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The Next Best Thing to Getting Married: Partnerships among Jewelry Manufacturers in the Providence-Attleboro Area during the Nineteenth Century

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In this study, I aim to enhance our understanding of how industrial conditions affect the choice of firm ownership structure. The Providence-Attleboro area was a center of jewelry production during the nineteenth century. Due to the differentiated nature of the product, the Providence-Attleboro jewelers needed to actively promote their products to wholesalers in distant markets. This geographical and industrial condition motivated the entrepreneurs to organize partnerships for ameliorating informational asymmetries and for mobilizing resources required to achieve economies of scale in sales and production.

"Forming a business partnership is the next best thing to getting married," according to an 1897 issue of *The Manufacturing Jeweler*, a trade journal of the jewelry manufacturers in the Providence-Attleboro area.[1] Providence, Rhode Island, together with the adjacent city of Attleboro, Massachusetts, was renowned as a major center of jewelry production

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[1] *The Manufacturing Jeweler* (18 March 1897), 180. *The Manufacturing Jeweler* began as monthly publication in 1877; it became weekly in the 1880s.

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URL: **http://www.thebhc.org/publications/BEHonline/2005/kim.pdf**.

throughout the nineteenth century. Why did *The Manufacturing Jeweler* encourage entrepreneurs to organize partnerships? Did jewelry manufacturers adopt partnerships as *The Manufacturing Jeweler* recommended? If so, was it a general phenomenon of the jewelry industry or was it specific to the Providence-Attleboro jewelers?

A partnership is a business enterprise owned by two or more persons, called copartners. Each copartner has the right to make business decisions that are binding on all the others. The copartners share profits and losses, and they bear unlimited liability on firm debt. A partnership is dissolved when any copartner withdraws his investment from the firm.[2] In the current U.S. economy, the share of partnerships in manufacturing is about 6 percent.[3] However, recent studies have shown that the share was about 30 percent throughout the nineteenth century. Although there have been some attempts to explain the popularity of partnerships during the nineteenth century, few include detailed industry studies.[4] My analysis of the jewelry industry in this paper can deepen our understanding of how industrial conditions and the choice of firm ownership structure interact.

In approaching the problem, we need to consider two alternatives that jewelry entrepreneurs could have considered: incorporating their firms or running them independently as proprietorships. Although both choices are intriguing, I focus on the latter. During the nineteenth century, the form of a corporation was limited to some very large firms, and most small and medium-size firms were either proprietorships or partnerships. This was the case for the jewelry industry. In this paper, I analyze the actual distribution of proprietorships and partnerships, rather than try to explain the absence of corporations.[5]

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[2] William T. Moore, "Partnerships," in *The New Palgrave Dictionary of Money and Finance*, ed. Peter Newman, Murray Milgate, and John Eatwell, 3 vols. (New York, 1992), 3: 121-22. A limited partnership firm can avoid the burden of unlimited liability. Although limited partnership was available during the nineteenth century, few partnership firms utilized it, making unlimited liability the rule during this period.

[3] U.S. Bureau of the Census. *Statistical Abstract of the United States: 2004-2005* (Washington, D.C., 2005), no. 718, 484.

[4] Howard Bodenhorn, "Partnership and Hold-Up in Early America," NBER Working Paper 8814 (Feb. 2002); Duol Kim, "The Popularity of Partnership in United States Manufacturing during the Nineteenth Century," working paper (2003); Naomi Lamoreaux, "The Partnership Form of Organization: Its Popularity in Early-Nineteenth-Century Boston," in *Entrepreneurs: The Boston Business Community, 1700-1850*, ed. Conrad Edick Wright and Katheryn P. Viens (Boston, Mass., 1997), 269-95.

[5] For the choice between partnership and corporation, see Naomi Lamoreaux, "Partnerships, Corporations, and the Limits on Contractual Freedom in U.S. History: An Essay in Economics, Law, and Culture," in *Constructing Corporate: History, Politics, Culture,* ed. Kenneth Lipartito and David B. Sicilia (New York, 2004), 29-65; Naomi Lamoreaux and Jean-Laurent Rosenthal, "Organizational

