In France the percentages were very similar: 8, 46, 64 and 100 respectively. Even in the U.S., where the percentages were more uniformly high (67, 93, 85, and 99), there were lots of SMEs. The average number of employees in establishments employing 50 workers or more in these industries—123, 199, 138 and 576 respectively—suggests that median firm size was quite low (Kinghorn and Nye 1996).² Moreover, as Jeremy Atack has shown, even as large-scale enterprises came to dominate

² Similar breakdowns are not available for Britain. The available data suggests that average establishment size was similar in those of the U.S. and higher than in France and Germany, but because of differences in the extent to which the various censuses covered very small enterprises, these comparisons are not very reliable. Breakdowns for France using size categories similar to the modern data indicate that in 1906 micro enterprises accounted for 53 percent of total employment, small firms 10 percent, medium 12 percent, and large 25 percent. By 1931 there was a dramatic fall in the share of micro firms to 28 percent. In that year, small firms accounted for 13 percent, medium 18 percent, and large 42 percent (Lescure 1999).

important sectors of the U.S. economy during the late nineteenth century, the number of smaller firms continued to expand rapidly (Atack 1986 and 1987).

The purpose of this paper is to explore the role that access to finance played in generating this distribution of firm sizes—that is, the role it played in enabling firms to form at scales that were efficient for their industries and market segments, and in enabling them to grow and take advantage of new technological developments and of increases in the size and scope of markets. We begin by examining the history of the main institutions associated with modern finance—securities markets and banks. As we demonstrate, although these institutions were important providers of capital to large-scale enterprises, they were of marginal significance to small- and medium-size firms.

Although SMEs tended to be formed with equity obtained through personal connections and to depend on retained earnings for growth, they did need access to finance for working capital, to withstand adverse business conditions, and to take advantage of new technologies and opportunities. As we show, an impressive variety of local institutions emerged to supply these needs wherever there was sufficient demand. Governments played little role in creating these institutions, and the regulatory constraints they imposed on the financial system tended to interfere with large firms more than with SMEs. Nonetheless, we argue, governments could encourage this process by creating a secure property-rights environment and by establishing national financial institutions, such as central banks, that helped to mitigate shocks at both the national and local levels.

We focus in this paper on what might be labeled the North Atlantic Core—the economies of northern and western Europe and North America that industrialized successfully over the period that stretched from the late eighteenth to the early twentieth

centuries. We focus on these economies because their histories have been most deeply researched. Nonetheless, it is important to emphasize that, even in these cases, relatively little work has been done on the finance of SMEs, particularly little quantitative work. Hence much of what follows draws of necessity on qualitative evidence, and on the histories of individual industries and firms.

2. Institutions of Modern Finance

In the North Atlantic core, both organized securities markets and sophisticated financial intermediaries emerged well in advance of industrialization, but in the nineteenth century these institutions evolved in ways that enabled them to mobilize capital on a much larger scale than ever before. In this section we discuss these changes and underscore their importance in financing railroads and other types of heavy industry. As we also show, however, these institutions were only of tangential importance to small- and medium-size firms. Very few SMEs were organized in ways that allowed them to sell shares of their enterprises to outsiders. Not only, therefore, were they not in a position to raise equity on the exchanges, they could not benefit from the combination of commercial and banking services that large universal banks provided. All that universal banks, or for that matter any commercial banks, could offer them were short-term loans, but the informational problems associated with assessing the creditworthiness of small- and medium-sized enterprises, especially those located outside financial centers, meant that the entrepreneurs who founded them generally had to find other sources of funds.

2.1. Equity Markets

Formal equity markets emerged in Europe during the early eighteenth century to facilitate the sale of long-term government debt. By this time, there was already a significant amount of market trade in commodities and in short-term commercial and government paper (Gelderblom and Jonkers 2004), but long-term government debt was generally illiquid, even though it might be widely held (Hoffman, Postel-Vinay, and Rosenthal 2000; Tracy 1985). During the period 1689 to 1713, however, a massive rise in military expenditures forced governments to find new ways of raising funds, stimulating a series of innovations both in the types of securities they issued and in the organization of the markets that traded them (Dickson 1967).

One innovation was a new financial instrument: perpetual government bonds. When a government issued these bonds, it committed itself to pay a fixed rate of interest every year in perpetuity, but it could retire the debt whenever it wanted. Not surprisingly, given the rapidly increasing size of national debts during this period, bonds were rarely retired except when interest rates fell and the government exchanged outstanding obligations for ones with a lower coupon value. Hence there was always a large number of bonds to be traded. A second key innovation was the organization of centralized exchanges to facilitate and regulate trade in these securities. In some places private individuals set up the exchanges, in others city governments, and in still others the state (Davis and Neal 1998). Although the exchanges provided liquidity, governments still faced the thorny problem of how to get their debt into the hands of the public to begin with. Traditionally, governments had issued short-term debt to financiers at a discount and had placed long-term debt with the public by fiat at par. These methods had worked

well for city states or in cases where the target clienteles were restricted, but by the early eighteenth century the size of the placements meant that soliciting voluntary investors was critical, especially investors from outside the capital city and foreigners. These could only be reached with the aid of private intermediaries, and so a third major innovation was the use of underwriters, most of whom were bankers.

Although there was considerable variation in the extent to which these innovations were adopted, by the early nineteenth century they had spread to a number of important European countries, including the United Kingdom, France, the Netherlands, Prussia, and Austria. Still other countries which developed limited domestic capital markets (for example, Spain, Portugal, Two Sicilies, and Bavaria) drew upon those of their richer neighbors. In all of these countries, the exchanges were organized specifically for the purpose of trading in long-term government debt, but from the beginning they also handled the securities of privileged companies—that is, companies chartered by, and in the interests of, their governments. The earliest of these companies were organized to conduct long-distance trade, but the category expanded over time to include financial services, transportation systems, and other kinds of infrastructural improvements. In the nineteenth century, the set of issues traded on the exchanges expanded still further with the addition of companies that had no special relationship to the state, particularly in finance, transportation, and mining. It was still comparatively rare, however, for manufacturing firms to be listed (Mitchie 1999, Harris 2000).

The lack of trading in manufacturing securities seems to have resulted largely from demand-side causes, as an examination of the operation of the most important of these exchanges suggests. By 1800 the London Stock Exchange was the largest in the

world, and it would remain so at least through the end of the century. The diversity of securities traded on the exchange increased steadily until the 1850s and then accelerated during the second half of the century as London became a major exporter of capital (Davis and Huttenback 1986, Mitchie 1999). But little of this finance went to domestic manufacturing until the merger wave at the end of the century, when a number of large manufacturing consolidations began to list their securities (Franks, Mayer, and Rossi, 2004).

The limited amount of trading in industrials before the merger wave cannot be blamed on the Exchange, which made no effort to restrict the kinds of securities listed. Indeed, it was in the interests of the Exchange's private owners to expand trading as widely as possible. But most manufacturing firms apparently did not find it worth their while to list. Instead, to the extent that they sought a market for their securities, they preferred to rely on the local exchanges that sprang up in most large industrial cities. Because these cities tended to be specialized in their manufacturing activities, locals had a great deal of knowledge of the firms that were issuing equity. They also frequently knew the entrepreneurs personally. Hence local securities markets faced fewer informational asymmetries and could more easily sustain the trust necessary to elicit investment (Thomas 1973, ch. 6-7). Nevertheless, even on these local markets, only the securities of the largest manufacturing firms traded. Because the bulk of the stock of most manufacturing corporations was closely held, not enough reached the market to sustain regular trading. As a result, the markets could not perform their twin functions of providing owners with liquidity and signaling companies' value to potential investors, and firms had little to gain from listing their securities.

In France, the situation was similar, even though the Paris Bourse was owned by the state, and government officials limited access to it. During the early part of the century only government debt and the securities of privileged companies could trade on the Bourse. These restrictions were gradually eased over time, but listing requirements remained onerous throughout the century. Nonetheless, the consequences of this regulation were not as serious as they might have been because an active curb market (the *Coulisse*) emerged, and there were also, as in Britain, regional exchanges. Moreover, although elite investment houses such as the Rothschilds specialized in government debt and in the securities of railroads and important corporations in heavy industry, there was also a large and competitive group of private banks that underwrote the securities of the firms that traded outside the Bourse. As a result of all these developments, the number of industrial firms whose securities were traded on the various exchanges increased quite dramatically over time. As in Britain, however, the majority of manufacturers never found it worth their while to list their securities. Indeed, as we shall see in Section 3.1, most adopted organizational forms that could not issue tradable shares (Plache 1999; Hautcoeur 1994).

In the United States, the restrictive listing requirements imposed by the New York Stock Exchange, whose broker-owners earned monopoly profits from controlling access, kept industrials from being traded there until the Great Merger Movement at the end of the century. Indeed, the situation was so bad that large U.S. manufacturing enterprises were more likely to list on the London Stock Exchange than in New York (Davis and Cull 1994). As in the case of France, however, other markets emerged. There were active regional exchanges in a number of important cities (for example, Boston,

Philadelphia, San Francisco), and a curb market developed in New York during the late nineteenth century. Again, however, only the securities of the largest manufacturing enterprises traded. For example, as late as the 1890s the Boston market quoted stock prices for only about a hundred manufacturing firms, though thousands of industrial corporations had been chartered in the New England region. According to a broker who attempted to compile a record of such trades, manufacturing stocks generally were held by people who did not intend to sell them. As a result, “it was exceedingly difficult to obtain reliable quotations,” even for the region’s largest enterprises, because the securities rarely appeared on the market “except in stray shares or in the case of executors’ sales” (Martin 1898, 126-32).

In Canada, both public and private bond issues found an easy outlet in England. Hence the Canadian securities markets functioned much like regional exchanges in the U.S. and the U.K., specializing in stocks issued by relatively large local firms. In Germany, the exchanges played a more limited role because most stocks were traded within the clienteles of very large banks (see Section 2.2). In the Netherlands, the precocious development of a large-scale market in short-term debt led manufacturers to limit equity holdings to principals and to raise capital by issuing short-term notes. Finally, there were regional exchanges in larger countries throughout Europe. These have not been much studied, but it seems that medium-size firms may have tapped them with the help of local banks (see, for example, Cayez 1978, 356-58).

In general, however, securities markets played a limited role in the finance of all but the largest manufacturing enterprises. The problem resided not so much with the markets but with the firms themselves. Even when they issued tradable securities, the

sizes of the issues were often too small to make it worthwhile to create a market for them or to invest in overcoming informational asymmetries about the securities' underlying value. Moreover, as we shall see in section 3.1, most SMEs did not issue tradable securities.

2.2. Banks

Historical studies of the role of banks in industrial finance have focused attention on what are called “universal banks”—that is, institutions that provided both commercial and investment banking services to their customers. In recent years, many scholars have argued that universal banks were particularly well suited to promote economic development because of the informational advantages associated with this combination of services. In the first place, banks accumulated knowledge about their customers through their regular commercial lending business, knowledge that enabled them to determine which firms were most likely to be good investment opportunities. They could then signal this information to the general public by underwriting the firms' securities. Second, because universal banks expected to develop multi-faceted relationships with their customers that would yield them significant opportunities for profit over the long-term, they were willing to provide early-stage financing to enterprises that would otherwise have found the cost of borrowing prohibitively expensive (Tilly 1986 and 1989; Benston 1994; Calomiris 1995; Da Rin 1996; Guinnane 2002).

