(Preliminary Draft – Comments Welcome)

Corporate Governance and the Development of Manufacturing Enterprises in Nineteenth-Century Massachusetts

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Abstract: Using newly collected data, this paper analyzes the use of the corporate form among nineteenth century manufacturing firms in Massachusetts. Beginning in the 1870s the state required all manufacturing corporations to submit certificates of condition to the state, which listed their managers and owners. These records are used to compute measures of managerial ownership and ownership concentration, and are matched to the state manufacturing census of 1875 to calculate incorporation rates across industries. Although historians have emphasized the pioneering role of the great textile corporations in Massachusetts, the data indicate the corporate form was adopted among firms in a wide range of industries, and by firms of varying sizes. Most manufacturing corporations were quite closely held, with ownership concentrated among management, although managerial ownership declined with firm size. Among the small number of very large corporations whose shares were traded on the Boston Stock Exchange, ownership was quite diffuse, with extremely low levels of managerial ownership.

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1. Introduction

The development of large-scale, integrated textile mills in New England in the first quarter of the nineteenth century marked a turning point in the industrialization of the United States. Over the course of the ensuing decades, the production methods adopted and refined by the so-called Waltham-Lowell mills were reproduced among growing numbers of firms throughout the region, and helped develop one of America's most important nineteenth-century industries. But in addition to the new technologies and production techniques they adopted, these firms introduced significant *organizational* innovations. The Waltham-Lowell mills were organized as corporations, and raised as much as $1 million or more each from hundreds of investors. The business corporation was of course not new, but it had never been used to create such large industrial enterprises in the United States. These firms were generally owned by a diffuse base of passive outside shareholders, and operated by managers who were themselves not significant owners: in the language of Berle and Means (1932), ownership was divorced from control.

The great textile corporations of New England are frequently used to analyze the early development of the corporation and the evolution of corporate ownership. But whether these enterprises were representative of early manufacturing firms, or an exceptional class of corporations with their own unique ownership structures and governance institutions, is unclear. As the nineteenth century progressed, New England's industrialization spread well beyond textiles, and many different manufacturing industries emerged and developed. Many of the firms in these industries also adopted the corporate form on a large scale. Were other manufacturing corporations organized or owned in the same way that the Waltham-Lowell firms were? Scholarship focused on the textile industry had argued that the Waltham-Lowell mills were radically different in their organization from the textile mills of Philadelphia (Scranton, 1983)—was this also true of other industries?

Using newly collected data, this paper analyzes the ownership and governance of all manufacturing corporations in Massachusetts in 1875, a time when the cumulative effects of the industrialization of the state were quite evident. The data were obtained from the certificates of condition that the state required all business corporations to file annually, beginning in that decade. The certificates list the directors and stockholders of the firms, and present basic accounting data and other information. The data reveal the extent of the use of the corporate form across industries, as well as *how* it was used: the extent of managerial ownership, the degree of dispersion of shareholdings, the size and composition of boards of directors, and how these measures varied across industries and among firms of different sizes.

Nineteenth century manufacturing corporations faced two interrelated problems in their governance.[1] The first was managerial opportunism—this is the familiar consequence of the separation of ownership from control, in which managers who are unaccountable to the owners act in self-interested ways which harm the owners' interests. The second was minority oppression—this occurs when a controlling shareholder is able to utilize the firm's resources for his own benefit, again at the expense of the other investors. A firm with very large numbers of owners and a low degree of managerial ownership was likely to face the problem of managerial opportunism. Firms with at least one large blockholder would be unlikely to suffer from this problem: the blockholder would have the power to oust managers who acted opportunistically. On the other hand, the blockholder could potentially exercise dictatorial control over the enterprise, and operate it in self-interested ways. This latter problem was a particular source of concern among early American corporations (Hilt, 2008). When firms chose to adopt the corporate form, they had to find ways to minimize these problems. For some firms, the greater flexibility of the partnership form in configuring the firm's governance may have outweighed the potential benefits of the corporation for raising large amounts of capital. For others, the

[1] See the discussion in Lamoreaux (2009) and Lamoreaux and Rosthenthal (2006) for detailed explorations of these issues.

corporation may have represented a constrained optimum (See Lamoreaux and Rosenthal, 2006).

In this paper I analyze the utilization of the corporate form, and the likelihood that different enterprises suffered from these problems. I proceed in three steps. First, I analyze the adoption of the corporate form across industries. Using business directories, I am able to classify nearly all Massachusetts manufacturing corporations into industry categories that correspond to those of the 1875 Massachusetts state census. As the state census lists the total number of firms in each industry, I can calculate incorporation rates as the ratio of total corporations to total firms in the industry. I also use the census data to analyze the correlation between average firm size (measured by capital, employees, and the rate of use of steam power) and incorporation rates at the industry level. Perhaps unsurprisingly, the data reveal that incorporation rates were higher among industries with firms that were larger by these measures. However, the data also reveal some industries with relatively small firms and substantial incorporation rates. There were indeed some very small incorporated firms.

I then analyze the ownership and governance of the corporations, and calculate a variety of related statistics. The data indicate that the degree of ownership dispersion in general and managerial ownership in particular varied widely across industries. Among industries with larger corporations, managerial ownership tended to be lower. But the data reveal that the great textile mills of Massachusetts were rather atypical of the state's industrial corporations: they were far larger, and had greater numbers of shareholders and lower degrees of managerial ownership than even their large sizes would imply. The extent of the separation of ownership from control among those firms was highly unusual. In general the data indicate that entrepreneurs were able to use the flexibility of Massachusetts' corporation law to configure their enterprises in a variety of ways, according to their needs and circumstances.

Today, we know that large American corporations are unusually widely held, relative to those of other countries (La Porta et al, 1999). The data presented in this paper suggest that the

Massachusetts textile corporations traded on the Boston Stock Exchange in the nineteenth century were 'widely held' by the definitions of the modern literature at even higher rates than those of modern American publicly traded corporations. The data also, however, suggest that the Boston Stock Exchange corporations were quite unusual relative to most industrial corporations of their time, and ownership was typically quite concentrated.

Finally I investigate the relationship between managerial ownership and a rough estimate of firm values, for the publicly traded corporations in the sample. Consistent with the notion that the problem of managerial opportunism was mitigated by ownership incentives, the results indicate that higher levels of managerial ownership were associated with higher firm values. But these results hold only for the small number of firms for which stock prices can be found, and may not generalize to the average firm in the sample.

This paper contributes to three interrelated literatures. First, it complements the large and growing literature on the development of manufacturing industries and enterprises in New England (see, for example, Temin, ed., 2000). Much of this work has focused narrowly on the textile industry, and the very large corporations that were formed within that industry (for example, Ware, 1931, and McGouldrick, 1968). This paper presents a more comprehensive account of manufacturing firms in Massachusetts, and their use of the corporate form. The data reveal that in the third quarter of the nineteenth century, the corporate form had been adopted on a large scale among firms in a very broad range of industries.

