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Introduction

William J. Collins and Robert A. Margo

This book is a collection of seven research papers that were presented at a conference held at Vanderbilt University in December 2013 and revised in light of suggestions from conference participants and outside reviewers. Sponsored by the National Bureau of Economic Research and Vanderbilt University, the conference was entitled "Enterprising America: Businesses, Banks, and Credit Markets in Historical Perspective."[1] In this introduction, we provide a discussion of the background context that motivated the conference, summarize each chapter, and conclude with a brief recapitulation of the main findings and suggestions for further research.

Background Context

The American economy's ascendance from a colonial outpost into one of the world's most sophisticated and productive economies was an event

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This is the introductory chapter to the NBER conference volume *Enterprising America: Businesses, Banks, and Credit Markets in Historical Perspective*. The conference was held at Vanderbilt University, Nashville, TN, on December 14, 2013. Conference support from the NBER and Vanderbilt University's Adderley Chair and Douglas Grey gift is gratefully acknowledged. We are grateful for detailed comments from two referees that greatly improved the exposition of the introduction and the organization of the volume. For acknowledgments, sources of research support, and disclosure of the authors' material financial relationships, if any, please see http://www.nber.org/chapters/c13130.ack.

1. Coinciding with the conference were lunch and evening events celebrating the scholarly contributions of Jeremy Atack, whose research has done much to advance understanding of the general subject matter of the essays in this volume. The lunch and dinner events were sponsored by Vanderbilt University's Adderley Chair and Douglas Grey gift.

of singular historical importance. From a global perspective, by the end of the nineteenth century, the American economy had become a major force driving international trade, migration, capital flows, and business cycles. Although international comparisons of production are imprecise for the nineteenth century, it is clear that the United States rose from a peripheral position in 1800 to a leading position in the world's economic order by 1913 (Kindleberger 1996; Landes 1998; Maddison 2001).[2] Even as the world's economic output grew at an unprecedented rate, the American economy's growth nearly surpassed all others.

From a domestic perspective, there is no single metric that captures the scope of economic change and its implications for the American people, but salient features of the transformation are clearly visible. Between 1800 and 1900, the share of the labor force in agriculture declined by half (Carter 2006, 2–18), coinciding with the steady rise of towns and cities. At the same time, the geographic center of the population shifted dramatically westward, from near Baltimore to near Indianapolis (US Census Bureau 2011). Within the manufacturing sector, the rise of the factory system and subsequent business consolidations led to "huge corporations mass producing standardized products for a national market" (Atack and Bateman 2006, 4–575). This was encouraged and facilitated by the new network of railways, which sharply cut interregional transportation costs and physically tied markets together into a large, open, commercial space. Finally, the development of the banking and financial sector, despite several crises, provided credit and capital to firms, farms, and consumers, thereby fueling economic growth while in turn benefiting from it.

A basic starting point for understanding the history of American economic growth is to model total output as a function of technology and "factors of production," including labor, capital, and other resources. With certain assumptions and macroeconomic data, technological improvements and additions to the stock of factors provide a comprehensive "accounting" for economic growth (Denison 1962). Such an accounting reveals, for example, that growth in factors of production played a larger explanatory role in accounting for growth in the nineteenth century than in the twentieth.

Behind the growth-accounting framework is the economist's conventional model of industry demand and supply. In the workhorse version of this model, production in the long run is characterized by constant returns to scale. As such, the identities and characteristics of production units—pointedly, their size and location—are ignored in the interest of focusing on the aggregate outcome, and little or no attention is paid to the underlying institutional setting. Indeed, an assumption of "atomistic" production, in

2. Maddison (2001, appendix B), for example, estimated that between 1820 and 1913, the two benchmark dates closest to the start and end of the nineteenth century, the US share of global GDP increased from below 2 percent to nearly 20 percent.

which each unit is very small and produces a tiny share of aggregate output, is often made because it greatly simplifies the analysis.

Economic historians know that the textbook model only scratches the surface of the actual process of economic growth. In particular, the editors and authors in this volume, along with many other scholars, believe that understanding the growth process requires unpacking the historical context in which individuals came together to form voluntary associations whose goal was to provide goods and services to markets and, in doing so, to earn profits.[3] We use the common English word *enterprise* to refer to such associations.[4]

For an enterprise to be economically successful, certain problems of internal organization had to be solved, and factor inputs—capital, labor, real estate, raw materials—had to be assembled and put to productive use. These activities were (and are) pursued within a framework of laws and institutions that set the ground rules for the organization and operation of economic entities. Effective laws and institutions form the foundation, if not the sole motivation, for modern economic growth. Ideally, if not always in reality, they are designed to encourage enterprise when it is in society's interest and also to constrain undesirable behaviors, such as those associated with principal-agent problems in corporate governance or the powers of the state itself. They change, sometimes slowly and sometimes abruptly, as economic and political environments change. Indeed, some laws and institutions that fostered certain types of enterprise in the past are no longer viewed as morally acceptable and have been repudiated and discarded. Chattel slavery is the obvious example.

Enterprises in American history have come in many different forms and structures, depending on the nature of the productive activity, the state of technology, and the laws and institutions governing them. At one end of the spectrum in the nineteenth century there is the family farm—small production units consisting almost entirely of workers bound together by family ties that produced for their own consumption and, increasingly over time, for the market. At the other end there are enterprises like Carnegie Steel or Standard Oil, very large firms that sought to exploit their size to enrich their owners to levels unimaginable, and often feared, by ordinary citizens. In between are many other enterprises, including entities that were formed to complete infrastructure projects in conjunction with state and local govern-

3. We recognize that many enterprises are nonprofit associations and that government is also a form of enterprise. Our focus in this volume, however, is on enterprises formed for the purpose of seeking profit.