Although private banks had long provided a mix of commercial and investment services to their customers (Tilly 1966; Guinnane 2002), the term universal bank is usually reserved for the large incorporated financial institutions that emerged in Europe

during the second half of the nineteenth century. The prototype for these giants was a Belgian corporation, originally chartered in 1822 as the Société Générale pour favoriser l'Industrie Nationale des Pays Bas. The Société began to play a significant role in industrial development during the 1830s when, in collaboration with the Rothschilds, it financed a number of coal, iron, and canal companies. Entrepreneurs in Belgium and elsewhere on the European continent attempted to emulate its success by founding competing institutions, but with several exceptions (most notably, the Banque de Belgique and the Société Générale de Crédit Mobilier in France), they were unsuccessful in securing corporate charters from their governments and had to rely on the commandite (limited partnership) form instead (Cameron 1965, Tilly 1998). Occasionally entrepreneurs were able to play states off against one to secure charters. For example, the Bank für Handel und Industrie (the Darmstädter Bank) was finally founded in Darmstadt in 1853, after its organizers tried unsuccessfully to secure charters from Prussia, Hesse, and Frankfurt (Cameron 1956; Guinnane 2002; Wellhöner and Wixforth 2003).

With the passage of general incorporation laws during the third quarter of the nineteenth century, the number of joint-stock banks grew. The increase was especially dramatic in Germany after 1870, when the number of universal-style banks jumped from 31 with a total capital of 375.6 million marks at the beginning of 1870 to 139 with total capital of 1,122 million marks just a year later. According to Volker Wellhöner and Harald Wixforth, the new banks “focused less on constructively financing industry than on seeking speculative profits in company foundations and public issues” (Wellhöner and Wixforth 2003, 155), and in 1873, 73 of them, with a total capital of 432 million marks, collapsed. The surviving banks absorbed many of the institutions that failed, starting a

process of consolidation that led to the dominance in Germany of the eight so-called “great banks.” These banks had branch networks that spread across several regions and, in addition, developed long-term correspondent relationships with regional and local banks throughout the country, often owning minority stakes in the largest of the outlying institutions (Guinnane 2002; Wellhöner and Wixforth 2003).

The great banks were universal banks, and it has long been argued that they played a critical role in German industrial development (Riesser 1911; Gerschenkron 1962). In Alexander Gerschenkron’s words, a “German bank . . . accompanied an industrial enterprise from the cradle to the grave, from establishment to liquidation throughout all the vicissitudes of its existence” (Gerschenkron 1962, 14). As our introduction to this subsection has already suggested, the development of the new economics of information gave this view of how German banks functioned new life. Thus Charles Calomiris has portrayed the great German banks “as ‘optimal mechanisms’ for connecting particular groups of savers and investors in a world of costly transactions and asymmetric information” (Calomiris 1995, 264), and Richard Tilly has emphasized the informational advantages that enabled the great banks to serve the financial needs of Germany’s largest industrial enterprises, help negotiate mergers, and even promote entirely new ventures in the high-tech industries of the time (Tilly 1986 and 1989).

By contrast, many scholars have argued that banks in Anglo-American countries were much less involved in economic development. According to Calomiris, regulatory restrictions on branch banking and on the kinds of assets that banks could hold prevented commercial banks in the United States from performing similar functions. As a consequence, the relative cost of capital to firms was higher and access to equity markets

more restricted than in Germany (Calomiris 1995; Calomiris and Raff 1995). Although British banks did not face the same regulatory restrictions, scholars have blamed their conservatism—their single-minded focus on the commercial side of their business—for that country's industrial retardation. To Michael Best and Jane Humphries, this stodginess prevented banks from becoming “a dynamic force in the reorganization of basic industry” (Best and Humphries 1998, 237). To William Kennedy, it kept Britain from successfully developing industrial leadership in second-industrial-revolution technologies (Kennedy 1987).

The idea that universal banks played a critical role in German industrial development, however, has been challenged by a number of scholars. Caroline Fohlin, for example, has pointed out that the great banks did not emerge until after the debacle of the early 1870s—that is, after the process of industrialization was well underway—and that, even then, their impact does not seem to conform to the claims of their admirers. Fohlin studied a sample of German firms and found that, after controlling for a variety of characteristics, there was no statistical association between connection with a universal bank (proxied by having a bank representative on the firm's supervisory board) and rates of investment, debt-to-equity ratios, access to bank credit, profitability, or the extent to which investment was liquidity constrained. Although she did find that firms with bank representatives on their boards were significantly more likely to be listed on the exchange, she argues that this pattern was less likely a result of the efficiency of universal banking than of regulatory constraints on share values and paid-in capital that made it difficult for industrial corporations to raise equity capital on their own (Fohlin 1997b, 1998, 1999a and 1999b).

Studies of specific German industries, moreover, have found considerable heterogeneity in the extent to which even large firms made use of universal banks' services. Iron and steel firms were heavily dependent on banks during the difficult 1870s and 1880s. By the 1890s, however, they were in a position to finance investment largely out of retained earnings, and had begun systematically to reduce the extent of their ties to particular financial institutions. The role that banks played in the organization of electrical utilities is generally acknowledged, but it is thought that banks' presence was comparatively negligible in the country's flagship chemical industry (Pohl 1984; Feldenkirchen 1981 and 1991; Wengenroth 1994; Wellhöner and Wixforth 2003).

Although there is no denying that great banks lent money to and underwrote the securities issues of important industrial ventures, the number of firms that could take advantage of the banks' combination of investment commercial banking services was in fact quite small (Tilly 1986, 1989, and 1992). In 1905, nearly 2000 companies were listed on the various German exchanges. These companies constituted 36 percent of all joint-stock corporations (Fohlin 1999b, 328), but joint-stock companies themselves accounted for a relatively small portion of industrial investment in Germany—less than 20 percent of the total in the first decade of the twentieth century. Jeremy Edwards and Sheilagh Ogilvie estimate that this fraction was substantially less than (perhaps as little as a third of) the comparable British figure (Edwards and Ogilvie 1996, 436-37). As we will discuss below, most multi-owner German enterprises were organized as partnerships or private limited liability companies—that is, as enterprises that could not issue tradable securities. To the extent that universal banks provided any assistance to these firms, it was mainly by lending to them on current account—that is, through the types of short-

term commercial lending conventionally associated with Anglo-American banks (Collins 1998).

Indeed, recent research on the British financial system has demonstrated that the differences between British commercial banks and German universal banks have been greatly exaggerated. Although leading bankers in the two countries articulated very different notions of how banks should function in theory—where German bankers touted the value of providing a mix of commercial and investment services, British bankers promoted a focus on short-term commercial lending—there was an underlying similarity in practice. Not only did British banks hold proportions of non-governmental securities in their portfolios that were similar to those of German banks (Fohlin 1997a), but like their continental counterparts, British banks cultivated long-term relationships with their customers that enabled them to accumulate information about (and monitor) borrowers' businesses. Many of their customers were industrial firms, and British banks financed their activities in much the same way as German banks did, regularly renewing their short-term loans. In effect, they provided them with a long-term line of credit that could be increased or decreased in accordance with the bank's assessment of the firm's position (Collins 1998). British banks, moreover, also went through a consolidation process that resulted in a small number of large banks with extensive networks of branches and correspondent relationships with smaller banks. Indeed, the degree of concentration in British banking by the early twentieth century was approximately the same as that in Germany (Collins 1991; Capie and Collins 1992; Cottrell 1992). Although some scholars have argued that large British banks were less adventurous than the German great banks, the differences really only affected the large industrial enterprises served by these

institutions. In both countries, SMEs had for the most part to rely on more informal or local institutions for funds (Kennedy 1987; Best and Humphries 1998; Tilly 1986 and 1989; Pohl 1991; Pierenkemper 1994; Baten 2001a).

2.3. Demand-Side Constraints

That modern financial institutions have largely ignored SMEs is to some extent a result of the technology behind the production of financial services. Stock exchanges, universal banks, large-scale investment banks, and the specialized attorneys and other professionals they needed to function, all required a large market to form. These minimum scale constraints operated, first of all, at the level of the market. Both exchanges and universal banks faced high fixed start-up costs that could only be recouped if the volume of their business was large. In the case of exchanges, these costs included the expense of acquiring and maintaining a trading floor, of organizing the trade so that orders could be promptly and properly executed, and of collecting and disseminating information about prices. Banks also faced substantial organizational costs, in addition to the expenses associated with their buildings. Particularly important were the costs of constructing an administrative apparatus capable of managing the required knowledge capital and monitoring loan agents. Because exchanges required a large volume of trade to be cost effective and banks required a high value of loans, modern financial intermediaries located primarily in financial centers where these magnitudes were likely to be large enough to justify the necessary investments.

Scale constraints also operated at the level of the firms whose securities were traded or who borrowed money. Beyond the fixed cost involved in setting up these

financial institutions, there were costs associated with serving each client. Some of these varied with the size of the undertaking, but many did not. For instance, the cost of publicizing the daily price of an individual stock did not depend much on the volume of trade in that security. Similarly, a credit check on a particular business cost the same whether the loan was for 5,000 or 50,000 dollars. The fixed nature of these costs was in and of itself enough to induce modern financial intermediaries to prefer large over small clients. When one takes into account the higher costs typically involved in collecting information about SMEs, the bias was even more compelling.

If modern financial institutions tended to ignore SMEs located in financial centers, firms in outlying areas faced even greater difficulty securing capital from them. To avoid massive problems of adverse selection, such institutions would have to invest in technologies to screen local borrowers, but in small markets the benefits would not be worth the costs. In addition, as we shall see in Section 3.2, in many places there would be competition from local intermediaries that had better access to information from informal personal connections. In some countries, furthermore, there were institutional constraints that prevented financial-center banks from developing networks of branches. Throughout the nineteenth century, for example, U.S. banks could only operate in a single state, and in most states they were not allowed to branch (Calomiris 1995; Davis and Gallman 2001).

If modern financial intermediaries were unlikely to move into outlying markets, the SMEs located there were also unlikely to bear the cost of making themselves known to institutions in financial centers. The small amount of capital to be raised simply would not justify the legal fees, documentation expenses, and travel costs involved. Hence if

SMEs were to have access to finance, it was going to be through alternative institutions such as second-tier or local banks, credit cooperatives, or local informal intermediaries. Although credit constraints remained and may have been responsible for the high rates of failure that afflicted SMEs (Gömmel 1991), the North Atlantic core developed a remarkably diverse set of institutions over the course of the nineteenth century to meet the needs of small- and medium-size enterprises.

3. Financing SMEs

Like large firms, SMEs needed capital in the form of equity and long- and short-term debt. Although some entrepreneurs were wealthy enough to supply all own their financing needs, most had to seek out other sources of funds. Entrepreneurs' first resort, of course, was to those with whom they had close personal connections. They also attempted to mobilize existing social networks to secure funds. Over time, however, entrepreneurs' demand for capital stimulated the formation of new local financial institutions. Indeed, entrepreneurs themselves often played an important role in creating them.

The particular attributes of the financial systems that evolved in response to local entrepreneurial demand varied significantly from one region to the next, as a result, among other factors, of differences in initial conditions, in the operation of the political system, in the strength of opposing interest groups, and in the character of the overarching legal rules. As a result, the availability and relative attractiveness of equity versus debt finance and of long- versus short-term credit also varied considerably across locations. Because these different types of finance were to some extent some substitutes

for one another, this variation was of relatively little consequence for SMEs. Although there could be costs associated with the substitution of one form of finance for another, these problems seem to have been more significant for the financing of large-scale enterprises than for SMEs.