Theories of Partnership

In adopting an ownership structure, firm owners consider two interrelated problems. The first is how to mobilize resources, and the second is how to organize those resources optimally. Scholars studying the theory of the firm explain the choice of ownership structure in terms of the latter problem—that is, the firm's internal organizational efficiency. In their seminal paper, Armen Alchian and Harold Demsetz examined the conditions under which a partnership is adopted as an optimal ownership structure.[6] Suppose that at least two persons need to work together in a firm, but their respective contributions to production are not easy to measure by observing output alone. For example, more than one worker is needed to lift heavy cargo onto a truck. If we measure only the total weight loaded per day, it is impossible to determine each worker's marginal productivity.[7] In this situation, shirking can be prevalent among the workers. One way to resolve this problem is to have someone who specializes in directing and monitoring the workers. Although this method can resolve the shirking problem of workers, still another problem remains: who will monitor the monitor? This can be resolved by giving the monitoring person a residual claim on the firm.[8]

This theory explains why a typical multi-person firm has a hierarchical structure, and why those who control the production process, rather than the workers, own the firm. However, in some special circumstances the nature of the work itself prohibits one owner-manager from monitoring and directing the others. For example, in a law firm when many lawyers with different specialties cooperate on a legal suit, it is not easy or even possible for a monitor to measure how hard each lawyer works. This problem is also common in firms of other professionals such as medical groups or accountants. In such cases, self-monitoring under a partnership is better than adopting a hierarchical structure.[9]

Whereas Alchian and Demsetz explain the adoption of a partnership as a way to enhance organizational efficiency under severe informational asymmetry, I propose that another aspect of the choice of ownership structure problem, capital mobilization, may induce entrepreneurs to organize a partnership. Consider a skilled jewelry worker. With enough capital, he or she will be able to start a firm as a proprietor. However, without enough capital, he or she will need to get external money. If the necessary money is borrowed from a capitalist, the proprietor can still run the firm, although with debt. However, the capitalist may well worry

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Choice and Economic Development: A Comparison of France and the United States during the Mid-Nineteenth Century," working paper (2001).

[6] Armen Alchian and Harold Demsetz, "Production, Information Costs, and Economic Organization," *American Economic Review* 62 (Dec. 1972): 777-95.

[7] Alchian and Demsetz call it a "team production"; ibid., 779-81.

[8] Ibid., 781-83.

[9] Ibid., 790.

about moral hazard on the part of the manufacturer. Hence, the capitalist may want to manage the production directly. One way to do this is to hire the manufacturer. However, this, in turn, can produce an adverse selection problem—that is, more qualified manufacturers would not apply for this position. One solution is to organize a partnership.[10] If a firm can exploit economies of scale from a larger firm, but borrowing is not available due to an undeveloped capital market, entrepreneurs may implement partnerships in order to overcome capital market constraints. If the benefit from a larger firm size exceeds the organizational cost of a partnership, organizing a partnership will pay off.

Thus, informational asymmetries and difficulties in capital mobilization under the presence of potential economies of scale might have motivated jewelry entrepreneurs to adopt partnerships. We can examine the role of these two factors in the industrial conditions of the Providence-Attleboro jewelry industry.[11]

The Jewelry Industry and the Partnership

The jewelry industry consists of firms dealing with precious metals or precious stones—gold, silver, diamonds, pearls, and so forth—as their major material. Considering that design is critical for jewelry products like ornaments or silverware, most industry products can be characterized as highly differentiated goods. This property affects the structure of the industry and internal organization of the firm. On the one hand, like local

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[10] Naomi Lamoreaux proposes that promotion of clerks was an important source of the popularity of partnerships during the nineteenth century. Lamoreaux, "The Partnership Form of Organization." The promotion argument can be reinterpreted in terms of resource mobilization: the reason a young clerk accepted an employer's offer rather than independently running a firm was because he or she might not have access to enough capital to run the business. From this point of view, the promotion argument can be understood as a special case of the resource mobilization hypothesis.

[11] This discussion does not address the possibility that entrepreneurs adopted partnerships for insurance purposes. In the case of lawyers or medical doctors, their income volatility can be high due to their narrow specializations. Through a profit-sharing arrangement in a partnership, professionals can smooth their income. Martin Gaynor and Paul Gertler, "Moral Hazard and Risk Spreading in Partnership," *RAND Journal of Economics* 26 (Winter 1995): 591-613, and Kevin Lang and Peter-John Gordon, "Partnerships as Insurance Devices: Theory and Evidence," ibid., 614-29, argue the importance of this insurance motivation. Because of the differentiated nature of the products, jewelry producers also had their own specialties, and they might have organized partnerships as a way to reduce their income volatility. Although the insurance argument addresses why two professionals might organize a firm, it does not explain why they do not use a hierarchical organization. This implies that the insurance effect could be a byproduct rather than the primary motivation for organizing a partnership. Therefore, I do not include this argument; it is compatible with both hypotheses.

tailors, many local jewelry shops do both production and sales in response to customer requests. However, there are also larger manufacturers who specialize in producing and distributing products ready-made for consumers. Design development and sales promotion are important activities of these firms.