4. Our use of "enterprise" is flexible but always in keeping with standard definitions of the word. For reference, the American Heritage Dictionary defines "enterprise" as "an undertaking, especially one of some scope, complication, and risk"; "a business organization"; "industrious, systematic activity, especially when directed toward profit"; and "willingness to undertake new ventures; initiative." *American Heritage Dictionary of the English Language*, 5th ed., s.v. "enterprise."

ments, railroad and canal companies, wholesale and retail establishments, and banks and other financial firms.

Within the framework of laws and institutions, enterprises interact with one another in ways that can be productivity enhancing because they complement one another across sectors, such as banks that provide credit to farmers, or because they compete with one another within sectors, such as firms within manufacturing that vie to offer goods at lower costs or to invent entirely new goods. The ensuing processes of innovation, investment, and factor accumulation connect enterprise-level, profit-seeking initiatives with macrolevel economic growth. Because the legal framework in the United States emerged from a deep colonial history and continued to evolve at the state level throughout the nineteenth century, there is institutional variety across space and time and, in some places, exceptionally detailed enterprise-level data. This history, in turn, provides ample opportunity to study institutions, their evolution, and their ramifications for business organization and performance.

It is this historical context that motivated our conference. To be sure, the issues sketched above are hardly undiscovered territory. American economic historians have written extensively about the history of business law and business enterprise; changes in the scale of production in manufacturing; the shift of labor out of small scale, family agriculture and its implications for aggregate labor productivity growth; the evolution of banking and capital markets; and many related issues, such as growth of government regulation. No single volume can hope to cover all of these topics in depth or provide a comprehensive overview of all the relevant economic history literature.[5] Indeed, that is not what we are attempting to accomplish in this volume of research papers. Rather, the authors whose work appears in this volume have made important contributions to the economic history of American enterprise in their prior scholarship, and all have current research projects that engage key features of this history. The conference, therefore, provided a convenient and productive association of scholars—an enterprise, if you will—in which to take stock of ongoing work, to exchange knowledge and ideas that could further advance their research, and to find parallels and complementarities in each other's projects.

Volume Summary

The volume is organized into three sections: Business Organization and Internal Governance, Bank Behavior and Credit Markets, and Scale Economies in Nineteenth-Century Production. We summarize each chapter below and highlight connections among them. Since each chapter represents new

5. Readers seeking a broad historical overview of some of these themes may consult Neal and Williamson (2014).

and original research, we do not expect them to dovetail with one another seamlessly. Instead, they provide multiple, often overlapping, perspectives on the organization and operation of "enterprise" during the period of American economic ascendancy.

Section I: Business Organization and Internal Governance

Section I consists of three chapters that focus on the economic history of business organization and internal firm governance. Chapter 1, by Naomi R. Lamoreaux, examines the evolution of law governing the formation of business enterprises in the nineteenth century. Chapter 2, by Eric Hilt, studies how the corporate form of business organization diffused among manufacturing establishments during the second half of the nineteenth century. Chapter 3, by Howard Bodenhorn and Eugene N. White, studies changes over time in the corporate governance of New York state banks.

In a series of important articles and books Lamoreaux (see the citations in her chapter) has explored, solely and with collaborators, the evolution of the legal frameworks governing the types of organizational forms that businesses could adopt in the United States and Europe. These frameworks circumscribed many of the specific features of the enterprises, conferring on them certain rights and privileges that, when necessary, could be defended in a court of law—that is, rights and privileges analogous to, if different from, those enjoyed by actual persons. Broadly speaking, the constraints imposed by the legal framework set the menu of organizational forms that could be legally adopted and also the extent to which the forms might be modified contractually to suit the special needs of the parties.

It is a stylized fact of modern economics that the economies of countries whose legal frameworks originated in the common law seem to have performed better in the long run than those whose legal frameworks originated in civil code as evidenced, for example, by cross-country growth regressions. This would include those aspects of the frameworks governing organizational form in business. Under common law, for example, one might suppose that the available organizational forms provided for more contractual flexibility than under civil law, which was more rigid, and that contractual flexibility was growth enhancing.

In cross-country regressions, common-law countries are usually grouped together, and the difference in long-run performance is measured by the coefficient of the common law dummy variable. Yet a crude categorization of this nature may obscure more than it reveals if there are consequential differences in legal frameworks within groups. Lamoreaux argues that the United States and Great Britain are examples of highly successful common law countries that, nevertheless, diverged significantly in the evolution of the legal framework governing business organizational form. These differences did not arise because of differences in geography, climate, or other "fundamentals," but rather in politics. Specifically, suffrage was more

inclusive earlier in the United States than in Great Britain and the widening of the electorate materially influenced the evolution of law governing business organizational forms. Broadly speaking, laws were more restrictive in allowable forms and in the flexibility permitted to parties to contractually modify these forms in the United States than in Great Britain. The historical evolution of the relevant law in both countries follows the give and take of democratic politics, and careful attention to the politics provides essential insights into the behavior of voters, legislatures, lobbyists, and others regarding tensions between equity and efficiency.

Lamoreaux begins by noting that Americans in the early nineteenth century wanted "progress" and knew that individuals alone generally could not make it happen. Rather, progress depended on profit-seeking associations of individuals, but such enterprises would not be formed unless the parties to them were conferred certain legal rights and privileges. No one would invest capital in an enterprise, for example, if someone else could abscond with the investment with impunity. Yet at the same time, Americans were keenly aware that conferring such rights and privileges generally and easily to a fictional business "person" under the law might lead to abuses and an undue concentration of economic power and wealth. The most important example is the corporation, with its characteristic of limited liability. On the one hand, corporations might be able to undertake large-scale infrastructure projects or production, allowing the public to benefit and investors or shareholders to reap profit. But what might happen if the enterprise became too large or too powerful, or if the investors were unable to monitor effectively the actions of the managers and employees? The tensions between efficiency (the desire for business to be of optimal size and structure) versus equity (the desire that the "moneyed elite" not become too powerful) sharpened during the nineteenth century as the transportation revolution opened up new lands and economic opportunities and as technological change increased the optimal scale of production, particularly in manufacturing.