Second, the paper contributes to a growing literature on the history of corporate ownership. Berle and Means' (1932) highly influential account argued that in early industrial corporations, the shareholders actively participated in the governance of the enterprises, and ensured that managers performed their roles well. Their work has enjoyed broad acceptance in the literature.[2] This paper presents a wealth of new data on the extent of the separation of

[2] See, for example, Dodd (1938), Hovenkamp (1991) and Coffee (2001). An important exception is Werner (1986).

ownership from control among nineteenth century corporations in Massachusetts, and shows that the account of Berle and Means is somewhat misleading. Although some early corporations were indeed closely held by shareholders who likely participated actively in annual meetings, a great many more were owned by large numbers of passive shareholders.

Finally, the paper also contributes to the literature on the adaptability of the corporate form to the needs of small- and medium-sized enterprises (SMEs). Recent contributions to this literature have argued that the corporation laws of American states were quite rigid and regulated governance institutions in ways that were unattractive to SMEs, and that innovations in the menu of organizational forms available to American firms in the later twentieth century, such as the Limited Liability Company (LLC), created alternatives that were vastly superior to the corporation for the needs of SMEs (Guinnane et al, 2007). The results of this paper suggest that there was considerable flexibility in the corporation law of Massachusetts, and that entrepreneurs were able to utilize this flexibility to adapt the corporate form into a wide range of enterprises.

2 The Massachusetts Legislature and Corporation Law, 1790-1850

As in most American states, during the first half of the nineteenth century the corporate form was not freely available to entrepreneurs in Massachusetts. Instead, incorporation was only possible if the state legislature passed a law granting a charter to a business. These 'special act charters' were probably not accessible to entrepreneurs who lacked a fair measure of legal sophistication and financial resources. Nonetheless, over the first half of the nineteenth century, Massachusetts granted charters to nearly 550 manufacturing firms. The terms of these charters were initially restrictive in some respects, but they quickly became quite liberal, particularly with regard to the internal governance of the firms they created. This flexibility was

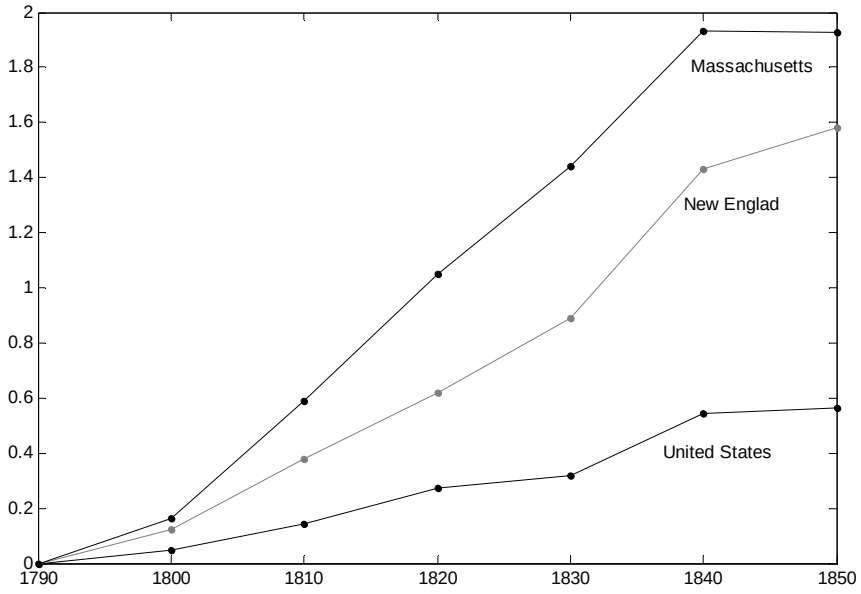

Figure 1: Cumulative Corporate Charters per 1,000 Persons
Sources: Corporate charters from Sylla and Wright (2013); population figures from the decennial federal census. Note: The data do not include corporations created through general acts

unusual, relative to the terms of other states' corporation laws, and may have contributed to the heavy use of the corporate form in Massachusetts.

Beginning in the Early National period, the state government actively used the law to promote economic development, offering public support to private enterprises that would furnish transportation infrastructure or develop the capacity for manufacturing (see Handlin and Handlin, 1974). When entrepreneurs sought charters to incorporate manufacturing businesses, they were generally accommodated. As the state industrialized and new companies proliferated, demand for corporate charters grew rapidly, and the state showed a clear willingness to meet that demand. In the first half of the nineteenth century, Massachusetts granted the highest number of corporate charters of all the American states and territories. Figure 1 presents the charters granted by the state in a comparative perspective. By 1850

Massachusetts had granted more than twice the number of corporate charters relative to its population than the national average.

Especially in the period before 1830, however, these charters often did not contain all the terms sought by entrepreneurs. For example, the petition for the Boston Manufacturing Corporation, the firm that would become the first to create an integrated cotton mill, sought banking powers for their enterprise, which were refused (McGouldrick, 1968). The success of that firm and the other Waltham-Lowell mills that followed under the terms of the charters they were granted demonstrated that banking powers were unnecessary. Yet those firms' charters lacked another important power that was routinely granted to manufacturing incorporations in other states: limited liability for the shareholders. The state refused to grant limited liability to any manufacturing corporation in the 1810s and 1820s. All charters granted to such enterprises explicitly made shareholders subject to an 1809 statute, which made them personally liable for their firms' debts.[3] When it was later objected that shareholders could circumvent this provision by selling their shares to "men of straw," the legislature strengthened its requirement of individual liability by passing legislation that made shareholders liable for any debts incurred while they were shareholders, *even if they subsequently sold their shares*.[4] Yet in spite of this restriction, manufacturing enterprises sought to incorporate in Massachusetts at very high rates; from 1800-1809, 15 charters were granted to manufacturing enterprises, and from 1810-1819, 133 were granted. In the 1820s, another 146 were granted.[5]

The burden of unlimited liability for shareholders ultimately came to be perceived by many to be limiting economic development. In 1829, a year of high numbers of business failures, the personal liability of many households owning corporate stock led to "wide

[3] This general regulating act for manufacturing companies to some extent standardized many of the terms in subsequent charters, and helped reduce the scope for special privileges to be granted in particular charters. *Massachusetts Laws*, 1809, ch. 65. The special privileges granted to some very early Massachusetts manufacturing corporations, ranging from lottery tickets to grants of land, are described in Davis (1917).
[4] *Massachusetts Laws*,1822, ch. 38.
[5] *Massachusetts Senate Documents*, 1836, no. 90.

spreading and irretrievable ruin to individuals."[6] Ultimately the governor, Levi Lincoln, took up the cause and despite the vigorous opposition of some influential merchants, a new law granting limited liability to manufacturing enterprises was passed in 1830.[7] This law, a "general regulating act" that dictated virtually all of the terms of subsequent manufacturing charters, stated that the shareholders of these enterprises would have unlimited liability for debts until their capital subscriptions were fully paid-in, at which point their liability would be limited to the amount of their shares. The act included various other safeguards for the creditors of corporations, for example limiting total indebtedness, and prohibiting the payment of dividends from the capital stock or loans to stockholders.