The Providence-Attleboro area was a major center of jewelry production during the nineteenth century (see Table 1).[12] In terms of number of firms or total product, the Providence-Attleboro area was the second largest production center next to New York, with 20 percent of the national output. The Providence-Attleboro producers sold their product all over the country. For distribution, instead of directly contacting customers or retailers, the jewelry producers sold their product to wholesalers.[13] Interestingly, jewelry wholesalers or "jobbers" were very rare in the Providence-Attleboro area until the 1890s. In an 1894 article with the title "Providence and the Jobbers," *The Manufacturing Jeweler* reported, "Providence is beginning to be a considerable center for jobbing jewelers. . . . Not many years ago one could count all the wholesale jewelers of this city on the fingers of one hand and have fingers to spare."[14] Instead, wholesalers were mainly based in large cities such as New York or Chicago. This seems to be because the wholesaler needed to be current on the rapid changes jewelry styles demanded. As a result, the firms of the Providence-Attleboro area usually hired salespeople and had them travel to the large cities to sell their products.

These industrial conditions might have caused Providence-Attleboro jewelers to prefer partnerships for two reasons. First, geographical separation from the wholesalers might have generated a serious informational asymmetry between salespeople and producers. Considering the highly differentiated nature of goods and the rapid changes in jewelry fashion, it

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[12] For the history of the jewelry industry, see Victor S. Clark, *History of Manufactures in the United States* (Washington, D.C., 1929); John Daggett, *A Sketch of the History of Attleborough: From Its Settlement to the Division* (Boston, Mass., 1894); George Sweet Gibb, *The Whitesmiths of Taunton: A History of Reed & Barton 1824-1943* (Cambridge, Mass., 1943); Malcolm Keir, *Manufacturing* (New York, 1928); Phillip Scranton, *Endless Novelty: Specialty Production and American Industrialization, 1865-1925* (Princeton, N.J., 1997), chap. 5; Orra L. Stone, *History of Massachusetts Industries: Their Inception, Growth and Success* (Boston, Mass., 1930); Alfred Weisberg, *Why Providence? How Did It Become the Jewelry Center of the U.S.? An Introduction to the First 100 Years* (Providence, R.I., 1992).

[13] Scranton, *Endless Novelty,* and some articles in *The Manufacturing Jeweler* report that the Providence-Attleboro jewelers tried to contact jewelry retailers directly in order to avoid excessive control by wholesalers, but such efforts were usually unsuccessful.

[14] *The Manufacturing Jeweler* (15 Nov. 1894), 511-12.

TABLE 1
Geographical Distribution of Jewelry Production in the United States, 1870

	% of Firms	% Total Product
New York	28	42
Newark, New Jersey	5	13
Providence-Attleboro	15	20
Philadelphia	7	7
Others	45	18
U.S. Total	100	100
Total No. of Firms, Total Value	681	$22,140,000

Source: *The Census of Manufactures*, 1870.

would have been difficult for a manufacturer to figure out whether low sales performance was due to the laziness or incompetence of salespeople or not. Of course, New York producers would also have suffered from this problem to some extent. However, whereas most New York producers were located together with wholesalers in southern Manhattan, along Maiden Lane and Broadway, producers of the Providence-Attleboro area had to travel almost a whole day to reach the New York wholesalers. Providence-Attleboro jewelers would have had far more severe information problems than New York jewelers had. Therefore, as Alchian and Demsetz argue, we would expect that the Providence-Attleboro jewelers might have relied more on partnerships than New York jewelers in order to ameliorate the monitoring problems involved in sales and production.

Second, firms might have organized partnerships in order to mobilize resources necessary for exploiting scale economies. Suppose that a firm needed to spend a certain amount of money per salesperson. Given this fixed cost for sales, the firm could have achieved economies of scale by increasing production. In the jewelry industry, increases in production meant that firms could make a wider range of products. Because the Providence-Attleboro firms would have had to pay more money per salesperson than New York firms due to transportation costs, lodging, or office space, the required capital for hiring salespeople and building up capacity to produce a broad product line would have been higher. At times, this could have required more financial resources than one entrepreneur would have been able to afford, and so might have led Providence-Attleboro jewelers to utilize partnerships more than New York jewelers or entrepreneurs of other industries.