Lamoreaux illustrates this point through a detailed examination of the historical process by which one state, Pennsylvania, modified its incorporation statutes over the nineteenth century. Corporations were a "hot button issue" in Pennsylvania in the late eighteenth and early nineteenth centuries. As in other states at the time, only special charter of the legislature could create corporations in Pennsylvania. From the standpoint of those wishing to form a corporation, securing a charter was a costly and protracted endeavor. Pennsylvanians who were wary of the corporate form approved of the restricted supply but were also keenly aware that those who were granted corporate charters might wish to protect their privileges, for example, by insisting on monopoly power or campaigning against new charters, and hence competition, in the same industry.

These concerns came to the fore during the constitutional convention held in Pennsylvania in 1837, a time of general financial crisis in the country.

Some delegates wished to impose severe restrictions on existing corporations and the ability to form new entities, but they faced opposition from those believing that such restrictions would be an infringement on property rights and a drag on economic development. In the end, the convention adopted additional restrictions on the length of charters for banks and gave the legislature the power to modify or abrogate existing charters under specified conditions. Other than these, the convention did not restrict the ability of the legislature to issue charters, but neither did it take the additional step of passing a general incorporation law. The legislature did begin passing laws pertaining to certain industries and economic activities.[6] Enacting a chapter every time a corporation wished to be set up was costly not only for those wishing to incorporate but also for the legislature. The industry-specific laws relaxed some of this pressure and also provided experience in drafting legislation. But the laws were still very restrictive, so much so that prospective incorporators continued to seek special charters, again prompting charges that the legislature was granting special favors and advantages. Another convention was held in 1872–1873, leading eventually to the replacement of special charters with the adoption of a general incorporation statute in 1874.

Title notwithstanding, the general incorporation law pertained only to specific activities and imposed restrictions on liability and governance structure. Those delegates desiring greater flexibility, however, fashioned a way out with an 1874 statute permitting a type of limited partnership similar in some ways to a modern limited liability corporation (LLC). But the limited partnership was still subject to various restrictions, and it took time for the courts to sort out the implications for partner liabilities under the new form. When this happened in the 1890s, the form was initially popular, but enthusiasm quickly waned. This was the era of the first great merger wave in American industry, and states such as Delaware began to compete to have companies incorporate within their boundaries, finding the fees to be a profitable source of revenue, or what Lamoreaux calls "corporate charter mongering."

The upshot of Lamoreaux's narrative is that the history of law governing business organization in Pennsylvania seems hardly to be a tale of "efficient" institutional change. Rather, it is a tale where politics took center stage. Politics continued to play an important role in shaping the law's evolution well into the twentieth century, so much so that British observers in the 1950s marveled at the apparent inflexibility of American corporation law, which the British treated as the province of contractual negotiation between the parties. However, as Lamoreaux goes on to show, the history of British "laissez-faire" policy toward business organization is full of examples of company charters written in ways that rewarded self-dealing, duplicity, and other "bad" behavior difficult for outsiders to observe, let alone police.

6. In manufacturing these were first passed in 1849, and in banking in 1860.

When universal suffrage was finally extended in Britain in the early twentieth century, British corporation law began to be more favorable to the interests of shareholders and other stakeholders, such as employees.

The implications of Lamoreaux's argument are striking. On the one hand, it is easy to imagine that the roadblocks to forming business entities in Pennsylvania in the nineteenth century might have prevented or diverted elsewhere some worthwhile corporate investment, with consequences for growth and development. As the chapter by Eric Hilt (chapter 2, this volume, see the discussion below) shows, the corporate form was used more frequently by large-scale, capital-intensive enterprises. On the other hand, it is difficult to argue with the evidence of corporate abuses in Britain that Lamoreaux and her collaborators have uncovered. It is conceivable, in other words, that the more restrictive nature of American law in the nineteenth century was more protective of shareholder rights and, therefore, encouraged greater investment and growth.

The struggles in the Pennsylvania legislature over the statutory treatment of business organization played out in other northeastern states at the same time and against the same backdrop of industrialization. If manufacturing establishments had remained tiny, as they were at the start of the nineteenth century, then the history of incorporation law might have played out very differently. But this was not to be because the growth of the manufacturing sector was associated with dramatic changes in the distribution of firm sizes and in production methods. Manufacturing firms, on average, became much larger and more capital intensive, especially after the development of steam power and (late in the century) electricity, primarily as a result of growth among the largest enterprises.

Larger, more capital-intensive firms had greater financing needs and more difficult problems of internal governance to solve. Economic historians believe that the corporate form helped in both respects and that the diffusion of the form must have been positively related to size and capital intensity. In this regard, the prevailing wisdom is heavily influenced by the classic study by Berle and Means (1932), which pointed to the fundamental corporate governance issue of "ownership versus control." In the modern corporation, which Berle and Means asserted emerged around the turn of the twentieth century, ownership is widely dispersed among passive investors, and decisions are instead made by managers whose incentives are not necessarily aligned with shareholders.

Economic historians have long been aware of counter examples to the timing cited by Berle and Means, especially among the large textile firms in New England that incorporated early and also made early use of equity financing. However, as Eric Hilt emphasizes in chapter 2, the broader economic history of incorporation is not as well documented or understood as it should be. Hilt's chapter takes an important step forward by analyzing a novel source of data, so-called "certificates of condition," which recorded the nature of

firm ownership, lists of stockholders and directors, and certain accounting data. Beginning in the 1870s, Massachusetts required all business enterprises in the state to submit these certificates annually. Hilt analyzes the extant certificates for 1875, a year in which Massachusetts also conducted an industrial census, which provides useful correlates for an empirical study of variation in the use of the corporate form.