3.1. Equity Finance for SMEs

Entrepreneurs secured equity finance by inducing investors to take ownership stakes in their firms. However, the rights that accompanied these stakes varied according to the business's organization form. For this reason, the attractiveness of equity finance to both entrepreneurs and investors depended on the forms that were available to them and the legal rules that governed the forms. Everywhere throughout the North Atlantic core, for example, entrepreneurs could obtain additional investment capital by taking on partners, but because all members of a partnership had full ownership rights, such a step potentially resulted in a dangerous loss of control. The extent to which entrepreneurs could protect themselves in partnerships varied according to the legal system under which they operated. Under Anglo-American law, for example, partners could write contracts that limited the control rights of one or more members of the firm, but such agreements were not enforceable vis-à-vis third parties that had not been given specific notice of their terms. Under the French commercial code, by contrast, contracts of this type were fully enforceable so long as the salient details had been published in a newspaper of record. French entrepreneurs also had the option of securing equity finance through the device of a limited partnership (*commandite*)—that is, by acquiring partners who gave up all control rights in exchange for limited liability. This form was not available in England in

the nineteenth century, and in the U.S., was only available under rules that were so restrictive that relatively few were organized. In France, and elsewhere in Europe where French commercial law prevailed, the form was not only much used but extended so as to enable the limited partners' shares to be traded (Lamoreaux and Rosenthal 2004b). But regardless of whether the firms organized as ordinary or limited partnerships, and regardless of the degree of contractual flexibility the legal system allowed, SMEs faced the serious threat that disagreements among owners would force the untimely dissolution of the enterprise (Bodenhorn 2000b; Lamoreaux and Rosenthal 2004a). Hence, everywhere, partnerships could only form among individuals that had a certain amount of trust in each other. Trust could only come about if potential partners knew each other.

Because French law required that multi-owner firms organized under the commercial code register with a local tribunal of commerce, it is possible to track the sources of equity investments in partnerships. During the 1830s and 1840s, somewhere above a thousand new legal entities registered in Paris, of which more than a third were manufacturing firms and the rest largely in commercial services. As one might expect, a number of these firms were family partnerships, but most included partners not related by kin. However, the partners typically were connected in some other way. For example, they were quite likely to involve two or more individuals with the same occupation who were pooling their skills as well as their capital. They were equally likely to be individuals or firms with upstream or downstream connections. Thus we observe textile wholesalers investing in textile manufactures and textile manufacturers investing in wholesale operations. We also observe private bankers taking equity positions in medium-sized firms by becoming limited partners (Chassagne 1991, 282-9, 315-22).

During the third quarter of the nineteenth century, governments throughout the North Atlantic core passed legislation that made the corporate form available by registration. Previously, corporations could only be organized with the express permission of the government, which states had varied widely in their willingness to grant. Even after the passage of general incorporation laws, however, there was considerable geographic variation in the use of the device. Corporations were common in the Anglo-American world, especially in the United States. Businesses on the European continent adopted the form much less frequently, in part because the laws typically set minimum share values and capital requirements that made them less attractive to SMEs, but in part because alternative forms, such as the limited partnership, were available and businesses could contract around at least some of the problems associated with the partnership form.

In Germany in particular, the corporate form was designed to be taken up only by publicly listed firms. The government envisioned that enterprises that intended to remain private would continue to be organized as partnerships of one type or another. Yet the contracting problems associated with all of these partnership forms, in combination with the restrictive rules imposed on corporations, drove the government to provide entrepreneurs with an alternative form of organization—the private limited liability company (*Gesellschaft mit beschränkter Haftung* or GmbH)—after 1892. A hybrid between partnerships and corporations in which share capital was not tradable but all owners had limited liability, the GmbH quickly became the form of choice for medium-sized enterprises in Germany (Pohl 1991). Elsewhere in Europe, though the rules governing the corporate form were less restrictive and many more corporations were

organized, the demand for the private-company form was also huge. British businesses obtained a similar option (the private limited company) in 1907, and France followed with the *société à responsabilité limitée* (SARL) in 1925. In both countries large numbers of medium-sized companies immediately adopted the new form. The one big exception was the U.S., where effective legislation for private companies (LLPs and LLCs) was not passed until the end of the twentieth century, and where even then the take-up rate for the form was slow, presumably because there had been adjustments in the interim that made the corporate form more useful to SMEs (Lamoreaux and Rosenthal 2004b).

The important point to take from this discussion of organizational choices is that SMEs in Europe rarely adopted forms that permitted shares to be sold and traded on the market. Rather, they organized in ways that forced them to secure their equity investments by more informal means. Even in the U.S., where many SMEs took the corporate form, the situation was similar. The vast majority of corporations never sold their shares on the market, and the entrepreneurs who founded them raised investment capital mainly by means of personal connections. This generalization was true for the first industrial revolution. Hence the Boston merchants who founded the Waltham-Lowell type textile enterprises raised their capital almost exclusively from members of their immediate circle (Davis 1958; Gregory 1975; Dalzell 1987; Meyer 2003). And it was just as true for the second industrial revolution. When, for example, the Brush Electric Company, the pioneer arc-lighting enterprise, was organized with a capital of \$3,000,000 in 1880, its founders lined up investors by buttonholing their friends in the Cleveland business community (Lamoreaux, Levenstein, and Sokoloff 2004).

One important consequence of this reliance on personal connections was that individuals who were well known and well respected members of their communities were in a favored position to secure equity investment, especially if they had some capital of their own. The reasons for this advantage were obvious in the case of partnerships, where all parties faced unlimited liability, but such local knowledge was important for other forms of organization as well because disagreements among members of a firm could disrupt the business of the enterprise or even cause it to dissolve. In the case of corporations, moreover, shareholders who owned a majority of the enterprise's stock effectively had dictatorial power. Investors who purchased minority stakes thus faced the possibility that controlling shareholders would expropriate more than their fair share of the enterprise's profits. If they did not have the personal knowledge they needed to trust the other members of the enterprise, they would not put their money in the firm (Lamoreaux and Rosenthal 2004a).

3.2. Sources of Credit for SMEs

Entrepreneurs associated with SMEs also relied heavily on personal connections to secure loans, turning for credit to the same kinds of people from whom they sought infusions of equity—that is, family members, close business associates, or others with whom they had stable, long-term relationships. Because it was costly for lenders who had no direct experience with a borrower to secure the information they needed to judge his or her creditworthiness, arms'-length credit was difficult to obtain. The smaller the firm and the more recently it had been established, the more formidable the problem.

On the European continent, however, one important type of functionary was in a position to obtain the kinds of personal information needed to support credit decisions. Notaries' primary responsibility was to draw up contracts for private individuals. Because notaries were sworn officials, individuals who contested contracts that they drawn up bore a heavy burden of proof. Hence important contracts were notarized. This information could make notaries valuable intermediaries in asset markets because they knew who had idle wealth and who needed capital. Notaries also had access to information about individuals' past performance in asset transactions. Hence they could judge both a borrower's creditworthiness and a lender's willingness to bear risk. Indeed, by the eighteenth-century, Parisian notaries had transcended their simple duties as scribes to take on the role of asset brokers, using their information about clients to match borrowers and lenders. Among the innovations they quickly put in place was a system of referrals with other notaries that allowed them to increase the efficiency and scope of their brokerage business. In the past, individuals had largely transacted within the clientele of their own notary or with individuals they knew personally. By the 1740s, some two thirds of all transactions involved individuals from two different notaries' clienteles. In effect, borrowers could now be matched with lenders from anywhere in the city (Hoffman, Postel-Vinay, and Rosenthal 2000, ch. 6). The system broke down during the Revolution, but by the 1820s notaries were not only back in the brokerage business, they were helping to raise capital for industrial enterprises. Some of them chose to extend their reach beyond brokerage into full-fledged underwriting (Hoffman, Postel-Vinay, and Rosenthal 2003). The names of Parisian notaries appear on tombstone ads soliciting investors in industrial share commandites in the 1830s, alongside those of

bankers and brokers. Outside Paris, notaries assisted industrialization by facilitating loans. They adopted different practices in different regions, but wherever industrialization was taking hold, lending through their offices increased (Hoffman, Postel-Vinay, and Rosenthal 2004).

Much of what notaries did was not sanctioned by the law, but it was not forbidden. Their activities as financial intermediaries did take them far from their original function, and at times threatened the legitimacy of their position of public trust. Yet the state was loath to step in and prohibit these activities. In fact, it tolerated them for many decades—until an alternative financial system based on banks was already in place. As a result, notaries who strayed into banking went bankrupt in Paris and elsewhere with some regularity in the quarter century that followed the Bourbons' return to power. As the banking system developed, however, the state's tolerance declined. In Paris, not surprisingly, the end came sooner than elsewhere. The city already had more than 200 banks by the end of the 1830s, as well as an established securities market, and the bankruptcy of Jacques François Lehon demonstrated the extent of risks that the notaries' activities involved. Lehon was unusually well connected, being the brother of the Belgian ambassador, and having among his clients the Duc de Morny, the half brother of the future Napoleon III. He was a relay in the network of financiers that moved resources to and from Belgium. Further, he had a small number of extremely wealthy, but relatively inattentive clients who left vast sums on deposit with him. He used their capital to underwrite some twenty-four new share commandite firms in mining and manufacturing during the 1830s. Because he was underwriting, when firms failed to attract investors he was stuck with the stock. When a beet-sugar enterprise went sour, Lehon found himself

in serious difficulty. He then engaged in a series of even more risky activities in the hopes of bailing himself out. To fund those endeavors he drew up fraudulent contracts. Faced with an inability to meet a withdrawal request in 1843 he failed, and was arrested.³

After the Lehon debacle, the government threatened notaries with a great deal of regulation, including periodic audits of their books. To avoid such an intrusion into their affairs, Paris notaries agreed to exit all banking activities and to police themselves to make the agreement stick (Hoffman, Postel-Vinay, and Rosenthal 2003). In the countryside, notaries ignored the government's threats, and it was not until the 1890s that the state required notaries to remove themselves from finance. By then, however, the number of bank offices outside Paris had grown from about 800 in the 1830s to 2500 or so, and there were also more than a 1,000 savings bank branches.⁴

The history of notaries suggests that individuals with good information about other people's net capital demands can enter the financial system easily as long as the state does not prevent them from doing so. The state chose to restrict the activity of notaries only after alternative financial intermediaries had become available; until then it was willing to bear with some disorder in order not to forestall growth. As a consequence, in the French case, the arrival of banks had limited impact on growth, because even though banks may have been more efficient than traditional intermediaries, they did not come into a financial desert.

In Anglo-American countries, notaries did not play such an important role in the drafting of contracts and so did not have the same privileged access to information as their counterparts on the European continent. But there were other ways to harness local

³ The judicial proceedings against Lehon can be followed in the *Gazette des Tribunaux* from January of 1841 to June of 1842. See also Hoffman, Postel-Vinay, and Rosenthal (2003).

⁴ *Annuaire-Almanach Didot-Bottin*, various years.

information to facilitate the provision of credit to SMEs. By the middle of the nineteenth century, for example, credit reporting agencies had emerged in the United States to collect local information and sell it to businesses that needed to decide whether or not to extend trade credit (and how much) to firms in other parts of the country. The most successful such enterprise was the Mercantile Agency, predecessor of Dun and Bradstreet. The Mercantile Agency developed a network of correspondents in communities across the country who were paid to send the company regular reports on the standing of local businesses. Lawyers were especially well-placed to perform this function because a mainstay of their business during this period was the collection of unpaid debts. For firms that had not defaulted on any payments, correspondents reported what they could learn from interviews, newspapers, local records, and gossip about the wealth and character of the proprietors and the volume and profitability of their businesses. As in the case of notaries, the response of government to this innovation was generally permissive. State legislatures resisted pressure to make agencies liable for losses when their subscribers acted on misinformation, and the courts were similarly unwilling to make this business unprofitable. Although for a time there was some uncertainty about the conditions under which the courts would consider the dissemination of unfavorable information to be liable, the trend was to require only that credit report agencies be reasonably diligent (Madison 1974; Norris 1978; Olegario 2001; Balleisen 2001).