Popularity of Partnerships

Before examining my hypothesis, I first determined if partnerships were really as popular among the Providence-Attleboro jewelers as *The Manufacturing Jeweler* reported. I measured the share of partnerships using a directory of jewelry manufacturers published by *The Manufacturing Jeweler*.[15] Because a proprietorship firm was usually named after the proprietor (for example, "John Adams") and a partnership firm listed names of copartners fully or in short (for example, "Adams and Baker" or "Baker & Co.,"), it is possible to identify ownership structures using the directory. Of course, there might be discrepancies between actual ownership structure and the name of the firm. However, because firms of this period generally adjusted their names promptly to reflect changes in ownership structure, this is relatively unlikely.[16]

One merit of the directory is that it comprehensively lists jewelry manufacturers of both Providence-Attleboro and New York. This allowed me to check whether the share of partnerships in the jewelry industry was higher than in other industries, or if the Providence-Attleboro jewelers had a higher share of partnerships than New York jewelers. I summarize these results in Table 2. The share of partnerships in New York was about 40 percent. Considering that average share of partnerships in manufacturing

TABLE 2
Comparison of the Ownership Structure of Jewelry Firms, the Providence-Attleboro Area and New York

	Firms of the Providence-Attleboro Area (%)			**Firms of New York** (%)
	Without New York Office	With New York Office	Total	
Proprietorship	27	11	20	54
Partnership	71	84	76	41
Corporation	3	5	4	5
Total	100	100	100	100
Number of Firms	150	118	268	304

Source: "A Complete Directory of The Manufacturing Jewelers of New England, New York & Newark," *The Manufacturing Jeweler* (Dec. 1885), 147-49.

as a whole during the nineteenth century was around 30 percent, this is slightly higher than the average.[17] However, the share in the Providence-

[15] "A Complete Directory of the Manufacturing Jewelers of New England, New York & Newark," *The Manufacturing Jeweler* (Dec. 1885), 147-49.
[16] Kim, "Popularity of Partnership."
[17] Bodenhorn, "Partnership"; Kim, "The Popularity of Partnership"; Lamoreaux, "The Partnership Form of Organization."

Attleboro area was almost 80 percent, twice as high as that in New York. The tremendous gap between the two regions clearly demonstrates the uniqueness of the Providence-Attleboro area. The entrepreneurs of this region were much more likely to organize partnerships.

I crosschecked this result using the set of detailed credit reports produced by R. G. Dun & Co., a precursor of the modern firm Dun & Bradstreet. Starting in 1842, R. G. Dun & Co. agents gathered information on the firms in their various regions and forwarded it to their headquarters in New York, where it was inscribed in ledgers. Each record was updated on average every six months. The records include the owners of the firm and their status (age, family relation, personal aptitude as an entrepreneur, and wealth); firm performance (sales, profit); financial transactions (mortgages, failure, bankruptcy, etc); and an evaluation of their creditworthiness.[18] The records covering 1842 to 1890 consist of approximately 2,600 ledgers with 300-400 pages per volume, covering about 1.2 million firms.[19]

Figure 1 shows a sample record for one entrepreneur, Charles E. Hayward, which begins in 1851 when he joined Thompson, Hayward & Co.[20] Originally, Archibald Thompson was a tinner running his own firm alone. However, he brought in jewelers to expand his venture. This partnership lasted about four years, and then the firm dissolved.[21] In 1856, Charles Hayward organized a partnership with Jonathan Briggs, with the name "Hayward & Briggs." In the early 1880s, Hayward and Briggs dissolved. Charles Hayward adopted his son Walter E. Hayward as copartner, and the firm became "C. E. Hayward & Co." In 1887, that firm was dissolved when Charles Hayward died. Walter Hayward continued the business by then adopting George L. Sweet, and the firm name became "Hayward and Sweet."[22]

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[18] One caveat is that information on characteristics of owners, firm performance, or credibility is not so systematically recorded for the following analysis. The most reliable is the information on the change of ownership structure, which was checked on average every six months.