Hilt's analysis is in three parts. In the first part, he uses business directories to classify establishments listed in the certificates into the industrial categories used in the 1875 Massachusetts census. Because the census reported the total number of establishments by industry and other industry characteristics, Hilt is able to compute incorporation rates by industry and explore correlations between incorporation rates and average establishment characteristics. Although the sample sizes are small, he shows that incorporation rates were higher in industries with larger establishments, measured either by capital or total employees. He also demonstrates that industries that utilized more steam power, unskilled labor, and fixed capital had higher incorporation rates. These characteristics are associated with factory production, and the patterns suggest that the growth of the factory system and incorporation were closely tied, at least in Massachusetts.

Next, Hilt examines more closely the ownership and governance patterns among corporations. He looks first at textile firms listed on the Boston Stock Exchange, finding that ownership was typically dispersed across passive investors and that day-to-day operations were under the control of hired managers (rather than the owners per se). The textile firms were unusual, however, and the typical manufacturing firm had relatively few shareholders and a high degree of ownership among those operating and managing the business. Turning to the determinants of ownership structure, Hilt finds a positive association between establishment size and the degree to which establishments were widely held. Conditional on size, establishments with characteristics that are associated with factory production had more concentrated ownership. Hilt argues that in Massachusetts, "incorporators and investors responded to the challenges posed by the complex role performed by managers" and engaged in factory production by establishing "adequate ownership incentives to monitor and supervise management."

The issues of organizational form and corporate governance were hardly confined to the growing industrial sector of the American economy in the nineteenth century. If anything, they were more important in the financial sector because from time to time—indeed, to our present day—problems in banks had a way of spilling over powerfully to the rest of the economy, causing financial panics and economic downturns. Yet, economic historians know more about the long-term evolution of governance in the nonfinancial sector than in the financial sector.

In chapter 3, Howard Bodenhorn and Eugene N. White take a step toward remedying this deficiency by presenting a first look at a large, new body

of archival evidence on the changes in bank governance over time. The evidence pertains to the state of New York, which required banks to file detailed "articles of association" describing their governance features, such as the time and place of shareholder meetings, shareholder voting rights, and many others. Some of these features are also found in the "certificates of condition" analyzed by Hilt. Bodenhorn and White's analysis uses a sample of the surviving articles for state-chartered banks in New York beginning in 1838 in conjunction with two other sources of information: the annual reports of New York's Bank Superintendent and city directories for New York City, Albany, Buffalo, and Rochester, which provide lists of banks and their directors.

Bodenhorn and White begin their analysis with an overview of the key legislative changes in New York banking history. This provides a broad dating of regime shifts in banking regulation: the eras of chartered banking (1789–1837), free banking (1838–1863), the National Banking System (1864–1913), the early Federal Reserve (1914–1933), New Deal banking (1934–1970s), and the current period (1970s to the present). They use this taxonomy as a frame of reference for their analysis of two features of bank governance: separation of ownership from control, and the size of the board. They report two key preliminary findings. First, during both the free banking and National Banking System eras, bank directors tended to hold a large fraction of bank shares, considerably more than was required by law. In effect, the bank managers must have had a significant fraction of their personal portfolios at stake, which, in Bodenhorn and White's view, properly incentivized their behavior. Ownership and control, in other words, were effectively the same in New York's banks throughout the long nineteenth century.

Second, Bodenhorn and White observed a decline over time in the size of bank boards. While some of this decline can be attributed to an "aging" process within each bank—the longer that a bank was in business, the smaller was its board—a significant portion appears to have been a long-term trend in the banking sector. They suggest that some of this decline may reflect changes in the composition of the boards and the degree of specialization of their members, but they also speculate that regime shifts in bank regulation played a role. It remains for future research to parse out the relative contributions of changes in banking practice versus regulation, as well as the implications for economic performance of the decrease in board size.

Section II: Bank Behavior and Credit Markets

The middle section of the volume presents two chapters that make use of geographic information to study bank behavior and the evolution of capital markets. Both chapters develop and analyze new, richly detailed data sources. Chapter 4, by Jeremy Atack, Matthew S. Jaremski, and Peter L. Rousseau, studies how bank behavior and stability responded to the spread

of the transportation network before the Civil War. Chapter 5, by Mary Eschelbach Hansen, uses microlevel data drawn from bankruptcy records to characterize credit market relationships in the 1930s, including the physical distance between borrowers and creditors.

By passing laws to regulate organizational form and internal governance, states could hope to influence the economic behavior of businesses and banks in ways that would promote economic growth and the efficient allocation of resources. Economically virtuous behavior, however, might also have arisen endogenously in response to technological and other nonstatutory changes associated with economic growth and development. One possible causal linkage of this sort involves the so-called "transportation revolution." Starting well before the Civil War, the United States developed a geographically dispersed network of inland waterways and railroads that profoundly and permanently shaped the pace and pattern of economic activity. Although there is a long tradition in economic history of studying the aggregate resource-saving effects of transport innovations, it is only recently that economic historians and other scholars have been able to study other types of impacts, making use of detailed information on transportation access at a disaggregated level. This has been made possible by the development of geographic information systems (GIS) software that permits the construction of statistical databases embodying complex spatial relationships from digitized historical maps and other sources with spatial information. These databases can then be linked to other historical databases with information on local economic characteristics and outcomes, typically at the county level.