More generally, the marginal role played by notaries in the Anglo-American world increased the relative importance of local banks in the provision of credit to SMEs. In England, for example, during the early industrial period there was a dramatic

expansion in the founding of “country” banks, with the number increasing from 12 in 1750 to over 300 by 1800. These banks were typically small, private institutions, limited by law to no more than six partners. Many were formed by industrialists with the express purpose of providing financial support for their manufacturing enterprises. Most of this support came in the form of short-term credit, but banks in some areas also provided medium- and long-term loans. In 1825, new legislation permitted banks to organize as joint-stock companies, but those that adopted the new form seemed to have changed their structure more than their function. The prominent position that local manufacturers continued to occupy on their boards suggests that the banks continued to serve their interests (Cottrell 1980, 14-16; Collins 1991, 23-29; Newton 1997).

Nowhere was the connection between local banks and local industry more apparent than in New England, the region of the United States that industrialized most rapidly during the first half of the nineteenth century. Particularly in Massachusetts and Rhode Island, charters for banking corporations were easy to obtain, and many entrepreneurs organized banks in their communities with the aim of providing themselves with a source of credit. It was well known that the banks thus created lent the bulk of their funds to their own officers and directors, or to others associated with these personages in business, but these institutions nonetheless found it easy to attract investment funds from members of their surrounding communities. Although people with savings seem to have been reluctant to invest them directly in manufacturing enterprises, they eagerly bought (in the form of bank stock) what was in effect a share of the diversified investments of their community’s most active entrepreneurs. To protect and encourage this flow of funds, banks developed governance systems that enabled the

entrepreneurs that dominated them to cross monitor each other. Although each entrepreneur might, if unchecked, have succumbed to temptation to lend too much of the bank's funds to himself, each entrepreneur also had an interest in protecting this valuable source of credit and so could be counted on to intervene to prevent one of his colleagues from undermining the solvency of the institution. This system seems to have worked remarkably well, for bank failures were infrequent and capital flowed into the banking sector, giving the region one of the most favorable ratios of bank capital to population in the world (Lamoreaux 1994; Meissner 2003).

Of course, banks that lent their funds disproportionately to insiders discriminated against other would-be borrowers in their localities. In the New England case, however, political pressures forced state governments to lower barriers to entry into banking to such an extent that virtually any group of entrepreneurs who wanted to could organize a bank. This policy undoubtedly limited the extent of the distortion even if it could not completely eliminate it (Lamoreaux 1994). In other states, legislatures were less liberal in their chartering policies, but banks there seem to have made an effort to prevent such political pressures from mounting by extending credit to significant numbers of outsiders, many of them small, local manufacturers. In order to do this safely, they exploited local sources of information. When bank officers themselves did not know a borrower, they relied on the judgment of someone they trusted who did. For example, the records of the Bank of Newburgh, New York, contain letters from a prominent local businessman recommending that the bank extend credit to particular farmers and tradesmen (Wright 1999; Bodenhorn 2000a). By the middle of the nineteenth century, upstate New York banker Alexander Bryan Johnson was advising his colleagues to systemize their

collection of local information—to investigate assiduously the reputations of those who applied to them for credit and to keep detailed records of the financial tidbits they gleaned. Extant records from small banks in different regions of the country suggest that this kind of advice was being followed seriously (Johnson 1850; Wright 1999; White 2001).

Although one might regard this type of local banking as “fairer” than systems based on insider lending, it is not at all clear that it led to credit decisions that approximated those that would today result from the application of more objective lending criteria. Indeed, when prominent bankers and regulators began to promulgate the development of objective standards during the late nineteenth century, they emphasized the extent of the deviance. One country banker reported in *Bankers’ Magazine* an experiment in which he wrote down only such information about borrowers as he “positively knew, or could learn from unquestionable sources.” Reviewing his records, he discovered to his “astonishment” that he really knew very little, and that he and other bankers like him had been “granting credits on ‘general reputation’ unworthily” (Lamoreaux 1994, 102).

Whether or not this was the case, there is no doubt that allocation rules that depended on local knowledge resulted in extensive credit rationing. As in the case of equity finance, individuals with thick ties to other members of their community, and with some capital of their own, were in a much better position to secure credit than other borrowers, regardless of the quality of their projects. But there is also no doubt that as commercial banking became more professionalized and more regulated, lending practices changed in ways that were not always conducive to the finance of SMEs. To secure

long-term credit, for example, borrowers typically had to pledge collateral whose value was at least twice the amount of the loan (Snowden 1995; Hoffman, Postel-Vinay, and Rosenthal 2000). To secure short-term credit, they often had to maintain compensating balances in their deposit accounts, as well as to meet increasingly rigid quantitative standards of creditworthiness (Collins 1991, 39; Lamoreaux 1994).

Hence, as commercial banks grew into the modern financial institutions we discussed in Section 2.2, entrepreneurs began to organize new types of financial intermediaries that would better serve their needs. This process is especially apparent in the United States where the National Banking Acts of the 1860s transformed local banks that had served the needs of their community's businesses virtually overnight into more professional institutions with lending standards enforced by a national system of bank examiners (Lamoreaux 1994). To fill the resulting need for credit, local business people founded new state banks, savings institutions, building and loan associations, and trust companies. The latter were especially important because their charters enabled them to combine investment with commercial banking functions, while the laxer regulatory restrictions to which they were held enabled them to compete effectively with regular commercial banks for deposits (Barnett 1911; Neal 1971; White 1982 and 1983, ch.1; Snowden 1995 and 1997). During the late nineteenth and early twentieth century, for example, when Cleveland, Ohio, was a hotbed of start-up enterprises in electricity, chemicals, steel, automobiles, and other second-industrial-revolution technologies, local entrepreneurs founded a dozen trust companies, as well as scores of savings institutions and buildings and loans (Lamoreaux, Levenstein, and Sokoloff 2004).

Elsewhere throughout the North Atlantic Core, many similar institutions were formed. Some provided credit to small, local firms, but even where their direct contribution to such enterprises was limited, they made it easier for individuals to accumulate financial assets which could then be used to start business. For example, in Germany there was a tremendous expansion in savings banks (Sparkassen) during the late nineteenth century. In Prussia, the number of Sparkassen increased from 234 in 1850 to 1191 in 1880 to 1711 in 1910. Moreover, by 1910 there were 3072 savings banks in the country as a whole (Guinnane 2002, 84-85). For much of the period, government regulations inhibited the ability of Sparkassen to lend to local SMEs by limiting the kinds of assets in which savings banks could invest. Moreover, though Sparkassen were able to make loans to industrial firms by taking mortgages on real estate or, in Prussia, on the security of a second endorser, over time their investments gravitated toward urban mortgages and government securities. Indeed, governments deliberately chartered Sparkassen as a way of creating a market for their securities. As Timothy Guinnane has pointed out, however, much of the government debt that Sparkassen purchased was issued to finance infrastructural improvements that potentially benefited local businesses, for example, by lowering transportation costs (Guinnane 2002, 85-89). Although the Sparkassen had some unique features relative to other savings institutions in the North Atlantic core, they were part of a general movement to increase the size of the middle class by facilitating saving. The extent of government involvement and the kinds of restrictions on investment varied from one country to the next, but their goal everywhere was the same: to create a large pool of savings.

Another institution that emerged in Germany to provide loans to small businesses and farmers was the credit cooperative (Guinnane 2002; Herrigel 1996; Wengenroth 1999). There were several different movements to organize cooperatives during the nineteenth century, and the reformers who led these movements had somewhat different ideas about how these institutions should be organized. Nonetheless, all mobilized local information flows in essentially the same way—by inducing members who knew each other well to monitor each other's borrowing and enforce repayment terms. Cooperatives associated with the ideas of Freidrich Raiffeisen and Wilhelm Haas were primarily rural and saw their purpose to be the provision of long-term credit to farmers. Those associated with Hermann Schulze-Delitzsch tended to be located in urban areas and to lend short-term to small craftsmen and shopkeepers. Although rural cooperatives were by far more numerous, they also tended to be smaller. Although in 1910, there were 15,517 rural cooperatives compared to only 2,103 urban ones, the difference in the number of their members was not nearly so great. The former had about 2,563,000 members in 1910 compared to 1,056,000 for the latter (Guinnane 1997, 2001 and 2002; Ghatak and Guinnane 1999).

One problem that all of these local financial institutions had to face was their vulnerability to shocks that adversely affected economic activity in their area of operation. In Germany, credit cooperatives experimented with formal means of reducing this vulnerability. In 1864, the mostly urban cooperatives organized on the Schulze-Delitzsch model organized an umbrella bank (owned collectively by the cooperatives but also by outside investors) that could lend to cooperatives when needed. This bank only lasted until 1864, however, when it ran into financial difficulties and was sold off. The

rural cooperatives organized according to the Raiffeisen and Hass models also organized “centrals,” regional or national institutions whose members were the individual cooperatives. Centrals accepted deposits from member cooperatives, lent them money, gave them access to broader capital markets, and served as lenders of last resort. In 1895, the Prussian government chartered the Prussian Cooperative Central Bank (Preussenkasse) with capital supplied by the Prussian government to serve a similar function for all of the centrals within Prussia (Guinnane 1997 and 2002).

Throughout the North Atlantic Core, local banks and other local financial institutions attempted to improve their ability to withstand shocks by developing correspondent relationships with large urban banks. By placing funds on deposit with their urban correspondents, they could diversify their portfolios and secure access to credit in times of need. These arrangements never amounted to full insurance, however, because urban banks always exercised discretion about whether or not to provide additional resources to their client banks. Country banks often failed in England when money was tight, but nearly all paid their depositors in full when they were liquidated, suggesting that there would have been many fewer failures if the banks had been able to get through these periods of stringency. The rise of branch banking in England and elsewhere was in part an effort to solve this problem (Cottrell and Newton 1999). In Germany, another solution was for the large Berlin banks to acquire minority stakes in outlying institutions (Guinnane 2002). Many nations also created central banks that could serve as lenders of last resort for the largest banks in the system, enabling them in turn to perform their role of stabilizing smaller institutions better. But these

arrangements remained highly imperfect throughout our period, and general financial crises continued to cause large numbers of bank failures.

3.3. Substitutes, Complements, and Path Dependence

Although the different types of finance—equity, long-term credit, and short-term credit—were to some extent complements, they could also be substitutes for one another. Which type was easier to raise varied from location to location depending on factor endowments, the nature of the legal system, and the structure of government, but also on the particular solutions that local entrepreneurs developed to meet their needs. As a result, the evolution of financial institutions had a path dependent character, and there were persistent differences across countries, and even within countries, in the way SMEs raised funds.

In France, for example, one of the largest centers of textile production was the area in and around Lille. Most firms consisted either of sole proprietorships or family partnerships, which grew steadily over the course of the century without much recourse to outside equity (Hirsch 1991). Because families often accumulated large landholdings as part of their diversification strategies, however, they did have access to long-term loans. In the early nineteenth century, these loans were typically arranged by notaries, but over time banks increasingly provided this type of credit. Indeed, by the middle of the century, the North had one of the densest networks of banks, most of them private, in the country. These banks also provided short-term credit to local manufacturers. The banks were run by individuals with close personal links to the main industries of the area and, as a result, were quite well informed (Bonnin 2004; Lescure 1999).