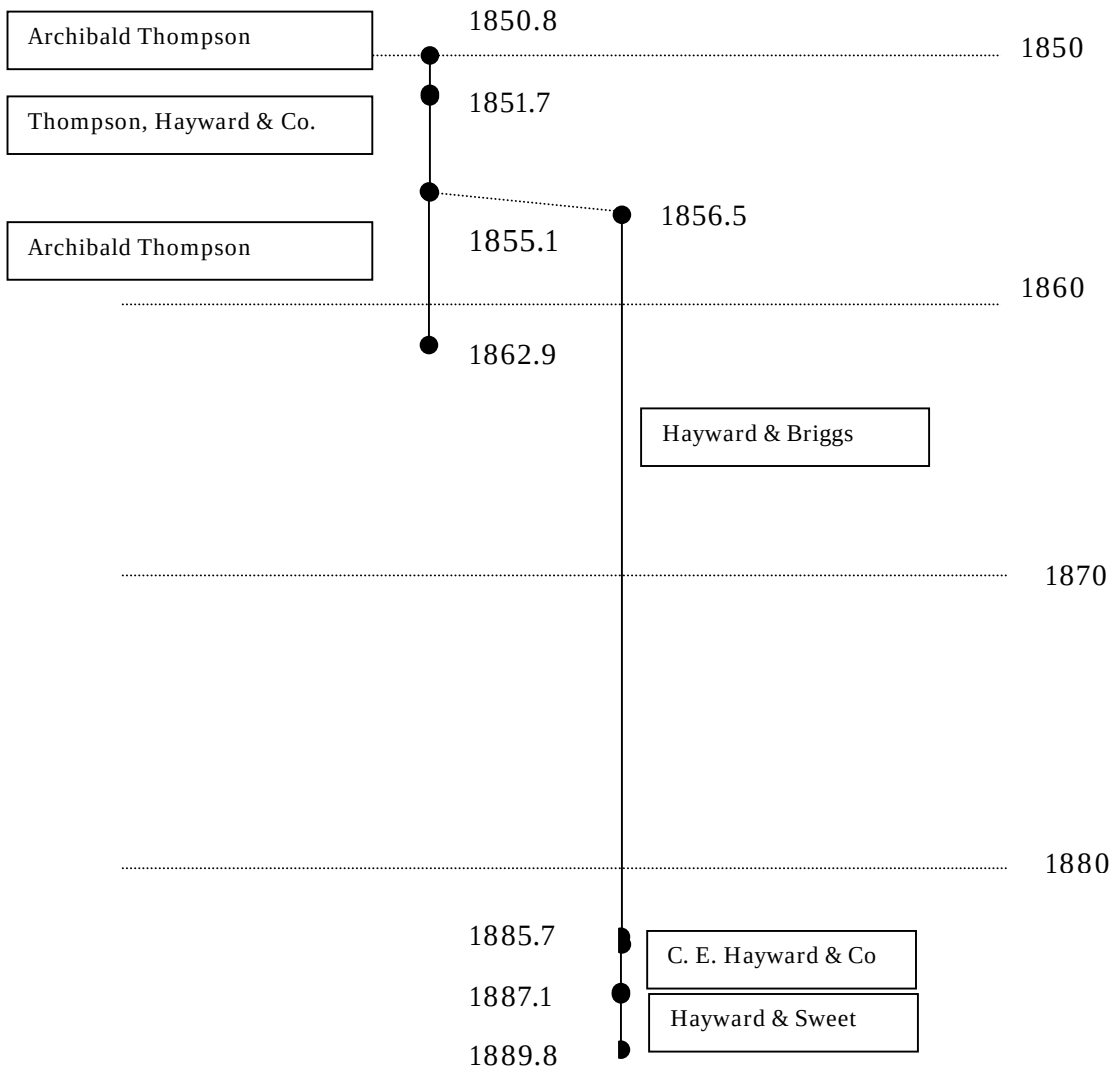
[19] For a general description of the R. G. Dun & Co. Collection, see James H. Madison, "The Credit Reports of R. G. Dun & Co. as Historical Source," *Historical Methods Newsletter* 8 (Sept. 1975): 128-31. Rowena Olegario, "Credit Reporting Agencies: A Historical Perspective" in *Credit Reporting Systems and the International Economy*, ed. Margaret J. Miller (Cambridge, Mass., 2003), 115-60.

[20] "Co." is Samuel N. Carpenter.

[21] Archibald Thompson ran the firm alone until 1862, when he became insolvent.