Atack (2013) has been a pioneer in the application of GIS methods to the construction of county-level databases that document the spread of the transportation infrastructure in the nineteenth-century United States. Atack's databases have been used to study the county-level effects of gaining rail access on population density and the rate of urbanization (Atack et al. 2010); the proportion of establishments meeting a definition of "factory" status (Atack, Haines, and Margo 2011); per-acre land values in agriculture, agricultural improvements, and the rate of landownership (Atack and Margo 2011, 2012); and other aspects of the transportation revolution (Donaldson and Hornbeck 2013).

In chapter 4, Atack, Jaremski, and Rousseau consider the intriguing possibility that better transportation, specifically railroad access, led to improved bank stability and performance before the Civil War. The point of departure for their analysis is the observation that antebellum banks did business by issuing bank notes. The notes were redeemable for their face value at the issuing bank, and states required banks to hold collateral equal to the notes' value. Until they were redeemed, those bank notes also functioned as a medium of exchange, usually trading at a discount that, among other factors, varied with transportation costs to the issuing bank.

Atack, Jaremski, and Rousseau further point out that monitoring of bank behavior by regulators during the antebellum period appears to have been much looser than today, and the incentives of bankers did not necessarily align with their liability holders. This led to unsound practices known as "wildcat banking" in the colorful language of the period. As a consequence, banks would sometimes fail, meaning that they were unable to redeem their notes.

The authors posit two reasons why an improved transportation network might have reduced bank failure rates. First, better transportation might generate greater local economic activity, leading to higher bank loan rates, profits, and possibly, more diversified loan portfolios. Second, improved transportation might make it easier and less costly for a bank's customers to redeem their notes, and more generally, increase the effective monitoring of the bank to the extent that transportation improvements facilitated access to information about bank activities. Of course, it is possible that a correlation between proximity to transportation and bank stability is merely a reflection of other factors. For instance, there could be selection across locations such that less scrupulous bankers might have gone to the frontier where they could operate more freely (that is, with less scrutiny) while more honest bankers might have gone to settled areas that happened to be served by railroads or navigable waterways.

To explore these hypotheses, Atack, Jaremski, and Rousseau assemble a remarkable panel data set that links information on individual-level banks with information on the diffusion of the railroad system over time. The authors know the location of each bank, and so they are able to measure its distance from the nearest improved means of transportation (steamboat-navigable river, canal, or railroad). Their primary interest is in the effect of the railroad specifically, and so availability of other means of transportation acts as a control variable in their analysis. Crucially, the information is available at sufficient frequency that they are able to observe banks in operation prior to the arrival of a railroad in an area as well as banks that entered after the railroad's arrival. The authors also observe a number of indicators of bank performance and balance sheet-type variables. In particular, they are able to observe bank failures, defined to occur when banks were not able to redeem notes at full value.

The chapter contains two main econometric analyses. The first uses hazard models to study the factors associated with bank failure. The main finding is that proximity to a railroad is associated with a statistically significant, reduced likelihood of bank failure. The negative association between bank failure and rail access is shown to be robust to a number of modifications to the base sample, such as restricting the sample to banks that were present prior to the arrival of a railroad. The negative association between failure and transportation is observed only for railroads, not for inland waterways like navigable rivers or canals. The hazard model analysis reveals that the

negative association of bank failure and railroad proximity is reduced when county-level controls for economic characteristics (for example, population or urbanization) or bank balance sheet variables are included, but the estimated effect remains negative and significant.

In the second main analysis, the authors estimate regressions relating bank characteristics to rail access. While not definitive, the results suggest that some of the lower failure rates can be attributed to the effect of railroads on local economic activity, which banks responded to in ways that made them less vulnerable. The authors find suggestive evidence that, after the arrival of a railroad in close proximity, banks reduced excess reserves, the number of notes in circulation and their bond holdings, and increased their loan/asset ratios relative to other banks in the same area that were not as physically proximate to rail service. The authors interpret decreased note circulation as consistent with a "presumed increase in the ease and likelihood that notes would be presented for payment when the railroad made travel easier and faster." Overall, they conclude that, "railroads seem to [have] lowered failure rates by encouraging banks to operate more safely through increased loan as well as lowered bond holdings and circulation." While further research will be necessary to pin down the precise causal mechanisms behind the apparent impact of rail access, an important implication of Atack, Jaremski, and Rousseau's chapter is that by improving the stability of the banking system, the railroad encouraged economic development in ways that are not reflected in traditional measures of the social savings of the rail network (Fogel 1964; Fishlow 1965).

Banks were but one component of a wide variety of organizations that made up the American credit market as the economy grew in the nineteenth and into the twentieth century. Economic historians have studied the evolution of the structure of this market (for example, the varying mix of different types of financial institutions) and its efficiency at allocating resources between competing uses as measured by interest rate differentials. One set of competing uses concerns geography and, specifically, interest rate differences across regions (Davis 1965; Bodenhorn and Rockoff 1992). Such differences are important because the United States economy and its frontier expanded westward from the eastern seaboard, and any impediments to capital mobility could slow the extension of economic activity. Economic historians have established that interest rate differentials narrowed across regions as improvements in transportation and communications increased the information available to financial intermediaries and enabled arbitrage to take place. However, another set of competing uses involves sectors, such as manufacturing versus the agricultural or service sector. Differences in rates of return between sectors were large in the late nineteenth and early twentieth centuries, suggesting that capital did not flow as freely as it might have between sectors (Atack, Bateman, and Weiss 1982). Differences across sectors are important because a central feature of American development

has been a relentless shift of resources out of agriculture and into other sectors.