This mix of long-term and short-term debt prevailed throughout most of France, but there were important exceptions. In the Seine river valley between Paris and Rouen and in Alsace, textile manufacturers raised capital by selling equity. Prior to the passage of a general incorporation law in 1867, they relied mainly on the commandite form; after 1867, they converted their firms to corporations when they needed to raise capital, often thereby moving up in the size distribution from medium-size enterprises to large ones (Levy-Leboyer 1964, Chassagne 1991). In Alsace, firms were able to raise capital in Basel, whereas firms in the Seine river valley were closely tied to the Paris capital market. In both cases, family and business relationships were important in securing such outside infusions of capital for the large firms. For smaller, more specialized firms, it was again local connections that mattered (Chassagne 1991, 378-88).

Paris was a more important exception. Although Parisian bankers sometimes took equity positions in medium-size firms by becoming silent partners, they rarely made long-term loans to manufacturers. The reason was simple: Parisian manufacturers generally lacked the necessary collateral. Unlike the countryside, where real estate was widely dispersed, Parisian landholding was extremely concentrated (Daumard 1973; Piketty, Postel-Vinay, and Rosenthal 2004). Nearly all the inhabitants of the city were renters, and most commercial and industrial enterprises leased their workspace. Although renting reduced manufacturers' access to long-term loans, it also reduced their fixed capital requirements. Manufacturers were also able in some industries to limit their need for fixed capital in other ways. For instance, Paris was a major producer of luxury commodities known as "articles de Paris." These goods were most often produced through a putting-out system, with artisans working alone or in small groups "en

chambre.” The artisans owned their own tools with the manufacturer supplying inputs and designs (Lemerrier 2003).

To meet manufacturers’ needs for working capital, Paris had an active short-term debt market. Though this market is less readily visible to historians because there was no legal requirement for borrowers and lenders to register commercial debt, there is abundant evidence of its existence in the records of the bankruptcy court. Moreover, concerns about controlling the magnitude of these kinds of liabilities pervade the governance agreements of new firms and, more generally, the whole business literature of the period. Much of this lending took the form of trade credit, where long-term business relationships kept informational problems to a minimum (Brennan 1997). But small investment banks also made short-term commercial loans in sectors where they invested in acquiring information.

As the French case demonstrates, even within a common political and legal system and even within a single industry, firms’ capital structure could vary considerably in ways that reflected the peculiarities of local history. Across countries with different types of political or legal systems, of course, the differences could be still more marked. But so long as firms had access to some form of finance, the particular type that was available seems not to have mattered all that much. Thus industrialization progressed rapidly in New England during the early nineteenth century, despite firms’ limited access to equity finance or long-term loans. The growing number of local banks made credit available to SMEs in the form of 60- or 90-day notes that could be rolled over for extended periods of time and thus effectively substitute for long-term capital (Lamoreaux 1994). The more capital-intensive firms that sprang up in the machine tool, electrical,

and automobile industries in the Midwest during the second industrial revolution thrived on similar short-term sources of funds. Indeed, their entrepreneurs were actively involved in founding local savings institutions and trust companies that would help them meet their financing needs in this way (Lamoreaux, Levenstein, and Sokoloff 2004).

The extent to which different types of financing can substitute for each other should not be overstated, however. The three main types are to some extent complements, because each is better suited to specific needs. Short-term debt can expand and contract flexibly with the demand for working capital and so helps firms minimize their financing costs. Long-term debt and equity, on the other hand, are more suitable for fixed-capital investments, the returns from which can only be realized over significant periods of time. Similarly, equity finance has implications for control rights that loans do not have. On the other hand, missing interest payments can have much greater consequences for the survival of the firm than passing dividends.

SMEs tended to have relatively high burdens of (especially short-term) debt because in most places that was the easiest type of finance for them to secure. Leverage (and along with it, investment) tended to increase during boom periods, but that meant there was also likely to be an increase in insolvencies during the downturns that inevitably ensued (Neal 1994). The inefficiencies associated with this relatively high level of leverage were clearly large, but despite these high costs industrialization proceeded. In fact, it may well be that the uncertainties of the capital market promoted a high degree of creative destruction (Baten 2001b; Balleisen 2001).

To the extent there were negative consequences of having one type of financial system versus another, these seem to have been more likely to affect large firms rather

than SMEs. According to Charles Calomiris, legal impediments to branch banking kept financial institutions in the United States too small to meet the needs of the large-scale enterprises that emerged around the turn of the twentieth century (Calomiris 1995). Similarly, Lance Davis has argued that problems in obtaining bank finance forced firms to merge with their competitors in order to grow large enough to capture available economies of scale (Davis 1966). On the other hand, William Doyle has concluded, based on detailed research on the sugar and meat-packing industries, that large firms had no difficulty financing investment out of retained earnings and short-term sources of funds. They had to turn to the equity markets when they organized mergers because bargaining problems made it difficult to fund the necessary acquisitions in any other way. But after the mergers were completed, they reverted to traditional means of financing working capital and even investment (Doyle 1991 and 2000).

We do not wish to minimize the problems that SMEs faced in raising capital. There were always problems of discrimination that resulted from the informal nature of local credit markets. Moreover, the greater ease with which SMEs could obtain external funds in the form of credit rather than equity increased their leverage and hence their vulnerability to shocks—a danger that the localized nature of the institutions that served them tended to exacerbate. Nonetheless, our reading of the historical record leads us to emphasize the positive: the alacrity with which, in this generally permissive regulatory environment, financial intermediaries emerged to serve SMEs wherever there was sufficient local demand; and the high degree of creativity that the entrepreneurs who founded these intermediaries exhibited as they innovated around such regulatory barriers

as existed, built on preexisting institutional structures, and responded to local factor endowments and other special conditions.

4. Financial Deserts

So far our argument that the development of financial institutions was largely demand driven has been based on an examination of success stories. Even in Western Europe and North America, however, there were places that could be characterized as economic deserts. Instead of accumulating or attracting capital, these regions exported labor. They also generally suffered from a lack of financial intermediation, raising the question of whether government policy was to blame. In this section, we consider whether restrictive chartering or regulatory policies might have inhibited the development of financial services in these regions. We again find that differences in demand explain much of the regional heterogeneity in financial activity.

We proceed by examining one such financial desert, the area of Central France that includes the départements of Aveyron, Cantal, Coreze, Lot, Lozere (henceforth and by exaggeration the Massif Central). This region lacked natural endowments, was located far from markets, and had a population that was not particularly well educated. Low tax payments and the short height of the region's conscripts suggest that the area was poor in the 1840s, and the area remained far below average according to a number of development indicators at the end of the century. Although there was some manufacturing on the fringes of the region (most famously Porcelain in Limoges and Michelin tires in Clermont Ferrand), as late as 1898 only 22,000 of its people worked in manufacturing. Relative to population, that was a quarter of the French average. There

was also significant out migration. Although the French population grew by 16 percent from 1840 to 1900, these départements lost more than 4 percent of their population over the same period.

It is possible to measure the diffusion of various kinds of financial intermediaries in this area compared to the rest of France. The oldest such institutions were private commercial banks, set up as sole proprietorships or partnerships of one form or another.⁵ During the period 1820 to 1850, there was a massive increase in private banks throughout the country, but in the Massif Central they were much slower to form than elsewhere in France. On a per capita basis there were half as many private banks in this region in 1829 as in the country as a whole (see Table 3). Over the rest of the century the gap closed, so that by 1898 there were roughly as many bank offices per capita in the Massif Central as elsewhere. But because the rate of population growth was much slower in this region, the growth in the number of bank offices was actually quite slow. Banks in the Massif Central banks were also quite small relative to the national average. Because these were private banks, they had no reporting requirements. Nevertheless we can get a measure of their activity by looking at the amount of their discounts at Banque de France offices in the region at the end of the century.⁶ Local discounts windows of the Banque de France largely served private bankers; the nation's large corporate banks did not use the Banque's branch offices. In the Massif Central, the Banque de France's discounts per capita were only 28 percent of the non-Paris national average. It thus seems that the region's low level of private banking stemmed from a low level of demand.

⁵ Bank offices are enumerated in the *Annuaire Almanach des 500,000 adresses*, various years.

⁶ *Annuaire Statistique de la France* (Paris: Imprimerie Nationale, 1898).

During the 1870s France's five big modern banks began to open offices throughout the country. The Banque de France and the Crédit Foncier were government controlled but mostly privately owned; the Crédit Lyonnais, Comptoir National d'Escompte de Paris, and Société Générale were private. As Table 3 shows, there were only two thirds as many branches of these large banks in the Massif Central as in the rest of the country. Moreover, because they were required by law to have at least one branch per département, the Banque de France and the Crédit Foncier accounted for ten of the sixteen branches in the region,. Private branch banks did ultimately move into these areas, but only much later, when they had fully diffused in the higher demand areas. As noted above, the Banque de France did little business in the Massif Central and that was true for the Crédit Foncier as well.⁷ Just opening a branch was not sufficient to create a demand for its services. Furthermore, the state required every canton (of which there are two dozen or so in each département) to have at least one branch of a savings bank (caisse d'épargne). As a result, there were as many caisses in the Massif Central as elsewhere on a per capita basis. But the branches held far fewer accounts.

These kinds of regulations probably increased access to finance in the Massif Central somewhat, but on the whole the French government left finance to the private sector. Major initiatives like the expansion of branches by the Banque de France, the Crédit Foncier, or the Caisses d'épargnes did not involve any significant commitment of public resources and, on the whole, had a greater effect on the ability of individuals to save than on easing the credit constraints faced by entrepreneurs. In areas that were far from large markets, there was little demand for financial services, and as a result, banks spread more slowly and remained smaller than elsewhere. On the other hand,

⁷ Ibid.

government regulation was sufficiently light that it did not inhibit entry into financial services, even in these remote areas with weak demand.

One could find other such financial deserts in the North Atlantic core. They existed, not because governments resisted the spread of the banking system or of other financial intermediaries, but because there was little demand for financial services in these areas. Beyond the North Atlantic core, however, the story seems different. Government involvement was much more important. Either the state took the initiative and, in Gerschenkronian fashion, organized the financial sector as industrialization began, or it limited the extent to which financial development could occur because it wanted to control the flow of investment.

The Latin American experience is instructive in this regard. As in the North Atlantic core, demand side factors affected industrial and financial development. During the last two decades of the nineteenth century, Haber (2003) argues, depreciation in the real exchange rates of many Latin American countries that were on a silver standard provided the impetus for export-led industrial development. The implicit trade protection afforded by depreciating exchange rates made it worthwhile to create railway networks that integrated markets, much of which was financed by foreign investment. In turn, local demand for consumer goods was further stimulated by the new wage earners associated with the export business.

All of these demand side factors were conducive to the development of manufacturing. However, reliance on the implicit trade protection afforded by exchange rates gave way to successful lobbying by large manufacturers for explicit protection. Haber argues that this equilibrium was sustainable because politicians were not

accountable to consumers, who bore the cost of protectionism but were not sufficiently politically organized to do anything about it.

Another consequence of this lobbying was limitations on entry into the financial sector, which effectively limited the sources of available funds to a small number of banks whose boards of directors often overlapped with those of the large, mechanized firms that had come to dominate product markets. Competition in product markets was therefore stifled because only a limited number of entrepreneurs had access to finance. Thus the size of firms was directly related to distortions imposed on financial markets by the state. In short, the politics of industrialization were inimical to SMEs and to the development of financial institutions that would have assisted them.