[22] Massachusetts vol. 9, pp. 294, 293, 310, 355, 647, 708, R. G. Dun & Co. Collection, Baker Library, Harvard Business School. *The Manufacturing Jeweler* has an obituary on Walter E. Hayward, who died in 1909. See *The Manufacturing Jeweler* (5 Aug. 1909), 258. This article confirms the chronology from the R. G. Dun & Co. Collection.

FIGURE 1
Structure of Data in the R. G. Dun & Co. Collection: Charles E. Hayward



Firm Characteristics from *The Manuscript Census of Manufacturers*

	Census Year	Worker		Capital	Total product
		Male	Female		
Archibald Thompson	1850	3		4,000	4,950
Hayward & Briggs	1860	30		60,000	75,000
Hayward & Briggs	1870	53	4	75,000	90,000
Hayward & Briggs	1880	47	1	106,000	102,000

Sources: *The Manuscript Census of Manufactures*, and Massachusetts, vol. 9, pp. 294, 293, 310, 355, 647, 708, the R. G. Dun & Co Collection, Baker Library, Harvard Business School.

The above description shows that the R. G. Dun & Co. Collection allows me to count ownership structure not just by name, but also by the actual number of owners. As presented in Table 3, the share of partnerships was almost 60 percent from 1860 to 1880. This is about 20 percent lower than the results from the directory. However, the number of firms recorded in both data sources implies that small firms were more truncated in the directory than in the R. G. Dun & Co. Collection.[23] Because small firms were more likely to be proprietorships, the two measures are consistent.[24]

We see from Table 3 that more than 90 percent of these partnership firms were organized by two or three copartners.[25] Note the fact that most copartners were not related. Family members comprised only 16 percent of the total of partnership firms for 1860 or 1870 and 25 percent for 1880.[26] This belies a general notion that connects partnerships with family businesses. At the same time, the low share of family partnerships implies that entrepreneurs organized partnerships for mobilizing resources from non-family members rather than preserving present assets of the firm, corroborating the resource mobilization hypothesis.

Partnerships and Firm Size

Did the uniqueness in the ownership structure of the Providence-Attleboro jewelers stem from a need from a need to resolve informational problems and to accommodate resource mobilization, as I hypothesized? The directory can answer this question to some extent. The directory denotes whether Providence-Attleboro jewelers had sales offices in New York. Table 2 shows the share of firms with New York offices according to ownership structure. Some small partnership firms might have provided parts to larger firms as subcontractors, or they might have performed sales activities without opening New York offices; a large number of partnership firms therefore did not run New York offices. However, the comparison with proprietorship firms indicates that the partnership firms were more likely to have New York offices than the proprietorship firms. Rather than

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[23] In Table 3, the increasing trend in the number of firms recorded in the R. G. Dun & Collection shows that the total number recorded in 1885 is larger than that in the directory.

[24] For the size of proprietorship and partnerships, see Table 4.

[25] Shuhe Li and Weiying Zhang examine and substantiate Alchian and Demsetz's arguments in a case where only two parties are involved. Shuhe Li and Weiying Zhang, "Optimal Assignment of Principalship in Teams," *Journal of Economic Behavior and Organization* 44 (Jan. 2001): 105-27.

[26] If the R. G. Dun & Co. Collection denotes that members of a partnership were family relations such as parents and children, siblings, uncle and nephew, or father-in-law and son-in-law, etc., the partnership is regarded as consisting of family members. Some partnership firms have names like "(John) Smith and (Mark) Smith," but the R. G. Dun & Co. Collection does not state their relationship. I also counted these firms as partnerships of family members.

producing parts for other manufacturers in their locale, partnerships tended to sell final products through active promotion in large cities.

TABLE 3
Ownership Structure of Jewelry Producers: The Providence-Attleboro Area, 1860-1880
(%)

	1860	1870	1880
Panel A. Share of Ownership Structure			
Corporation	1.4	2.3	1.5
Partnership	59.4	54.1	56.7
Proprietorship	38.4	42.4	41.1
Others	0.7	1.2	0.7
Total	100.0	100.0	100.0
Total Number of Firms	138	172	270
Panel B. Number of Copartners for Partnership Firms			
2	62.2	72.0	64.7
3	34.1	21.5	28.1
4 or more	2.4	1.1	2.0
Unknown	1.2	5.4	5.2
Total	100.0	100.0	100.0
Total Number of Firms	82	93	153
Panel C. Family and Non-Family Partnership			
Family only	15.9	16.1	24.8
Family + non-family	7.3	10.8	13.1
Non-family	74.4	68.8	57.5
Unidentified	2.4	4.3	4.6
Total	100.0	100.0	100.0
Total Number of Firms	82	93	153

Source: the R. G. Dun & Co. Collection, Baker Library, Harvard Business School.