In chapter 5, Mary Eschelbach Hansen takes a fresh look at these differences across sectors using as her lens a large sample of archival records of bankruptcies filed under federal law, a source of exceptionally detailed data that has received only limited attention from economic or financial historians. It has long been known that these records, which date back to the late nineteenth century when the first permanent bankruptcy law was passed, provide remarkable details on borrowers, creditors, and their loan arrangements. Hansen's project involves collecting and digitizing a sample of the extant bankruptcy records. Although the project is still at a relatively early stage, her chapter illustrates the promise of these records and provides substantive new insights into differences in credit relationships across sectors.

Hansen focuses her attention on the experience of one state, Mississippi, over the period 1929 to 1936. A general concern with using bankruptcy filings is their representativeness of the population of borrowers (or potential lack thereof) and, therefore, our ability to generalize on the basis of evidence drawn from such records. Individuals or businesses who file for bankruptcy are unlikely to be a random sample of borrowers, and their creditors may also differ systematically from the relevant population. Such concerns are mitigated to the extent that bankruptcies arise from bad luck as opposed to strategic behavior, which is more likely during an economic downturn such as the Great Depression. As Hansen shows in an illuminating comparison using aggregate data for Mississippi from R. G. Dun and Company for 1929 and 1931, her sample of 780 bankruptcy files looks similar to all Mississippi firms covered by Dun with respect to industry and size.

Hansen begins her chapter with a succinct overview of what economic historians believe to be the evolution of capital markets in the nineteenth and early twentieth centuries. As she points out, it is believed that banks during this period did little in the way of direct lending to manufacturers. Instead, capital needs for manufacturing were met through the formation of organizational structures that facilitated investment from private individuals and related sources, or from retained earnings. Banks did play an important role through the emergence of a national market in trade credit and bankers acceptances (short-term debt issued by a firm and backed by a bank). Merchants also played key roles through the extension of trade credit on book account. By the late nineteenth and early twentieth centuries, banks and related financial entities began lending directly to consumers and to large businesses, but it was not until after World War II that commercial lending to small- and medium-sized businesses became common. Although much of the lending that took place was local, it is thought that the distances between borrowers and creditors grew over time.

The general contours of this evolution are known, but documenting the frequency and magnitude of credit relationships has been difficult because

it requires detailed knowledge of the borrowers and lenders. Hansen's approach can advance our knowledge because the information included in the bankruptcy filings is so detailed that she can study the type of loans (for example, trade credit), the amounts involved and purpose, the characteristics of the creditors and borrower, and their location. She finds that a solid majority of bankruptcy filings in her sample pertain to business enterprises (60 percent; see her table 5.1), and the overwhelming majority of debts were owed to commercial lenders, though their relative importance depends on whether the count of debts is weighted by their value.[7] The data also show that manufacturers in the 1930s rarely incurred debt from financial institutions and that long-distance credit was far from uncommon. Long-distance credit was more common than average among merchants, however, than was the case for manufacturers.

Although the generality of Hansen's quantitative findings remains to be established, her preliminary results are broadly consistent with previous beliefs about the evolution of American capital markets. She points out that, for the most part, financial institutions did not facilitate production by lending directly to manufacturers, but rather did so indirectly through the consumer and wholesale credit channels. Credit expansion, in turn, fueled demand, providing incentives to capture economies of scale in production.

Section III: Scale Economies in Nineteenth-Century Production

The final two chapters study economies of scale in production in the nineteenth century.[8] Chapter 6, by Robert A. Margo, addresses manufacturing, and chapter 7, by Alan L. Olmstead and Paul W. Rhode, examines agriculture.

Industrialization was an important driver of economic growth in the nineteenth-century United States. It had its roots in New England but spread to the rest of the nation by the late antebellum period. Productivity growth in manufacturing was so rapid that by the late nineteenth century, American manufacturing workers were more productive than their counterparts in Europe, where the Industrial Revolution began. Coinciding with the growth of manufacturing was a shift in production from small to large establishments, that is, from "artisan shops" to "factories" (Chandler 1977). According to the conventional view among economic historians, factories enjoyed a productivity advantage over artisan shops through the exploita-

7. Nearly three-quarters of all recorded debts were to commercial businesses, but the average value per debt owed to commercial businesses was relatively small, such that only one-third of debts weighted by value were owed to commercial businesses (table 5.2).

8. Our use of the term "economies of scale" is standard: a disproportionate increase in output that occurs when the size of the enterprise grows. Economies of scale are realized typically through greater division of labor or, alternatively, capital equipment (for example, powered machinery) that is "lumpy"—use of the equipment cannot be scaled down so the enterprise needs to be a certain size before it can be profitably employed.

tion of economies of scale achieved through division of labor and mechanization. In turn, the shift toward larger-scale production was facilitated by legal changes that made it easier for establishments to incorporate (see chapter 1 by Lamoreaux and chapter 2 by Hilt); improvements in the functioning of the financial system (as discussed in chapter 3 by Bodenhorn and White and chapter 4 by Atack, Jaremski, and Rousseau), which helped support industrial expansion (Rousseau and Sylla 2005); improvements in transportation that created incentives to expand production and, therefore, implement division of labor and mechanization (Atack, Haines, and Margo 2011); and the development and diffusion of steam power, which provided an expandable source of power and surpassed the productivity gains achievable though division of labor alone (Atack, Bateman, and Margo 2008).

For some economists, the mere shift toward larger-scale production in manufacturing is tantamount to evidence of economies of scale in some form. However, alternative explanations are possible, and even taking the shift at face value one cannot quantify its importance as an explanatory factor in aggregate productivity growth without first measuring the difference in the level of productivity between small and large manufacturing establishments.