The 1830 act did not, however, include any terms relative to the governance of the corporations subsequently created, other that imposing the requirement that each corporation have a president, a clerk, a treasurer, and at least three directors. The voting rights of the shareholders, and their method for choosing these officers, were left to the corporations themselves to decide. The silence of the law on these issues was quite unusual; most states' early corporation laws strictly regulated director elections and shareholder voting rights (Hilt, 2013). All subsequent manufacturing charters were quite brief, stating only the name of the firm, the nature of its operations, and the size of its capital stock, and then simply indicating that the firm was subject to the 1830 act. In the 20 years between 1830 and 1850, Massachusetts granted more than 400 charters to manufacturing firms.[8]

Finally, in 1851 Massachusetts took the important step of passing a general incorporation act for manufacturing enterprises.[9] Rather that applying to the legislature for a charter, the act provided that any three people could form a corporation, in virtually any manufacturing or mining industry, by simply filing the certificates required in the act with the Secretary of the

[6] Governor's message, January 1830, in Massachusetts Resolves, 1830.
[7] *Massachusetts Laws*, 1830, ch. 53.
[8] Author's calculations from the charters themselves, obtained from *Massachusetts Laws*, 1830-1850.
[9] *Massachusetts Laws*, 1851, ch. 133.

Commonwealth and with their county.[10] Following the precedent of the 1830 general regulating act, the 1851 general incorporation act was mostly silent regarding the internal governance of the corporations, beyond requiring that the firms have a president and a treasurer—the act did not even specify a minimum or maximum number of directors. The act required that corporations created through its terms have a minimum of $5,000 in capital, and also imposed a maximum of $200,000, which was far smaller than the capital of many chartered corporations. The legislature thus intended the statute to serve as an alternative route to incorporation for small firms, while still requiring large firms to seek charters from the legislature. In 1855, the maximum capital permitted for corporations formed under the general act was raised to $500,000, but the legislature continued to retain control over access to the corporate form for extremely large enterprises.[11]

The 1851 general act imposed one significant burden on the corporations created through its terms that chartered corporations were not subject to. And that was an annual report, known as a certificate of condition, which stated the names of the officers and shareholders, and provided other basic information.[12] But in 1870 the state formally imposed a requirement that a more detailed certificate of condition be submitted annually by all industrial corporations in the state, whether they were chartered or incorporated through the general act. These certificates of condition form the basis for the data analyzed in this paper.

3 The Adoption of the Corporate Form in Massachusetts

The corporate form was utilized with great frequency, but many multi-owner firms of course remained unincorporated, effectively choosing to remain partnerships. Which firms actually incorporated? Many of the privileges of incorporation should have been most attractive

[10] Massachusetts was relatively late to adopt a general incorporation act; see Hilt (2013) for a comprehensive tabulation of general incorporation acts for manufacturing firms.
[11] *Massachusetts Laws*, 1855, ch. 68.
[12] Unfortunately, the certificates of condition submitted prior to 1870 do not survive.

to large firms seeking to raise capital from large numbers of investors. For example, the transferability of shares, the governance structure of a board of directors to whom control over day-to-day management would be delegated, and the limitation of personal liability for shareholders would all seem to be well suited to the needs of outside investors. For a firm with a small number of owners, who were perhaps from the same family, the formalities of an annual meeting and director elections, and the requirement of detailed annual disclosures, probably represented a substantial nuisance. On the other hand, the corporation laws of Massachusetts were relatively flexible, and effectively permitted incorporators to configure their enterprises' voting rights and decision making procedures as they wished. Did small firms, or firms with small numbers of owners, actually incorporate?

One way to address these questions is to examine the industries in which firms chose to incorporate at high rates, and compare them to industries in which incorporation was uncommon. Calculating rates of incorporation, or identifying incorporated firms within published census records, is generally difficult or even impossible, since early censuses did not record the organizational form of the firms they enumerated. However, the detailed records of corporations from Massachusetts offer an opportunity to compare corporations to other firms within the same industry. The state's manufacturing censuses reported detailed information on the total numbers of establishments, their capital, and their employees, by industry. These records can be compared to the filings of manufacturing corporations, whose certificates of condition stated their capital and other information. The certificates unfortunately do not specify the industry of the corporation or its products or revenue. However, the corporate names (eg., "Bay State Faucet and Valve Company") often provide a relatively clear indication of the firm's industry. For those with names that do not provide identifying industrial information (eg., "Paul Whitin Manufacturing Company") contemporary business directories were used to

classify most corporations into the categories of the state census.[13] The earliest year for which totally comprehensive corporation records are available, and a manufacturing census is available, is 1875.[14] In that year, the manufacturing census listed more than 10,000 manufacturing establishments in Massachusetts, and the certificates of condition of 601 corporations could be classified into the industrial categories of the census.[15]

The resulting data are presented in Table 1.[16] The data in the table show quite clearly that incorporation rates differed radically across industries. Several of the state's largest industries (measured by the number of establishments), such as boots and shoes, clothing, food preparations, and printing and publishing, had very few incorporated firms at all, and vanishingly low incorporation rates. At the other end of the spectrum, there were smaller industries with relatively small numbers of establishments, such as chemicals, glass, jute baggings, and textile printing ("print works"), where the corporate form was quite dominant. The various categories within the textile industry, as expected, had large numbers of corporations and relatively high incorporation rates. But there were also relatively large numbers of incorporated firms producing machinery, metallic goods, paper, and brick and stone.

The data in the table also seem consistent with the notion that incorporation rates were higher in industries with higher average capital per firm. The industries with the smallest

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[13] In particular, the *Massachusetts Register and Business Directory* (1878) and the *New England Business Directory and Gazetteer* (1877) were consulted, along with directories of individual towns. The industries of 11 of corporations could not be identified and were excluded from the analysis.

[14] The collection and analysis of the data for the 1875 census was overseen by the chief of the Massachusetts Bureau of Statistics of Labor, Carroll D. Wright, who would later become the U.S. Commissioner of Labor and oversee the 1890 Federal Census. The 1875 Massachusetts Census was designed and implemented using relatively sophisticated methods, and represented a substantial improvement over earlier state censuses. See Wright (1877).