I also examined my hypothesis by measuring firm size according to ownership structure. If partnerships were organized for exploiting economies of scale, they should be larger than proprietorship firms. Similarly, if partnerships successfully ameliorated informational asymmetry problems, they could have performed intensive sales activities and managed larger firm size than proprietorships. Therefore, partnerships were expected to be larger than proprietorships.

I estimated firm size using *The Manuscript Census of Manufactures*, a record of firm-level information such as total product, capital, employ-

ment, and wages, collected for the census of manufactures.[27] Because census agents were supposed to record every manufacturing firm producing more than $500 during the survey period, its coverage is quite comprehensive.[28]

Table 4 shows the results. First, partnerships constituted about 60 percent of the firm population from 1850 to 1880, which again confirms the estimates from the two sources. Second, the average size of partnership firms by employment, capital, and total output was at least twice as large as that of the proprietorship firms. The adoption of a partnership was strongly connected with larger firm size.

However, the variance of proprietorships and partnerships measured by the first and third quartile overlap requires us to examine the distributional pattern further. Figure 2 depicts the share of each ownership structure according to firm size. Both proprietorships and partnerships occupy non-trivial shares of each quintile, which is the source of the large variance. However, their relative share in each quintile is uneven. Whereas proprietorships occupy more than 50 percent of the first and second quintile, partnerships are more than 50 percent in the third to fifth quintile, with an increasing trend. Although both proprietorships and partnerships coexisted in every firm size level, larger firms were dominated by partnerships.

Comparison with other industries further underscores this pattern. In most industries, partnerships were organized mainly for medium-size production during the nineteenth century. However, this does not mean that partnerships were dominant at the medium-size level. Even for the third or fourth quintile, the share of partnerships did not exceed 50 percent, and the majority were always proprietorships.[29] This difference manifests the strong connection of partnerships with larger firm size in the Providence-Attleboro area.

Partnerships and Firm Growth

Whereas the analysis so far has focused on the cross-sectional pattern, I also examined choice of ownership structures and firm growth through time. First, I matched the R. G. Dun & Co. Collection with *The Manuscript Census of Manufactures*, and measured how much a firm grew for a ten-

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[27] *Nonpopulation Census Schedule for Massachusetts, 1850-1880,* Microfilm ID T1204, pp. 5, 6, 15, 21, 30, 31, and 32; Rhode Island State Archives, *Non-population Census Schedule for Rhode Island*.

[28] For a general introduction to the manuscript census of manufactures, see Jeremy Atack and Fred Bateman, "U.S. Historical Statistics: Nineteenth-Century U.S. Industrial Development through the Eyes of the Census of Manufactures: A New Resources for Historical Research," *Historical Methods* 32 (Fall 1999): 177-88.

[29] Kim, "Popularity of Partnership."

year period and how this growth coincided with changes in ownership structure.[30]

TABLE 4
Firm Size According to Ownership Structure, 1850-1880

	1850		1860		1870		1880	
Panel A. Share of Ownership Structures								
Corporation	0.0		1.7		2.7		2.9	
Partnership	55.6		66.4		54.8		56.8	
Proprietorship	44.4		31.9		41.1		39.6	
Total	100.0		100.0		100.0		100.0	
Number of firms	63		116		146		273	
Panel B. Number of Workers (Median)								
Corporation	n.a.		n.a.		n.a.		n.a.	
Partnership	15	(10, 25)	22	(10, 35)	20	(9, 34)	23	(14, 45)
Proprietorship	10	(6, 18)	10	(4, 17)	6	(2, 18)	7	(4, 18)
Total	12	(6, 20)	15	(8, 30)	15	(4, 30)	17	(6, 34)
Panel C. Capital (Median, $1,000)								
Corporation	n.a		n.a.		n.a.		n.a.	
Partnership	4.5	(2.0, 23.0)	8.0	(3.0, 25.0)	13.0	(3.3, 30.0)	15.0	(5.0, 33.5)
Proprietorship	2.5	(1.2, 6.5)	3.3	(1.5, 5.5)	2.0	(0.3, 10.0)	4.0	(1.0, 10.0)
Total	3.3	(1.5, 12.0)	5.0	(2.0, 20.0)	8.0	(1.8, 20.0)	10.0	(2.5, 25.0)
Panel D. Total Product (Median, $1,000)								
Corporation	n.a		n.a.		n.a.		n.a.	
Partnership	20.0	(11.0, 45.0)	30.0	(11.5, 50.0)	40.0	(14.5, 57.5)	40.0	(13.6, 70.0)
Proprietorship	8.5	(4.9, 22.5)	10.0	(5.0, 20.0)	13.5	(3.9, 25.0)	10.5	(3.1, 30.2)
Total	15	(8.0, 40.0)	20.5	(9.8, 43.3)	25	(8.0, 50.0)	25.4	(7.4, 60.0)