Contrast this with the situation described above for early New England, where the political calculus tipped in favor of free entry into banking, or in states with less liberal chartering policies, where there was the tendency to head off political pressures by limiting the extent of insider lending. Although an in-depth analysis is beyond the scope of this paper, the Latin American experience suggests that not all developing countries have a bimodal distribution of very large and very small firms because they are financial deserts. Rather, political considerations and the resulting government interference often prevented the financial system from supplying capital to prospective entrants.

5. Conclusion

As we have argued above, in the North Atlantic core SMEs had access to finance primarily through local financial institutions that relied heavily on informal means to acquire information and allocate credit. These local institutions had two important weaknesses. They discriminated among potential entrepreneurs on the basis of a variety

of criteria that often were only weakly related to the expected return of the project. Moreover, they were poorly diversified from a geographic or sectoral view point, and as a result, faced serious difficulties withstanding crises. Nevertheless, these institutions also had a number of strengths. In the first place, the capital markets in which they operated were basically competitive—because of easy entry into financial intermediation and rivalry among neighboring localities—and this competitiveness offset part of the discrimination outlined above. Second, these local financial institutions had the capacity to tap into sources of information that large-scale, “modern,” financial institutions found it too costly to exploit.

The financial institutions that served SMEs were local in their geographical scope, often serving areas measured in tens of square miles, but they were also local in their organization. Indeed, the most striking feature of these institutions may well have been the diversity of the forms they took. Although some kinds of intermediaries, for example commercial banks, were ubiquitous, even these might take different forms in different regions—in some places corporations, in some places partnerships of diverse types, in some places sole proprietorships. Other institutions had much more limited diffusion; the credit cooperative, for instance, did not catch on much west of the Rhine.

Governments in the North Atlantic core invested very few resources in private capital markets, but the ways in which they set up the basic institutional framework affected these markets in path dependent ways. Typically, each framework had both advantages and offsetting disadvantages that stemmed from a common source. For example, the political pressures that led to easy entry into banking in the American Northeast also led to restrictions on branch banking. Within each of these different

environments, however, it was left primarily to private individuals to solve the financing needs of manufacturing firms in general and SMEs in particular. Hence the important role that demand has played in our analysis is not too surprising.

As we saw in the introduction, recent data collected by the World Bank suggests that SMEs in developing economies today, like those in the North Atlantic core during the nineteenth century, have recourse to a variety of different sources of finance (see Table 1). If we break the ICS survey data down by firm size, rather than country of origin, we observe the classic pattern that reliance on banks and other kinds of formal intermediaries increases with the size of firms, whereas dependence on informal sources of funds decreases with size (see Table 4). As was the case in the nineteenth century, the issuance of equity is not important *at any size* in raising capital for new investment. If we break the data down by organizational form (see Table 5), adoption of the corporate form does not make it more likely that firms will issue equity. In other words, even today SMEs simply do not use equity markets to raise funds, but rather, like their nineteenth-century counterparts, secure external finance mainly through some form of credit. The considerable heterogeneity in financing methods that all these tables reveal suggests that governments should take care not to destroy the indigenous solutions that arise to SMEs' financing problems. Both history and contemporary evidence favor policies that foster a diverse set of financial institutions rather than impose a single type of intermediary.

As we also discussed in the introduction, most developing economies today have relatively fewer SMEs and relatively more very large firms than did the economies of the North Atlantic core when they were industrializing. Our historical research leads us to speculate that at least some of the difference results from the particular industrial

histories of today's LDCs. In many of these countries, industrial policy prior to the 1980s was focused around firms that were often very large (in terms of their domestic market share). These large firms were usually vertically integrated and had little need for upstream or downstream markets. Hence many LDCs reversed the chronology of the North Atlantic core. Instead of developing large firms after developing their markets, LDCs are developing their markets after growing very large firms.

Unfortunately, a manufacturing sector dominated by very large firms performs few SMEs. As a result, there is little economic demand for privately provided credit to SMEs, and little political demand for governments to allow private innovation in finance.

Even in the absence of such a political-economy equilibrium (and there are countries in Asia where small firms are abundant), the relatively high level of financial regulation that prevails today inevitably dampens creativity. To the extent that governments have made either implicit or explicit commitments to insure the financial sector, they have to worry about moral hazard, and the only way to reduce that risk is to require banks to have relatively standardized loan procedures—something that will prevent any regional heterogeneity in financial institutions from developing. The sink or swim attitude of the nineteenth century did lead to crises, but it fostered innovation at the same time.

Globalization, in the context of imperfect markets, is yet another problem for SMEs. To the extent that SMEs must compete in the global marketplace, they become very dependent on the markets that supply them and provide complementary goods and services. If these are poorly developed, vertical integration is a sensible solution, but one that advantages large- not medium-size firms. Globalization may also reduce the supply

of finance to SMEs. Indeed, rich individuals may well prefer to hold their wealth in a diversified financial portfolio abroad rather than invest it locally. Such outflows of capital might not hurt large firms who can afford to list in international markets but they will assuredly hurt SMEs who cannot.

Finally, the failure of many governments to commit to basic financial property rights creates severe problems for SMEs. In the first place, SMEs are more vulnerable to expropriation precisely because they are so rooted in the local economy. The more successful they are, the more attractive targets they become, and the more risk lenders bear as a result. Second, in countries where property rights are not respected, any person or institution with financial resources has an incentive to invest them abroad. But, of course, doing so reduces the amount of loans they can make to local firms (and thus to SMEs). In short, policies that enhance the security of property rights, as well as encourage entry by a diverse set of intermediaries, probably dominate any specific set of policies targeting credit to SMEs.

References

- Atack, Jeremy. 1986. "Firm Size and Industrial Structure in the United States During the Nineteenth Century." *Journal of Economic History*, 46 (June): 463-75.
- Atack, Jeremy. 1987. "Economies of Scale and Efficiency Gains in the Rise of the Factory in America, 1820-1900." In *Quantity and Quiddity: Essays in U.S. Economic History*, ed. Peter Kilby. Middletown, Conn.: Wesleyan University Press. Pp. 286-335.
- Balleisen, Edward J. 2001. *Navigating Failure: Bankruptcy and Commercial Society in Antebellum America*. Chapel Hill: University of North Carolina Press.

- Barnett, George E. 1911. *State Banks and Trust Companies Since the Passage of the National-Bank Act*. Washington, D.C.: Government Printing Office.
- Baten, J. 2001a. "Expansion und Überleben von Unternehmen in der 'Ersten Phase der Globalisierung.'" Tübinger Diskussionsbeitrag 215.
- Baten, J. 2001b. "Produktivitätsvorteil in kleinen und mittelgroßen Industrieunternehmen, Sicherheit in Großunternehmen? Die Gesamtfaktorproduktivität um 1900." Tübinger Diskussionsbeitrag 217.
- Benston, George J. 1994. "Universal Banking." *Journal of Economic Perspectives*, 8 (Summer): 121-43.
- Best, Michael H., and Jane Humphries. 1986. "The City and Industrial Decline." In *The Decline of the British Economy*, ed. Bernard Elbaum and William Lazonick. Oxford: Clarendon Press. Pp. 223-39.
- Bodenhorn, Howard. 2000a. *A History of Banking in Antebellum America. Financial Markets and Economic Development in an Era of Nation-Building*. New York: Cambridge University Press.
- Bodenhorn, Howard. 2000b. "To Partner or Not to Partner: Organizational Choice in the Old South." Unpublished paper.
- Bonnin, Hubert, 2004. *Histoire de Banques; Crédit du Nord, 1848-2003*. Paris : édition Hervas.
- Brennan, Thomas. 1997. *Burgundy to Champagne: The Wine Trade in Early Modern France*. Baltimore : Johns Hopkins University Press.
- Calomiris, Charles W. 1995. "The Costs of Rejecting Universal Banking: American Finance in the German Mirror, 1870-1914." In *Coordination and Information: Historical Perspectives on the Organization of Enterprise*, ed. Naomi R. Lamoreaux and Daniel M. G. Raff. Chicago: University of Chicago Press. Pp. 257-315.
- Calomiris, Charles W., and Daniel M. G. Raff. 1995. "The Evolution of Market Structure, Information, and Spreads in American Investment Banking." In *Anglo-American Financial Systems: Institutions and Markets in the Twentieth Century*, ed. Michael D. Bordo and Richard Sylla. New York: Irwin.
- Cameron, Rondo E. 1956. "Founding the Bank of Darmstadt." *Explorations in Entrepreneurial History*, 8 (February): 113-30.
- Cameron, Rondo. 1965. *France and the Economic Development of Europe, 1800-1914: Conquests of Peace and Seeds of War*. 2nd edn. rev.; Chicago: Rand McNally.

- Capie, Forrest, and Michael Collins. 1992. *Have the Banks Failed British Industry? An Historical Survey of Bank/Industry Relations in Britain, 1870-1990*. London: Institute of Economic Affairs.
- Cayez, Pierre, 1978. *Métiers jacquards et hauts fournaux; aux origines de l'industrie lyonnaise*. Lyon: Presse Universitaire de Lyon
- Chandler, Alfred D., Jr. 1977. *The Visible Hand: The Managerial Revolution in American Business*. Cambridge: Harvard University Press.
- Chassagne, Serge. 1991. *Le coton et ses patrons; France, 1760-1840*. Paris: Editions de l'Ecole des Hautes Etudes en Sciences Sociales.
- Collins, Michael. 1991. *Banks and Industrial Finance in Britain, 1800-1939*. Houndmills, Basingstoke, Hampshire: Macmillan.
- Collins, Michael. 1998. "English Bank Development within a European Context, 1870-1939." *Economic History Review*, 51 (February): 1-24.
- Cottrell, P. L. 1980. *Industrial Finance, 1830-1914*. London: Methuen.
- Cottrell, P. L. 1992. "The Domestic Commercial Banks and the City of London, 1870-1939." In *Finance and Financiers in European History, 1880-1960*, ed. Youssef Cassis. Cambridge: Cambridge University Press. Pp. 39-62.
- Cottrell, Philip, and Lucy Newton. 1999. "Banking Liberalization in England and Wales, 1826-1844." In *The State, the Financial System, and Economic Modernization*, eds. Richard Sylla, Richard Tilly, and Gabriel Tortella. Cambridge: Cambridge University Press, 1999. Pp. 75-117.
- Dalzell, Robert F., Jr. 1987. *Enterprising Elite: The Boston Associates and the World They Made*. Cambridge: Harvard University Press.
- Da Rin, Marco. 1996. "Understanding the Development of the German Kreditbanken, 1850-1914: An Approach from the Economics of Information." *Financial History Review*, 3: 29-47.
- Daumard, Adeline. 1973. *Les fortunes francaises au XIXe siecle*. Paris: Mouton.
- Davis, Lance Edwin. 1958. "Stock Ownership in the Early New England Textile Industry." *Business History Review*, 32 (Summer): 204-22.
- Davis, Lance E. 1966. "The Capital Markets and Industrial Concentration: The U.S. and the U.K., A Comparative Study." *Economic History Review*, 19 (August): 255-72.