[15] The state census did not require a minimum for revenues or size for establishments to be included in the census (Wright, 1877: 103). However, excluded from these data are around 11,000 firms engaged in "occupations," rather than manufacturing. These occupations included blacksmithing, coopering, butchering, painting, sewing machine repairing, fish curing, butchering, cobbling, tinsmithing, roofing, plumbing, and related tasks. These firms had been classified as engaged in manufacturing in earlier state censuses.

[16] The average capital of all establishments, column (2) in the table, is calculated by dividing total capital in the industry by the number of establishments. There is not sufficient data to calculate median capital from the census data. The table excludes a small handful of industry categories with very few firms.

Table 1:
Establishment Size and Incorporation Rates: Industry Averages, Massachusetts, 1875

(Panel A)

	All Establishments		Corporations		
	N	Average Capital	*N*	Average Capital	Incorporation Rate
	(1)	(2)	(3)	(4)	(5)
Clothing					
Boots and Shoes	1,461	12,795	12	125,707	0.01
Dress Trimmings	7	21,064	1	60,000	0.14
Other Clothing	1,088	8,442	23	202,174	0.02
Food and Tobacco					
Food Preparations	783	12,580	16	175,875	0.02
Liquors and Beverages	155	26,802	1	150,000	0.01
Tobacco	264	3,076	4	14,088	0.02
Instruments					
Clocks and Watches	14	132,425	3	588,533	0.21
Scientific Instruments and Appliances	52	8,244	7	107,382	0.13
Musical Instruments and Materials	71	54,163	8	122,363	0.11
Metals, Metallic Goods, and Machinery					
Agricultural Implements	38	30,118	6	190,833	0.16
Arms and Ammunition	20	48,215	1	9,398	0.05
Artisans' Tools	124	17,956	12	118,133	0.10
Machines and Machinery	311	44,565	69	157,666	0.22
Other Metals and Metallic Goods	768	28,526	87	171,375	0.11
Oils and Chemicals					
Chemical Preparations	9	34,644	8	89,076	0.89
Fertilizers	9	136,722	2	218,000	0.22
Oils and Illuminating Fluids	33	69,311	7	112,929	0.21
Paper and Paper Goods					
Paper	120	90,502	38	119,314	0.32
Printing and Publishing	533	12,033	11	69,755	0.02
Textiles					
Carpetings	24	160,665	6	520,567	0.25
Cotton Goods	220	290,203	107	449,478	0.49
Linen	5	184,800	2	550,000	0.40
Print Works	9	285,556	5	185,200	0.56
Silk	6	81,333	1	120,000	0.17
Woolen Goods	183	94,044	32	198,005	0.17
Other Textiles	28	169,700	15	140,173	0.54

Table 1, Continued:
Establishment Size and Incorporation Rates: Industry Averages, Massachusetts, 1875

(Panel B)

	All Establishments		Corporations		
	N	Average Capital	*N*	Average Capital	Incorporation Rate
	(1)	(2)	(3)	(4)	(5)
Vessels and Carriages					
Carriages and Wagons	356	6,777	1	84,000	0.00
Vessels	163	5,733	1	350,000	0.01
Wooden Goods					
Furniture	294	16,836	6	237,807	0.02
Lumber	579	4,697	7	35,971	0.01
Other Wooden Goods	460	9,728	10	67,975	0.02
Other Industries					
Glass	13	119,615	8	247,963	0.62
Jute	6	72,833	3	119,000	0.50
Leather	495	16,969	10	164,110	0.02
Rubber	15	119,180	4	115,000	0.27
Brick and Stone	151	11,020	30	119,194	0.20
Miscellaneous					
Miscellaneous Manufactures	1250	21,396	37	113,103	0.03

average firm capital, such as tobacco, lumber, vessels, and carriages and wagons, all had incorporation rates of 2 percent or less, whereas those with the highest firm capital, such as cotton goods, textile printing, linen, and "other textiles," all had incorporation rates of more than 40 percent. The data in Table 1 also indicate that in all but one industry, the average capital of corporations was larger than the average capital of all establishments, sometimes by as much as a factor of ten. In at least a few cases, it seems very likely that the corporations were effectively operating in a different industry, even though according to the rough classification system of the census they were grouped into the same category.

How consistent is the relationship between average firm size and incorporation rates at the industry level? An analysis of the relationship between firm size and incorporation rates across industries is presented in Figure 2. The scatterplot in the top panel figure indicates that