In this context, many economic historians cite and teach an iconic paper by Kenneth Sokoloff (1984) as evidence in favor of the conventional wisdom that larger manufacturing establishments were more productive than smaller establishments. Using samples of establishment-level data from the 1820 and 1850 censuses of manufacturing, Sokoloff presented econometric estimates of economies of scale from production functions. His results reveal economies of scale for "nonmechanized" establishments that relied entirely on hand power rather than steam or water power. The interpretation of this result is that such firms must have been able to capture scale economies through the division of labor alone.

A crucial feature of Sokoloff's analysis is an adjustment he made for a specific measurement problem in the original census data—the alleged underreporting of the labor input provided by the establishment's owner or owners. This issue is critical because the labor input of owners was a larger fraction of the total labor input in small establishments than in large establishments. In very small shops, the owner might be the only worker (a sole proprietor) or might work alongside an apprentice or two. In a somewhat larger establishment, the owner (or owners) might eschew production work and instead concentrate on management, marketing, record keeping, or other nonproduction tasks. If the firm was large enough, such as the textile mills studied by Hilt in his chapter, the owners might have little or no involvement directly in production or nonproduction activities. That is, hired employees provided labor of every type. In effect, Sokoloff was arguing that the early censuses of manufacturing did a good job of counting the number of hired employees but systematically ignored the labor input of owners. If this argument is correct,

then labor productivity in small establishments, as measured by the census, would be biased upward relative to large establishments, possibly masking the presence of economies of scale. Sokoloff solved this problem by devising protocols to impute the labor input of owners in 1820 and 1850. The protocol for 1850 was particularly simple—he added one to the count of workers.

Although Sokoloff did not investigate economies of scale for years after 1850, the measurement of the "entrepreneurial" or owner's labor input is still germane because it was not until 1890 that the federal census included separate questions on production and nonproduction workers. In chapter 6, Robert A. Margo explores the implications of this particular measurement issue using the Atack and Bateman (1999) samples of the 1850 to 1880 censuses of manufacturing. Margo first demonstrates that parametric estimates of economies of scale for these census years are "knife-edge" with respect to the measurement issue raised by Sokoloff and his proposed solution to the problem. That is, if Sokoloff's solution for imputing the labor of owners is implemented, then there is evidence of broad-based economies of scale in manufacturing between 1850 and 1880, including nonmechanized establishments, but if the imputation is not adopted, there is no such evidence.

Next, Margo assesses the textual and statistical distribution evidence bearing on Sokoloff's claim that the censuses undercounted the labor input of owners. Margo shows first that the census recognized the issue in its formal instructions to enumerators, specifying the conditions under which the owner was to be included in the count of workers.[9] Margo also argues that if the owner's input were not counted routinely there should be considerable numbers of establishments reporting zero employees in the Atack-Bateman samples because sole proprietorships were very common at the time; however, the number of such establishments is very small. Contrary to Sokoloff, Margo concludes that, by and large, the census did count the labor input of owners when it was supposed to do so.

That said, Margo also shows that the labor input, as measured by the census, was underreported in small establishments for a reason entirely different from that asserted by Sokoloff. This bias arises because the labor input in the nineteenth-century manufacturing censuses refers to the number of workers present during a typical day of operation, not a literal (or true) average. However, throughout the year manufacturing establishments would add or shed workers to meet temporary production needs. For larger establishments, the distribution of workers employed on any given day appears to have been more or less symmetric around the typical number, whereas for small establishments, it is right-skewed. Correcting for this problem does lower the measured labor productivity in smaller establishments relative

9. The condition was that the labor input of owners was sufficiently frequent and large enough for the owner to be considered part of the work force present on a typical day of operation.

to larger ones, but the correction is much smaller in magnitude than that implied by Sokoloff's imputation. Margo demonstrates these points by using unpublished data collected by the 1880 census and argues that it is plausible that his findings apply to earlier census years because the census questions on employment in manufacturing were fundamentally similar across years.

One might be tempted to read Margo's findings as showing that the smallest manufacturing establishments were more productive than previously thought and, therefore, worthy of more careful scrutiny by economic historians. As Margo notes, while this avenue is worth pursuing, it seems more likely that the consensus view is still correct, but the nineteenth-century manufacturing censuses are simply not well suited to the parametric estimation of scale economies. To address the measurement issue, therefore, sources of data with more detailed information on production and input use than the census are needed to assess the productivity implications of the shift to large-scale production (see Griliches and Ringstad [1971] for a similar argument for twentieth-century data). Indeed, in ongoing work Atack, Margo, and Rhode (2014) are examining one such alternative source, a large-scale study conducted by the US Bureau of Labor Statistics in the 1890s that collected data on hand production and mechanized (machine) production of very specific goods. Their preliminary work shows strong and robust evidence that larger firms were, indeed, more productive than smaller firms, and that both division of labor and powered machinery explain the productivity differential with respect to establishment size.

To this point the volume has primarily focused on the nonfarm sector of the American economy, yet farms were the most ubiquitous form of American enterprise in the nineteenth century. Most, as we noted earlier, were small, family-run operations, using hired labor only occasionally (for example, the harvest) or if no family members were available. To be sure, the family farm had its share of internal governance problems and needs for external finance, but these were quite different from industrial enterprises. Economic historians believe that, for the most part, scale economies in nineteenth-century agriculture were either nonexistent or else exhausted at quite low levels of output (and by extension, number of workers). Substantial scale economies in farm production and the rise of corporate agriculture came in the twentieth century, for the most part after World War II.

The most important and perhaps the only exception to the above characterization was the slave plantation in the antebellum South. These were among the largest and most sophisticated businesses of their time. According to Fogel and Engerman (1974; see also Fogel 1989), plantations enjoyed substantial economies of scale that came about, in part, through the use of the so-called gang system. In Fogel and Engerman's view, the gang system involved division of labor, but instead of taking place on the shop floor, it took place in the field. The evidence for economies of scale derives from extensive and detailed (and controversial to some) econometric analysis of the so-called Parker-Gallman

sample, which provides evidence on outputs and inputs for approximately 5,000 free and slave farms on the eve of the Civil War.