- Davis, Lance, and Robert Cull. 1994. *International Capital Markets and American Economic Growth*. Cambridge: Cambridge University Press.
- Davis, Lance, and Robert Gallman. 2001. *Evolving Financial Markets and International Capital Flows: Britain, the Americas, and Australia, 1870-1914*. New York: Cambridge University Press.
- Davis, Lance, and Robert Huttenback. 1986. *Mammon and the Pursuit of Empire: The Political Economy of British Imperialism, 1860-1912*. New York: Cambridge University Press.
- Davis, Lance, and Larry Neal. 1998. "Micro Rules and Macro Outcomes: The Impact of the Structure of Organizational Rules on the Efficiency of Security Exchanges: London, New York, and Paris 1800-1914." *American Economic Review*, 87 (May): pp 40-45.
- Dickson, P.G.M. 1967. *The Financial Revolution in England : a study in the development of public credit, 1688-1756*. London: St Martin's Press.
- Doyle, William Michael. 1991. "The Evolution of Financial Practices and Financial Structures Among American Manufacturers, 1875-1905: Case Studies of the Sugar Refining and Meat Packing Industries." Unpublished Ph.D. Dissertation, University of Tennessee.
- Doyle, William M. 2000. "Capital Structure and the Financial Development of the U.S. Sugar-Refining Industry, 1875-1905." *Journal of Economic History*, 60 (March): 190-215.
- Edwards, Jeremy, and Sheilagh Ogilvie. 1996. "Universal Banks and German Industrialization: A Reappraisal." *Economic History Review*, 49 (August): 427-46.
- Enright, Michael J. 1995. "Organization and Coordination in Geographically Concentrated Industries." In *Coordination and Information: Historical Perspectives on the Organization of Enterprise*, ed. Naomi R. Lamoreaux and Daniel M. G. Raff. Chicago: University of Chicago Press. Pp. 103-42.
- Feldenkirchen, Wilfried. 1981. "The Banks and the Steel Industry in the Ruhr: Developments in Relations from 1873 to 1914." *German Yearbook on Business History*, 1981: 27-51.
- Feldenkirchen, Wilfried. 1991. "Banking and Economic Growth: Banks and Industry in Germany in the Nineteenth Century and their Changing Relationship during Industrialization." In *German Industry and German Industrialisation: Essays in*

- German Economic and Business History in the Nineteenth and Twentieth Centuries*, ed. W. R. Lee. London: Routledge. Pp. 116-43.
- Fohlin, Caroline. 1997a. "Banks Securities Holdings and Industrial Finance before World War I: Britain and Germany Compared." *Business and Economic History*, 26 (Winter 1997): 463-75.
- Fohlin, Caroline. 1997b. "Universal Banking Networks in Pre-War Germany: New Evidence from Company Financial Data." *Research in Economics*, 51 (1997): 201-25.
- Fohlin, Caroline. 1998. "Relationship Banking, Liquidity, and Investment in German Industrialization." *Journal of Finance*, 53 (October): 1737-58.
- Fohlin, Caroline. 1999a. "The Rise of Interlocking Directorates in Imperial Germany." *Economic History Review*, 52 (May): 307-33.
- Fohlin, Caroline. 1999b. "Universal Banking in Pre-World War I Germany: Model or Myth?" *Explorations in Economic History*, 36 (October): 305-43.
- Franks, Julian, Colin Mayer, and Stefano Rossi. 2003. "Spending Less Time with the Family: The Decline of Family Ownership in the UK." Unpublished paper.
- Gelderblom, Oscar, and Joost Jonkers. 2004. "Completing a Financial Revolution, the Finance of the East India Trade and the Rise of the Amsterdam Capital Market 1595-1612." *Forthcoming Journal of Economic History*, September.
- Gerschenkron, Alexander. 1962. *Economic Backwardness in Historical Perspective*. Cambridge, Mass. Harvard University Press.
- Ghatak, Maitreesh, and Timothy W. Guinnane. 1999. "The Economics of Lending with Joint Liability: Theory and Practice." *Journal of Development Economics*, 60: 195-228.
- Gömmel, R. 1991. "Überlebenschancen von Unternehmungsgründungen 1800-1870." *Zeitschrift für Unternehmensgeschichte*, 63: 17-28.
- Gregory, Frances W. 1975. *Nathan Appleton: Merchant and Entrepreneur, 1779-1861*. Charlottesville: University Press of Virginia.
- Guinnane, Timothy W. 1997. "Regional Organizations in the German Cooperative Banking System in the Late 19th Century." *Research in Economics*, 51: 251-74.

- Guinnane, Timothy W. 2001. "Cooperatives as Information Machines: German Rural Credit Cooperatives, 1883-1914." *Journal of Economic History*, 61 (June): 366-89.
- Guinnane, Timothy W. 2002. "Delegated Monitors, Large and Small: Germany's Banking System, 1800-1914." *Journal of Economic Literature*, 40 (March): 73-124.
- Haber, Stephen. 2003. "It Wasn't All Prebisch's Fault: The Political Economy of Latin American Industrialization." In *The Cambridge Economic History of Latin American History*, ed. Victor Bulmer Thomas. New York: Cambridge University Press, forthcoming.
- Harris, Ron. 2000. *Industrializing English Law: Entrepreneurship and Business Organization, 1720-1844*. Cambridge: Cambridge University Press.
- Hautcoeur, Pierre-Cyrille. 1994. *Le Marché Boursier et le Financement des Entreprises Françaises (1890-1939)*. Doctoral dissertation, Paris 1, Paris.
- Herrigel, Gary. 1996. *Industrial Constructions: The Sources of German Industrial Power*. New York: Cambridge University Press.
- Hirsch, Jean-Pierre. 1991. *Les deux rêves du commerce ; Entreprise et institution dans la région Lilloise (1780-1860)*. Paris: Editions de l'Ecole des Hautes Etudes en Sciences Sociales.
- Hoffman, Philip, Gilles Postel-Vinay, and Jean-Laurent Rosenthal. 2000. *Priceless Markets: The Political Economy of Credit in Paris, 1662-1869*. University of Chicago Press.
- Hoffman, Philip, Gilles Postel-Vinay, and Jean-Laurent Rosenthal. 2003. "No Exit: Notarial Bankruptcies and the Evolution of Financial Intermediation in Nineteenth Century Paris." In *Finance, Intermediaries, and Economic Development*, ed. Stanley Engerman, et al. New York: Cambridge University Press. Pp. 75-108.
- Hoffman, Philip, Gilles Postel-Vinay, and Jean-Laurent Rosenthal. 2004. "Révolution et évolution: Les marchés de crédit notarié en France 1780-1840." *Annales ESC*, 59 (March-April): 387-424.
- Johnson, Alexander Bryan. 1850. *A Treatise on Banking: The Duties of a Banker, and His Personal Requisites Therefore*. Utica, N.Y.: R. Northway & Co.
- Kennedy, William P. 1987. *Industrial Structure, Capital Markets and the Origins of British Economic Decline*. Cambridge: Cambridge University Press.

- Kinghorn, Janice Rye, and John Vincent Nye. 1996. "The Scale of Production in Western Economic Development: A Comparison of Official Industry Statistics in the United States, Britain, France, and Germany, 1905-1913." *Journal of Economic History*, 56 (March): 90-112.
- Lamoreaux, Naomi R. 1985. *The Great Merger Movement in American Business, 1895-1904*. New York: Cambridge University Press.
- Lamoreaux, Naomi R. 1994. *Insider Lending: Banks, Personal Connections, and Economic Development in Industrial New England*. New York: Cambridge University Press.
- Lamoreaux, Naomi R., Margaret Levenstein, and Kenneth L. Sokoloff. 2004. "Financing Invention during the Second Industrial Revolution: Cleveland, Ohio, 1870-1920." Unpublished paper.
- Lamoreaux, Naomi R., Daniel M. G. Raff, and Peter Temin. 2003. "Beyond Markets and Hierarchies: Toward a New Synthesis of American Business History." *American Historical Review*, 108 (April): 404-33.
- Lamoreaux, Naomi R., and Jean-Laurent Rosenthal. 2004a. "Corporate Governance and the Plight of Minority Shareholders in the United States before the Great Depression." Unpublished paper.
- Lamoreaux, Naomi R., and Jean-Laurent Rosenthal. 2004b. "Legal Regime and Business's Organizational Choice: A Comparison of France and the United States during the Mid-Nineteenth Century." NBER Working Paper 10288.
- Lamoreaux, Naomi R., and Kenneth L. Sokoloff. 2000. "The Geography of Invention in the American Glass Industry, 1870-1925." *Journal of Economic History*, 60 (September): 700-29.
- Lemercier, Claire. 2003. *Un si discret pouvoir ; Aux origines de la chambre de commerce de Paris, 1803-1853*. Paris: Editions de la decouverte.
- Lescure, Michel. 1999. "Small- and Medium-Size Industrial Enterprises in France, 1900-1975." In *Small Firms, Large Concerns: The Development of Small Business in Comparative Perspective*, ed. Konosuke Odaka and Minoru Sawai. Oxford: Oxford University Press. Pp. 140-67.
- Lévy-Leboyer, Maurice. 1964. *Les Banques européennes et l'industrialisation internationale dans la première moitié du XIX^e Siècle*. Paris: Presses Universitaires de France.

- Madison, James H. 1978. "The Evolution of Commercial Credit Reporting Agencies in Nineteenth-Century America." *Business History Review*, 48 (Summer): 164-86.
- Martin, Joseph G. 1898. *A Century of Finance: Martin's History of the Boston Stock and Money Markets*. Boston: privately printed.
- Meissner, Christopher M. 2003. "Committee Structure and the Success of Connected Lending in Nineteenth Century New England Banks." NBER Working Paper 9792.
- Meyer, David R. 2003. *The Roots of American Industrialization*. Baltimore: Johns Hopkins University Press.
- Mitchie, Ranald. 1999. *The London Stock Exchange: A History*. Oxford: Oxford University Press.
- Neal, Larry. 1971. "Trust Companies and Financial Innovation, 1897-1914." *Business History Review*, 45 (Spring): 35-51.
- Neal, Larry. 1994. "The Finance of Business during the Industrial Revolution." *The Economic history of Britain since 1700. Vol I. eds R Floud and D. McCloskey*. Cambridge: Cambridge UP, pp 151-181.
- Newton, Lucy. "Domestic Institutional Change: Regional English Joint-Stock Banking, 1826-1880." Unpublished paper, 1997.
- Norris, James D. 1978. *R. D. Dun & Co. 1841-1900: The Development of Credit-Reporting in the Nineteenth Century*. Westport, Conn.: Greenwood Press.
- Olegario, Rowena. 2001. "Institutions and Markets: U.S. Credit Reporting in Historical Perspective." Unpublished paper.
- Pierenkemper, T. 1994. *Gewerbe und Industrie im 19. und 20. Jahrhundert*. München: R. Oldernbourg Verlag.
- Piketty, Thomas, Gilles Postel-Vinay, and Jean-Laurent Rosenthal. 2004. "Wealth Concentration in a Developing Economy: Paris and France, 1807-1994." Unpublished paper.
- Plache, Lacey. 1999. "Financial Institutions, Government Policy and Industrialization: The Development of the French Stock Market, 1852-1875." Unpublished Ph.D. Dissertation, University of California, Los Angeles.
- Pohl, Hans. 1982. "On the History of Organization and Management in Large German Enterprises Since the Nineteenth Century." *German Yearbook on Business History*, 1982: 91-122.