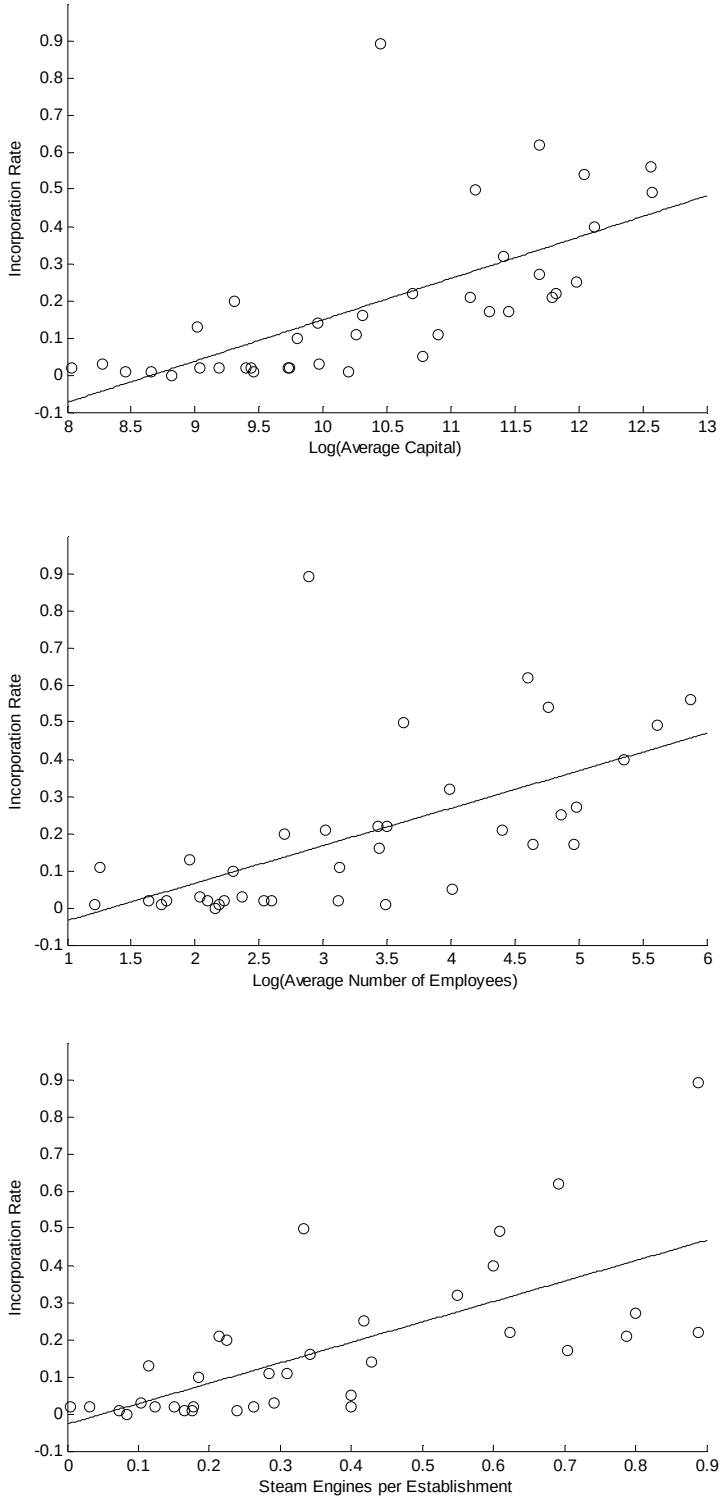

Figure 2: Incorporation Rates and Firm Characteristics by Industry

industries with higher levels of capital per firm (in logs) indeed had higher incorporation rates. The regression line included in the figure clearly illustrates the strong tendency towards higher incorporation rates among firms in industries with higher average capital. However, the residuals of many industries are also high, and in particular, there are several industries with relatively high incorporation rates and relatively low levels of average capital.

The 1875 Massachusetts census offers additional industry-level data which provide greater insight into the operations of the firms in different industries. The middle panel of Figure 2 plots the log of the average number of employees per establishment against incorporation rates. And the bottom panel plots the average number of steam engines per establishment against incorporation rates. The figures show that there is a strong correlation between incorporation rates and both employees per establishment and steam engines per establishment. Industries with high levels of capital, some of which was likely to take the form of a steam engine, and also high levels of employees, tended to have a greater proportion of their firms adopting the corporate form.

It is worth noting that if the adoption of the corporate form enabled firms to increase their scale or adopt steam power, relative to what was attainable as a partnership, then these results suggest that the corporate form may have increased productivity. Using data from the federal census, Atack, Bateman and Margo (2008) find strong productivity gains associated with the adoption of steam power, and that these gains were increasing in firm size.

4. Ownership and Governance of Massachusetts' Corporations

How well governed were these enterprises, and how likely were they to have suffered from managerial opportunism or minority oppression? The historical record indicates that among the very large textile corporations in the state, the problem of managerial opportunism appears to have been a source of some concern. In at least one case, problems related to the

tactics employed by managers to perpetuate their control over diffusely held enterprises caused the legislature to enact a statute intended to protect the interests of small investors. The circumstances surrounding the enactment of this change provide some insight into how corporate governance actually functioned at the time, and in particular, highlight some of the problems faced within the large textile corporations.

There is a long tradition of sophisticated merchants expressing skepticism that the managers of corporations would be capable of performing as well as those who operated on "an individual basis." For example, Henry Lee, a Boston merchant, complained in his correspondence that many major textile corporations were "in danger of being ruined by extreme salaries and high wages in all the departments," a problem he attributed to weak performance incentives by managers (Porter, 1937: 125). But the most clear and direct evidence of managerial opportunism is found in the early 1860s, when an activist investor named J.C. Ayer initiated a campaign to reform the governance institutions of the major textile corporations. He produced a pamphlet, *On the Usages and Abuses in the Management of Our Manufacturing Corporations* (1863) that argued that managerial opportunism by directors was rampant: they engaged in self-dealing in their transactions with firms to whom the purchase of raw materials or the sale of finished products were delegated, and paid excessive fees; they hired their relatives for important supervisory positions; they drew excessively high salaries; and they concealed the effects of these practices from the shareholders. Ayer specifically argued that "relations of owners and managers" had changed since the founding of the companies, since the existing owners were completely passive, and bought their shares "in the hope that somebody interested in it can and will take care of it." He also argued that the directors perpetuated their control over their firms by soliciting proxy votes from the shareholders through duplicitous means, and, where necessary, by holding the annual meetings of companies with many shareholders in common simultaneously, thereby preventing the larger shareholders from participating in more than one.

Although it is impossible to verify many of Ayer's claims, it is possible to discern the level of shareholder participation in annual meetings for at least a handful of companies, and thereby assess whether or not the scope for managerial opportunism was as broad as Ayer claimed. And indeed it does appear to be the case that stockholders participated in annual meetings only infrequently.[17] The Massachusetts legislature responded to the complaints of Ayer and other stockholders by enacting a statute in 1865 intended to limit the power of directors to utilize proxy votes to perpetuate their control.[18] In particular, the statute limited the number of proxy votes that a sitting director could exercise to 20, a very small fraction of the total of around 1,000 shares that were typically outstanding.

4.1 Ownership structures of manufacturing companies

How widespread was this problem likely to have been? Managerial opportunism is most likely to become a problem under highly diffuse ownership. Therefore Panel A of Table 2 presents data on the ownership of all manufacturing corporations in the state, which gives a clear sense of the diversity of corporate sizes and ownership structures. The average manufacturing corporation had around $210,000 in paid-in capital, and 47 shareholders. It had a relatively small board consisting of four directors, who owned around 45 percent of the shares. Its ownership was relatively concentrated the standards of modern public companies, with the largest investor holding 28 percent of the shares. By the definition of La Porta, et al (1999), only about 42 percent of Massachusetts' corporations were 'widely held,' in the sense of not having a 20 percent owner. But the data also reveal that the mean values of firm capital and total shareholders were considerably higher than the median values, reflecting the influence of some very large firms. The median firm had less than half the mean values of total capital and total shareholders, although the degree of ownership concentration was roughly similar. These

[17] For example, between 1850 and 1875, the number of stockholders in the Pepperell Manufacturing Company grew from 117 to 321 . At the annual meetings during that period, the number of stockholders present generally ranged from 10 to 25 (Knowlton 1948: 16). See also McGouldrick (1968).
[18] *Massachusetts Laws*, 1865, ch. 236.