Fogel and Engerman were not the first to address the issue of economies of scale in slave agriculture. Rather they took as their starting point an extensive literature in history that viewed the antebellum plantation as "factories in the field" (see, for example, Stampp 1956). But is this metaphor justified and, by inference, is there support for Fogel and Engerman's explanation for the slave productivity advantage? In chapter 7, Alan L. Olmstead and Paul W. Rhode take the "factories in the fields" analogy at face value and then dig deeper into a wide range of historical sources to see whether the supposed similarities hold up under closer scrutiny. Collections of data from nineteenth-century census manuscripts—the Parker-Gallman sample of southern farms, the Bateman-Foust sample of northern farms, and the Atack-Bateman samples of manufacturing establishments—form the basis for their quantitative comparisons of the inputs and outputs of farms and factories. They also draw from a variety of primary and secondary sources, including a fresh reading of surviving plantation records, to characterize the operation of antebellum cotton plantations, to compare and contrast their management and operation with that of contemporary factories, and to challenge some influential descriptions of cotton production under slavery.

Olmstead and Rhode's conclusions are mixed. In some respects, such as their use of professional managers, relatively large labor forces, and share of output, plantations were similar to factories, or at least were more similar to factories than to family farms in the North. But in many other respects, including methods of production or the comparison of slaves to machinery, plantations were fundamentally different from factories. The analogy between plantations and factories, it would appear, served the rhetorical purposes of the historians who introduced it, and subsequently those of economic historians studying the relative efficiency of slave agriculture (Fogel and Engerman 1974). However, Olmstead and Rhode argue that the analogy obscures more than it reveals and is, in any case, misleading as an organizing principle in studying the economics of American slavery. Within agriculture, and certainly between agriculture and manufacturing, enterprises varied greatly in their design and operation so as to maximize profit while producing fundamentally different goods under widely different environmental and institutional conditions (for example, with and without slaves). The variety and flexibility of enterprises defy easy analogies made across sectors, such as "factories in the fields."

Concluding Remarks and Suggestions for Further Research

In summary, the chapters in this volume make contributions to the scholarly literature in three areas. The first is the economic history of corporate governance. Lamoreaux (chapter 1) shows that the process by which state law pertaining to business organization came into being was long and pro-

tracted, reflecting fundamental and persistent trade-offs between equity and efficiency concerns. Hilt (chapter 2) shows that the diffusion of the corporate form was connected to the spread of mechanized (steam) factory production in manufacturing. Bodenhorn and White (chapter 3) document how various features of internal governance changed over time in American banking, using New York as a case study.

Second, the volume contributes to the literature on the historical behavior of financial enterprises and the growth of credit markets. Atack, Jaremeski, and Rousseau (chapter 4) show that the diffusion of the rail network, one of the central technological and infrastructure improvements of the nineteenth century, appears to have contributed to a better functioning and more stable banking system, an important external economy of the transportation revolution. This chapter also demonstrates that the internal behavior of enterprise (banks in this case) could be shaped by external forces other than just legislation and regulation. Hansen's pioneering and creative use of bankruptcy records (chapter 5) shows that, even in a place as remote as Mississippi in the 1930s, long-distance debtor-creditor relationships existed. For the key sector of manufacturing, however, the use of long-distance credit networks was relatively uncommon and relatively few loans originated from banks.

Third, the volume contributes to the literature on scale economies in production in the nineteenth century. In the case of manufacturing, the incentive to reap profit by exploiting scale economies was surely a major impetus behind the evolution of state legislation on incorporation; as Hilt shows, the corporate form was adopted disproportionately in industries with larger than average size and greater use of steam power. Robert A. Margo (chapter 6) revisits the analysis of the key evidentiary bases for prior studies of economies of scale in nineteenth-century manufacturing, the federal censuses, shows that the evidence from this source is fragile, and suggests that economic historians need to look elsewhere to bolster the conventional wisdom. Alan L. Olmstead and Paul W. Rhode (chapter 7) revisit another iconic example of scale in the nineteenth century, large slave plantations. They show that analogies to factory production, so-called "factories in the field," are not particularly helpful in understanding how these historically important enterprises operated.

A book of this nature, consisting of original research papers on a diverse but clearly related set of topics, cannot attempt to review and synthesize the literature on all aspects of American economic enterprise. It does attempt to provide multifaceted and interconnected accounts of how businesses, banks, and credit markets promoted the transformation of the American economy through the lens of how these enterprises were organized and operated. In this sense, the studies presented here and others like them illuminate a layer of economic history that rests beneath more than the abstract aggregates of macroeconomic growth accounting.Many opportunities for future research could build upon the studies that comprise this volume. For instance, our understanding of the political economy of incorporation statutes would

be enhanced by additional case studies beyond Lamoreaux's investigation of Pennsylvania. Economic historians have much to learn about the causal effects of the organizational innovations elucidated by Hilt and by Bodenhorn and White in their investigations of manufacturing firms and banks, respectively. Atack, Jaremski, and Rousseau's exploration of the impact of the diffusion of railroads on the stability of the banking system raises the obvious question as to whether later technological innovations had similar or very different effects. Hansen's fascinating window on what one can learn about creditors and borrowers from bankruptcy records begs to be extended to a broader geography and to other economic times. Finding out precisely how and why production differed in small versus large enterprises in the nineteenth century, be it in manufacturing (Margo) or agriculture (Olmstead and Rhode), requires that economic historians bring new data and methods of analysis to the table. In all cases, further excavation of the history of American enterprise promises to yield a better understanding of the origins, distinctive and otherwise, of American economic development.

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