- Pohl, Hans. 1984. "Forms and Phases of Industry Finance up to the Second World War." *German Yearbook on Business History*, 1984: 75-94.
- Pohl, M. 1991. "Überlebenshanden fon Unternehmungsgründungen 1870 bis 1918." *Zeitschrift für Unternehmensgeschichte*, 63: 29-47.
- Riesser, J. 1911. *The German Great Banks and Their Concentration*. Washington, D.C.: Government Printing Office.
- Sabel, Charles F., and Jonathan Zeitlin, eds. 1997. *World of Possibilities: Flexibility and Mass Production in Western Industrialization*. Cambridge: Cambridge University Press.
- Scranton, Philip. 1983. *Proprietary Capitalism: The Textile Manufacture at Philadelphia, 1800-1885*. New York: Cambridge University Press.
- Scranton, Philip. 1989. *Figured Tapestry: Production, Markets, and Power in Philadelphia, 1800-1885*. New York: Cambridge University Press.
- Scranton, Philip. 1998. *Endless Novelty: Specialty Production and American Industrialization, 1865-1925*. Princeton: Princeton University Press.
- Snodgrass, Donald R., and Taylor Biggs. 1996. *Industrialization and the Small Firm: Patterns and Policies*. San Francisco: ICS Press.
- Snowden, Kenneth A. 1995. "The Evolution of Interregional Mortgage Lending Channels, 1870-1940: The Life Insurance-Mortgage Company Connection." In *Coordination and Information: Historical Perspectives on the Organization of Enterprises*, ed. Naomi R. Lamoreaux and Daniel M. G. Raff. Chicago: University of Chicago Press. Pp. 209-47.
- Snowden, Kenneth A. 1997. "Building and Loan Associations in the U.S., 1880-1893: The Origins of Localization in the Residential Mortgage Market." *Research in Economics*, 51: 227-250.
- Soltow, James H. 1965. *Origins of Small Business Metal Fabricators and Machinery Makers in New England, 1890-1957*. Philadelphia: American Philosophical Society.
- Temin, Peter. 1964. *Iron and Steel in Nineteenth-Century America: An Economic Inquiry*. Cambridge: M.I.T. Press.
- Thomas, William. 1973. *The Provincial Stock Exchanges*. London: Cass.

- Tilly, Richard. 1966. *Financial Institutions and Industrialization in the Rhineland, 1815-1870*. Madison: University of Wisconsin Press.
- Tilly, Richard H. 1986. "German Banking, 1850-1914: Development Assistance for the Strong." *Journal of European Economic History*, 15 (Spring): 113-152
- Tilly, Richard H. 1989. "Banking Institutions in Historical and Comparative Perspective: Germany, Great Britain and the United States in the Nineteenth and Early Twentieth Century." *Journal of Institutional and Theoretical Economics*, 145 (March): 189-209.
- Tilly, Richard. 1992. "An Overview on the Role of the Large German Banks up to 1914." In *Finance and Financiers in European History, 1880-1960*, ed. Youssef Cassis. Cambridge: Cambridge University Press. Pp. 93-112.
- Tilly, Richard. 1998. "Universal Banking in Historical Perspective." *Journal of Institutional and Theoretical Economics*, 154 (March): 7-32.
- Tracy, James D. 1985. *A Financial Revolution in the Habsburg Netherlands*. Berkeley: California University Press.
- Wellhöner, Volker, and Harald Wixforth. 2003. "Finance and Industry." In *Germany: A New Social and Economic History, Vol. III, Since 1800*, ed. Sheilagh Ogilvie and Richard Overy. London: Arnold. Pp. 152-91.
- Wengenroth, Ulrich. 1994. *Enterprise and Technology: The German and British Steel Industries, 1865-1895*, trans. Sarah Hanbury Tenison. Cambridge: Cambridge University Press.
- Wengenroth, Ulrich. 1999. "Small-Scale Business in Germany: The Flexible Element of Economic Growth." In *Small Firms, Large Concerns: The Development of Small Business in Comparative Perspective*, ed. Konosuke Odaka and Minoru Sawai. Oxford: Oxford University Press. Pp. 117-39.
- White, Eugene Nelson. 1982. "The Political Economy of Banking Regulation, 1864-1933." *Journal of Economic History*, 42 (March), 33-40.
- White, Eugene Nelson. 1983. *The Regulation and Reform of the American Banking System, 1900-1929*. Princeton: Princeton University Press.
- White, Eugene N. 2001. "California Banking in the Nineteenth Century: The Art and Method of the Bank of A. Levy." *Business History Review*, 75 (Summer): 297-324
- Wright, Robert E. 1999. "Bank Ownership and Lending Patterns in New York and Pennsylvania." *Business History Review*, 73 (Spring): 40-60.

Table 1: Sources of Funds for Small Firms, By Country

Country	N	Internal Funds, Retained Earnings	Family, Friends, Informal Sources	Banks	Equity, Sale of Stock	Leasing, Trade Credit, Credit Card, Development funds	Total	Share of Firms with No External Finance
Albania	70	77.4	9.1	5.3	0	3.6	95.4	62.9
Armenia	59	87.5	5.9	1.9	0	2.7	98	72.9
Azerbaijan	59	81.8	5.3	1.5	0	7.1	95.7	71.2
Bangladesh	175	67.4	7.8	20.2	0.3	3.5	99.2	40.6
Belarus	51	76.8	7.8	6.3	0	5.7	96.6	56.9
Bosnia	24	69.2	4.2	6.6	0	4.2	84.2	50.0
Brazil	686	59	3.2	14.1	3.4	18.1	97.8	44.3
Bulgaria	56	68.9	10.4	6.4	2.2	4.9	92.8	58.9
Cambodia	155	25.9	23.2	2.1	44.3	2	97.5	12.3
Croatia	26	46.3	2.9	18.2	7.6	8.4	83.4	19.2
Czech Rep	62	46.6	6.6	12.3	6.7	14.8	87	32.3
Ecuador	131	45.7	7.8	24.1	3.5	16.6	97.7	34.4
Estonia	37	53.5	0	12.6	2.7	26.3	95.1	29.7
Ethiopia	43	67.7	5.45	21.1	1	2.5	97.75	51.2
Macedonia	12	75	4.2	10.8	0	0	90	50.0
Georgia	29	71.6	3.3	9	0	2.8	86.7	58.6
Honduras	132	54	10	23	1.8	10.1	98.9	43.2
Hungary	73	51.1	2.1	7.6	17.1	9.5	87.4	34.3
Kazakhstan	48	70.9	8.3	3.4	4.2	5.3	92.1	56.3
Kenya	63	48.6	2.5	37.7	0.4	6.7	95.9	38.1
Kyrgyzstan	44	69.1	9.1	4.8	0	6	89	54.6
Latvia	23	41.4	6.1	5.1	10	15.8	78.4	21.7
Lithuania	57	80.1	3.3	4.3	0	7.7	95.4	66.7
Moldova	45	64.4	12.9	15.7	0	7	100	31.1
Nicaragua	130	68.2	6	13.2	0	10.2	97.6	59.2
Nigeria	34	47.8	4.4	13.1	6.1	1.2	72.6	44.1
Philippines	69	58.3	14.1	8.3	5.3	7.7	93.7	43.4
Poland	95	58.5	0.2	11.9	0.5	13.1	84.2	43.2
Romania	69	72	5	9.2	1.7	8.5	96.4	59.4
Russia	126	75.7	4.4	5.2	0.6	8.9	94.8	56.4
Slovakia	42	59.6	2.6	4.1	12.4	15.8	94.5	31.0
Slovenia	54	70.3	0	4.3	0	10.1	84.7	24.1
Tajikistan	46	81.6	9.9	0	1.1	4.1	96.7	60.9
Tanzania	68	76.5	4.7	12.6	3.7	1	98.5	66.2
Turkey	99	80.5	4.7	6.6	0.8	1.4	94	62.6
Uganda	84	59.8	1.9	13.3	0	13.1	88.1	66.7
Ukraine	111	80.9	9.8	2.1	0.05	4.7	97.55	68.5
Uzbekistan	47	81.9	2.6	3	0.5	5.5	93.5	72.3
Yugoslavia	57	81	4.6	5.9	4.9	3.2	99.6	64.9

Source: Survey conducted Investment Climate Surveys (ICS) in 2002-2003. Small firms had more than ten but fewer than fifty full-time workers.

Table 2: Average Employment by Establishment in Selected Countries at the beginning of the Twentieth century

	All firms in the censuses	Firms with more than 20 workers	Firms with more than 50 workers
France	26	109	185
United States	67	117	176
Britain	64	N.A.	N.A.
Germany	14	53	154

Source: Table 1 from Kinghorn and Nye (1996). Because the censuses did not fully enumerate small firms, the first column (all firms in the censuses) does not accurately reflect average employment levels.

Table 3: Financial indicators for France and selected departments

	France Without Paris	Southern Massif Central	Ratio
	Large bank Branches		
In 1898	18.6	12.2	0.65
	Bank of France		
Discounts 1898	245 MF	69 MF	0.28
	Credit Foncier de France, all loans 1853-98		
Number of loans	1651	1534	0.92
Value of loans	44,5 MF	23.1 MF	0.52
	Savings banks in 1898		
Branches	15.4	15.19	0.98
Accounts	171,000	67,000	0.39
Value of accounts	93 MF	34.3 MF	0.47
	All Bank branches		
In 1829	18.3	10.26	0.56
In 1840	32.4	21.9	0.68
In 1898	70.7	64.5	0.91

Note: Southern Massif central includes Aveyron, Cantal, Coreze, Lot, Lozere. France is net of Paris. All values are per million persons. MF is Million Francs. Large banks are Banque de France, Crédit Foncier de France, Crédit Lyonnais, Comptoir National d'Escompte de Paris, Société Générale.

Table 4: Principal Source of External Finance, By Firm Size

Size	N	Family, Friends, Informal Sources are Principal External Source (% of Firms)	Banks are Principal External Source (% of Firms)	Equity, Sale of Stock is Principal External Source (% of Firms)	Leasing, Trade Credit, Credit Card, Develop-ment funds are Principal External Source (% of Firms)	% of Firms with No External Finance
Micro	1972	16.5	8.6	8.9	8.6	57.4
Small	3135	10.1	17.0	5.4	14.9	52.7
Medium	1059	5.0	24.7	4.1	16.4	49.9
Large	1058	3.8	29.0	5.4	16.9	44.9
very large	1365	3.4	30.8	4.5	14.6	46.6

Source: See Table 1.

Note: Only firms with complete data for all four forms of external finance are included in the calculations. Firms for which the category "other" was the leading source of external finance are also excluded. Micro enterprises have less than ten full-time workers; small firms, more than ten but fewer than fifty; medium, more than fifty but less than 100; large, more than 100 but less than 250; and very large, more than 250.

Table 5: Principal Source of External Finance, By Type of Ownership

Ownership Type	N	Family, Friends, Informal Sources are Principal External Source (% of Firms)	Banks are Principal External Source (% of Firms)	Equity, Sale of Stock is Principal External Source (% of Firms)	Leasing, Trade Credit, Credit Card, Develop-ment funds are Principal External Source (% of Firms)	% of Firms with No External Finance
Sole Proprietorship	2219	20.2	15.9	--	10.9	53.0
Partnership	1402	8.9	22.1	5.4	10.8	52.9
Privately Held, Limited Liability Company	3183	6.0	22.7	4.7	19.3	47.3
Publicly Listed	474	2.3	33.5	4.9	16.0	43.3
Cooperative	188	4.3	6.4	2.1	12.2	75.0

Source: See Table 1.

Note: Only firms with complete data for all four forms of external finance are included in the calculations. Firms for which the category "other" was the leading source of external finance are also excluded. For sole proprietorships, equity is treated as internal finance. Sole proprietorships that report equity plus internal funds/retained earnings equal to one hundred percent of their total finance for new investment are treated as having no external funds.