Table 2:
Ownership of Manufacturing Corporations

	Mean	Median	SD	Min	Max
A. All Manufacturing Corporations					
Total paid-in capital	210,638	100,000	323,753	1,000	2,500,000
Total shareholders	47	18	87	2	730
Board size	4.06	4	1.44	2	13
Percent owned by directors	0.45	0.44	0.29	0.01	1
Percent held by largest shareholder	0.28	0.24	0.21	0.01	0.99
Widely held	0.42	0	0.49	0	1
B. Manufacturing Corporations Traded on Boston Stock Exchange					
Total paid-in capital	912,742	750,000	589,363	100,000	2,500,000
Total shareholders	261	237	182	60	730
Board size	4.90	5	1.08	3	7
Percent owned by directors	0.10	0.07	0.06	0.02	0.26
Percent held by largest shareholder	0.07	0.05	0.07	0.01	0.36
Widely held	0.97	1	0.18	0	1

data suggest that minority oppression, rather than managerial opportunism, was likely to have been an important problem for the majority of manufacturing corporations at the time.

Panel B of Table 2 presents the same statistics for the 31 manufacturing corporations in the sample whose shares were traded on the Boston Stock Exchange.[19] Those firms included most of the great Waltham-Lowell textile mills, as well as a few other major industrial firms from other regions in the state. Contrasting these public firms with the average firms in the state therefore provides a sense of the representativeness of Massachusetts' great textile firms. The data in Panel B reveal that the Boston Stock Exchange firms were quite unusual. Their

[19] *Martin's Boston Stock Market* indicates that in 1875, the stocks of around 44 New England manufacturing companies were traded regularly on the Boston Stock Exchange. Among those 44, at least 11 were located in other states. See Atack and Rousseau (1999) on the performance of Boston Stock Exchange traded shares during this period.

capital was more than fourfold greater than average, and their numbers of shareholders were fivefold greater. Ownership by management was less than one fourth that of the average corporation, as was the size of the largest stake held. These were huge corporations with an extraordinary degree of diffusion in their ownership.

A more detailed portrait of the structure of ownership of manufacturing corporations is presented in Table 3, which shows averages for each industry group where there was more than one operating corporation. The data in the table indicate that in nearly every industry, managerial ownership was on average quite significant, and typically the largest blockholder owned more than 20 percent of the shares. Concentrated ownership was the norm, and with management owning nearly half of the shares, the problem of managerial opportunism was unlikely to have been insignificant. The managers' own stakes were likely sufficiently large so that they would at least partly internalize the costs associated with shirking or taking other actions harmful to the performance of the firm. On the other hand, their stakes were often sufficiently large so that they enjoyed majority control and could not be removed from their positions by the other shareholders. This suggests that minority oppression was likely to have been a problem among a substantial portion of the corporations.

What explains the variation in ownership structures across industries? Why did some firms have much larger managerial ownership and smaller numbers of outside shareholders than others? The data in Table 3 suggest that scale played a role: in the industries with the largest average capital, the degree of ownership concentration appears to be lower. This was likely driven by the constraints of raising large sums of money—it was likely necessary in the case of very large firms for a group of founding investors to seek investments from large numbers of outsiders.

Table 3:
Corporate Ownership: Industry Averages, Massachusetts, 1875

(Panel A)

	Total Capital	Total Share-Holders	Share Owned by Directors	Largest Stake Held	Share Widely Held
Clothing					
Boots and Shoes	125,707	25	0.48	0.28	0.44
Other Clothing	202,174	64	0.42	0.24	0.43
Food and Tobacco					
Food Preparations	175,875	32	0.32	0.17	0.62
Tobacco	14,088	8	0.66	0.15	1.00
Instruments					
Scientific Instruments and Appliances	107,382	25	0.60	0.37	0.00
Musical Instruments and Materials	122,363	10	0.56	0.29	0.20
Metals and Metallic Goods					
Agricultural Implements	190,833	54	0.43	0.22	0.40
Arms and Ammunition	9,398	7	0.71	0.63	0.00
Artisans' Tools	118,133	68	0.40	0.31	0.29
Machines and Machinery	157,666	26	0.52	0.28	0.27
Other Metals and Metallic Goods	171,375	25	0.45	0.29	0.40
Oils and Chemicals					
Chemical Preparations	89,076	25	0.40	0.28	0.25
Fertilizers	218,000	30	0.41	0.41	0.50
Oils and Illuminating Fluids	112,929	27	0.52	0.21	0.40
Paper and Paper Goods					
Paper	119,314	22	0.58	0.37	0.22
Print Works	185,200	12	0.66	0.48	0.25
Printing and Publishing	69,755	18	0.72	0.42	0.17
Textiles					
Carpetings	520,567	113	0.41	0.26	0.50
Cotton Goods	449,478	100	0.41	0.27	0.53
Linen	550,000	36	0.55	0.41	0.00
Woolen Goods	198,005	39	0.54	0.31	0.28
Other Textiles	140,173	17	0.51	0.32	0.31

Table 3:
Corporate Ownership: Industry Averages,
Massachusetts, 1875

(Panel B)

	Total Capital	Total Share-Holders	Share Owned by Directors	Largest Stake Held	Share Widely Held
Vessels and Carriages					
Carriages and Wagons	84,000	6	0.91	0.39	0.00
Vessels	350,000	42	0.45	0.23	0.50
Wooden Goods					
Furniture	237,807	15	0.59	0.43	0.00
Lumber	35,971	13	0.56	0.30	0.50
Other Wooden Goods	67,975	35	0.56	0.26	0.50
Other Industries					
Glass	247,963	109	0.25	0.22	0.57
Jute	119,000	14	0.49	0.28	0.33
Leather	164,110	41	0.47	0.33	0.25
Rubber	115,000	19	0.35	0.29	0.00
Brick and Stone	119,194	31	0.44	0.31	0.43
Miscellaneous					
Miscellaneous Manufactures	113,103	29	0.36	0.20	0.61

The relationship between average firm scale and ownership across industries is explored more systematically in Figure 3. The top and middle scatter plots in the figure clearly indicate that the number of shareholders was increasing, and the degree of managerial ownership was decreasing, in the average scale of the firm. On the other hand, the bottom plot indicates that there was no clear relationship between firm scale and the size of the largest block of shares held.

Two implications of these figures are worth noting. First, they suggest that the relationship between firm scale and productivity may potentially be affected by changes in managerial incentives that occur in response to the lower levels of ownership concentration that occur among large firms. That is, beyond the usual factors associated with scale economies (or diseconomies) across industries, changes in managerial incentives may also play a role.

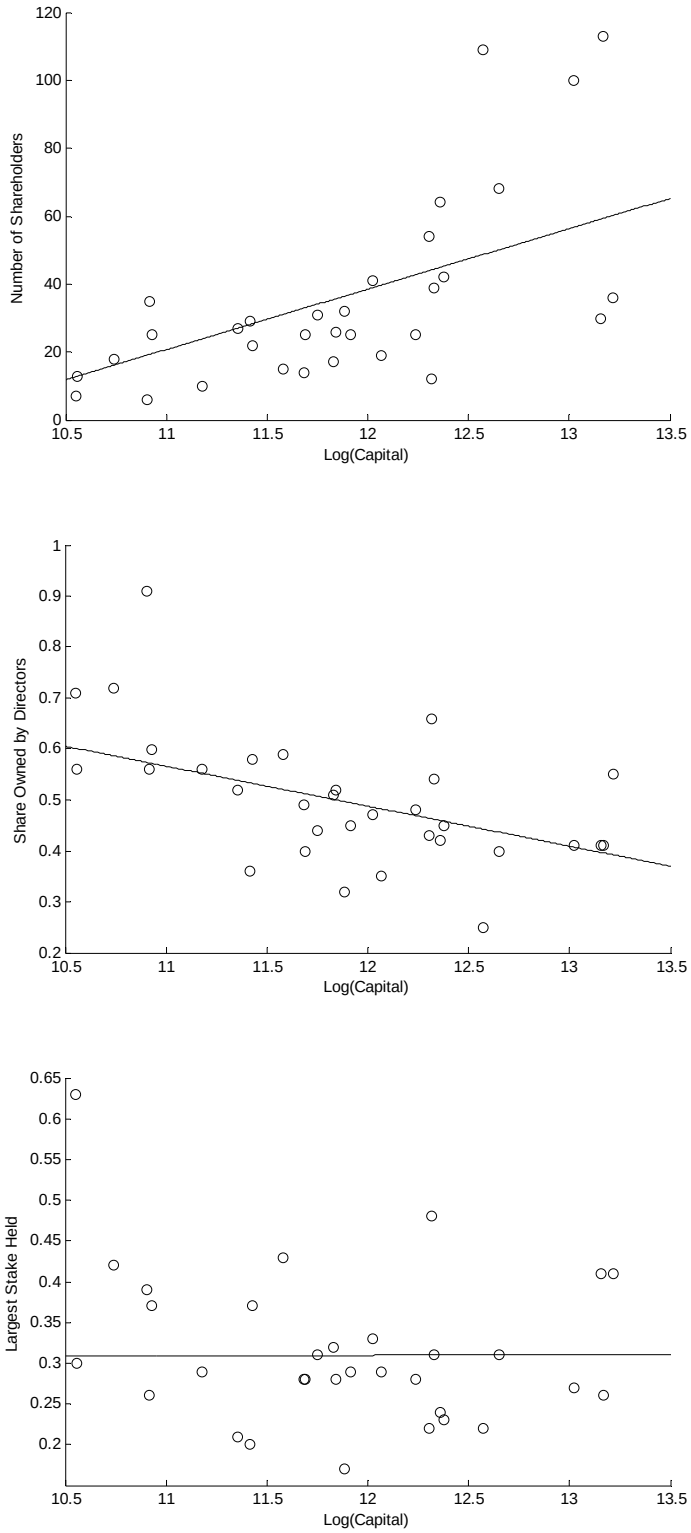

Figure 3: Firm Size and Ownership Structure by Industry

Research that compares the productivity of firms organized as partnerships with those organized as corporations has found a negative effect of the corporate form (Hilt, 2006); it may be the case that among corporations, those with weaker managerial incentives may have lower productivity than those with stronger incentives.

Second, the figures provide yet another indication of just how unusual the Boston Stock Exchange traded corporations were. The enormous scale and high degree of diffusion of ownership of those firms would literally be off the charts. But in particular, the extraordinary degree of diffusion of ownership of those companies is not explained by their scale alone—projecting the regression lines in the figures out to the level of capital of those companies would produce expected levels of ownership diffusion that were far below those actually observed.

4.2 Ownership and firm value

If a firm's ownership structure influenced the degree to which it experienced the problems of managerial opportunism or minority oppression, then ownership and firm performance should be correlated. Unfortunately, the available data on the sample corporations do not include any measures that have a clear interpretation regarding the performance of the firm. This is because the certificates of condition were designed with the interests of creditors, rather than shareholders, in mind. The forms therefore present the total values of the firms' capital, assets, and debts—which would help a creditor understand how indebted the company was. At the time, the capital stock was regarded legally as a 'trust fund' for the protection of the creditors, so a clear presentation of the capital stock itself and whether or not it had been impaired by losses was regarded as essential. The profitability of the firm, which would have been of great interest to the stockholders, was not reported. It was likely presumed that the stockholders already had access to such information at their annual meetings.

The only available measure of performance is based on stock prices. *Martin's Boston Stock Market* records the high and low prices for publicly traded companies for each year. The

ratio of these firms' market values of their equity (based on the average of the high and low values for the year) to the book values of their equity can be taken as an indication of the overall value of the firm.[20] It is available for only 24 of the sample firms—many companies have no prices listed until later years. But analyzing the variation in these data will provide at least suggestive evidence of any relationship between ownership structure and firm value among the publicly traded companies in the sample.

Before proceeding, it must be emphasized that managerial ownership, and other measures of ownership concentration, are endogenously determined. Managers of firms with strong performance may, for example, choose to hold greater stakes in their own firms. If firm scale can be taken as exogenous, then some component of ownership concentration is likely partly exogenous. But there is no way to justify interpreting regression estimates of the relationship between ownership concentration and firm value as causal. Therefore the analysis that follows is intended merely as an effort to produce regression-adjusted correlations, to see if there is at least a correlation between ownership and firm value.

Summary statistics for the 24 corporations for which market values are available are presented in Table 4. The average value of the ratio of market value to book value (M/B) is 1.2, with a median of 1.05, a minimum of 0.6 and a maximum of 2.5. Among these firms, the average total number of shareholders was 308, and the average share owned by directors was 0.08, and ranged from 0.02 to 0.18.

Of particular interest is the relationship between managerial ownership and firm value. At extremely low levels, managerial opportunism becomes likely, as the directors become effectively unaccountable to the owners. On the other hand, at very high levels, the directors can attain dictatorial powers, and take actions that benefit themselves at the expense of the other

[20] Unfortunately, unlike Tobin's Q, which is the ratio of the market value of the entire firm to the book value, this excludes the portion of the firm financed by debt. In order to calculate Tobin's Q, it is necessary to distinguish debts from surpluses and other accounts, and many companies reported these values together. In future drafts of this paper, I may experiment with using balance sheet values from later years, when the reporting was much better.

Table 4:
Summary Statistics

	Mean	Median	SD	Min	Max
Ratio of M/B	1.20	1.05	0.49	0.60	2.51
Share owned by directors	0.08	0.07	0.05	0.02	0.18
Total shareholders	308	281	189	60	730
Log(firm age)	7.52	7.52	0.01	7.50	7.53
Log(firm capital)	13.76	13.80	0.61	12.61	14.73

owners. This suggests a non-linear relationship between managerial ownership and firm value, within which low and high levels of managerial ownership would be associated with reduced firm value, whereas intermediate values of ownership would be associated with higher levels of firm values (see Morck et al, 1988). This relationship will be estimated as follows:

$$M/B_i = \alpha + \gamma_0 own_i + \gamma_1 own_i^2 + X\beta + \varepsilon_i,$$

where M/B is the ratio of a firm's market value to book value, own is the share of the company owned by management, and X is other firm characteristics, including age and size. The hypothesized relationship between ownership and value would imply that γ_0 should be positive, and γ_1 should be negative.

The results are presented in Table 5. In column (1) the M/B ratio is regressed on managerial ownership and managerial ownership squared, along with the log of firm age and the log of firm capital. The estimated parameters of γ_0 and γ_1 have the hypothesized signs, but are not statistically distinguishable from zero. Nonetheless, the estimated values imply that for the values observed within the sample, managerial ownership is positively associated with firm value; the estimated parameters would imply a negative relationship for values above 0.24, well above the maximum of 0.17 observed in the data. In column (2), an alternative measure of ownership concentration, the total number of shareholders, is included in place of the

Table 5:
Regression Results: M/B Values

	(1)	(2)	(3)
Share owned by directors	11.72		14.64+
	(8.403)		(8.064)
Share owned by directors^2	-43.53		-59.60
	(41.83)		(40.94)
Total shareholders		-0.000988	-0.00118
		(0.00100)	(0.000893)
Log(firm age)	16.28	14.71	25.43+
	(14.47)	(11.31)	(14.32)
Log(firm capital)	-0.0164	0.107	0.293
	(0.213)	(0.438)	(0.391)
Constant	-121.5	-110.5	-194.2+
	(108.4)	(86.60)	(109.0)
Observations	24	24	24
R-squared	0.162	0.094	0.221

Robust standard errors in parentheses
** p<0.01, * p<0.05, + p<0.1

managerial ownership variables, and the estimated effect is negative but extremely small, and indistinguishable from zero statistically. Finally, in column (3), both ownership measures are included, and the estimates on managerial ownership become somewhat larger, with one even becoming statistically significant at the 10 percent level.

These results provide suggestive evidence that the governance problems associated with different levels of managerial ownership may have been reflected in firm values. The results are also consistent with the complaints of J.C. Ayer about the management of some of the great textile corporations, at least insofar as they were based on problems arising from weak managerial incentives. However, it would be inappropriate to try to make inferences from these results about the rest of the manufacturing corporations in the sample. Many of those firms were small, entrepreneurial enterprises for which ownership incentives were absolutely crucial. The large textile firms clearly had their own unique governance institutions, and the observed

levels of managerial ownership and total shareholders were radically different from those of typical firms.

5. Conclusion and Epilogue

Over the course of the nineteenth century the corporate form was adopted at high rates by manufacturing firms, particularly in Massachusetts. Yet among those enterprises, there was considerable variation in scale, and in ownership structure.

On the one hand, there were the major textile corporations—the so-called Waltham-Lowell mills—which included the largest industrial firms in the state. These firms had hundreds of shareholders, most of whom held only a small handful of shares. The shares of these enterprises were traded on the Boston Stock Exchange, which provided at least some measure of liquidity. Among these firms, the degree of ownership by the board was extraordinarily low, and there were very few if any large blockholders. Although these enterprises are generally regarded as highly successful, they suffered from problems related to managerial opportunism, which is likely to occur in settings where there is a high degree of separation of ownership from control. Using a measure of firm values constructed from share prices, suggestive evidence of a positive effect of managerial ownership stakes on firm values among those firms was obtained.

Those great textile corporations, however, were quite unusual. Most nineteenth-century manufacturing corporations were smaller, had fewer owners, and a high degree of ownership by their managers. Some were indeed extremely small; around 10 percent had for shareholders or fewer. And many of these firms adapted the corporate form to their needs by creating extremely small boards of directors; 10 percent had boards of two or fewer people. Most Massachusetts corporations were controlled and operated by the men who owned them, and as a result they were much less likely to suffer from problems associated with managerial opportunism. On the other hand, minority investors within those firms risked being expropriated by controlling

shareholders. The widespread adoption of the corporate form among so many such firms suggests that incorporators were able to configure their enterprises in a way that minimized the potential costs of minority oppression, perhaps through their configurations of voting rights.

Taken together, these results indicate that the corporation laws of Massachusetts were utilized by a large and diverse range of enterprises. Although some elements of these laws were notoriously strict, in other respects they were quite flexible, particularly with regards to corporations' internal governance. One might conjecture that this flexibility contributed to the widespread success of the corporate form.

What happened after 1875? In the 1890s, several states, beginning with New Jersey, substantially liberalized their corporation laws, permitting businesses located in other states to incorporate within their borders, eliminating many restrictions on capital contributions, and enabling the formation of holding companies (see Larcom, 1937 and Grandy, 1989). For a brief period, Massachusetts' corporation laws, with their detailed annual disclosure requirements and strict limitations on corporate powers, were among the most conservative in the United States.[21] Ultimately in 1903, Massachusetts substantially liberalized its laws to reflect the "modern view that the State owes no duty to investors to look after the solvency of corporations" (Hall, 1908). With this change, the detailed data on business corporations utilized for this study ceased to be collected.

Nevertheless, it is possible to follow the evolution of the use of the business corporation in Massachusetts into the early twentieth century using data generated by the imposition and collection of the federal corporate income tax in 1909. In 1909, there were 3,637 operating manufacturing corporations in the state, with $1.013 billion in capital. This was equivalent to 1.08 manufacturing corporations and $598 in capital per 1,000 persons, relative to a national

[21] When Theodore Roosevelt became President, his first message to Congress signaled his intention to impose federal corporation laws, but reassure the business community that "supervision of corporations by the National Government need not go so far as is now the case with the supervision exercised over them by so conservative a State as Massachusetts" (Roosevelt, 1901).

average of 0.97 manufacturing corporations and $234 in capital nationally.[22] Thus Massachusetts remained a prominent center of manufacturing corporations, but it was no longer as unusual in the extent to which the corporate form was utilized as it had been in the mid-nineteenth century. As new industries and new centers of innovation emerged, and as many states revised and liberalized their corporation laws, Massachusetts was eclipsed by other states.

[22] Author's calculations from U.S. Treasury (1910) and the Federal Census. It is important to note that these data are not directly comparable to those of Figure 1, which presents the total number of corporations created in all sectors, rather than manufacturing corporations that were actually in operation.

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