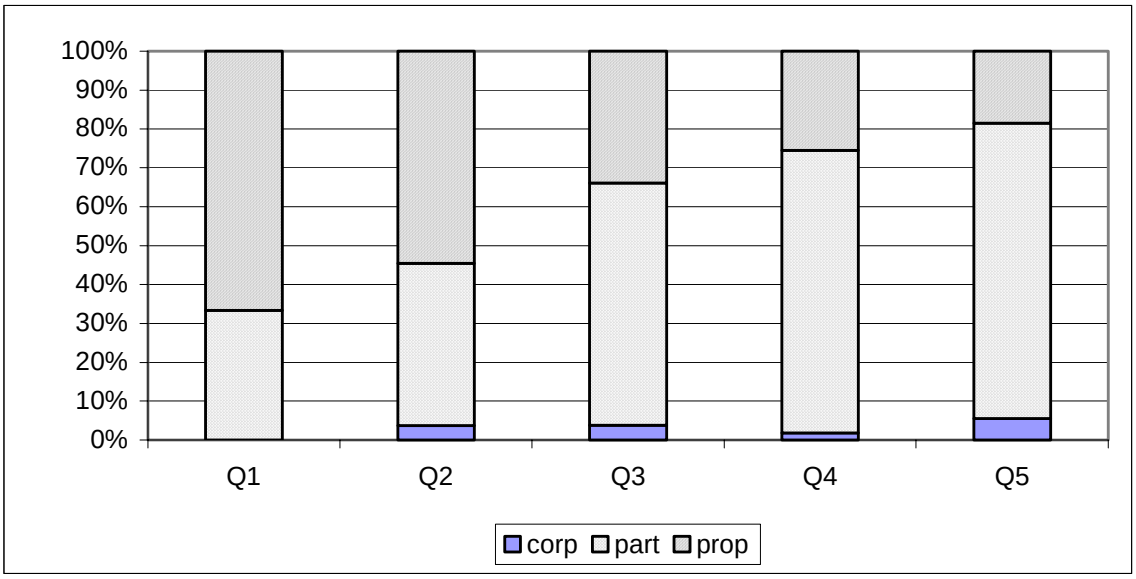
Source: *The Manuscript Census of Manufactures.*

Because the analysis is concerned with the choice between a proprietorship and a partnership, four basic patterns in ownership structure are involved: proprietorships that remain unchanged for ten years; proprietor-

[30] For example, the matching shows that the output of Hayward & Briggs in Figure 1 increased by $15,000 from 1860 to 1870 and by $12,000 from 1870 to 1880.

ships that shift to a partnership; partnerships that transform into a proprietorship; and partnerships that continue as partnerships. We regard the growth rate of proprietorship firms that remained proprietorships for ten years as the baseline case. The advantage of a partnership for mobilizing resources suggests three patterns. First, if a proprietorship firm was transformed into a partnership by adopting a copartner, the co-

FIGURE 2
Share of Ownership Structure per Quintile of Total Product, 1880



Notes: Quintile values are Q1=5030, Q2=14600, Q3=36200, and Q4=65853. Total number of observation is 272, and each quintile consists of roughly 55 firms. The relative share of each ownership structure per quintile is roughly the same for other census years.
Source: *The Manuscript Census of Manufactures*, 1880.

partner should have introduced new capital for firm growth. This should have been accompanied by large, discrete increases in firm size. Therefore, we expect that the growth rate of firms that shifted from a proprietorship to a partnership would be higher than that of those that remained as proprietorships. Second, dissolution of a partnership into a proprietorship means the withdrawal of a certain amount of capital accompanied by a decrease in firm size. Therefore, the growth rate of those firms should have been lower than that of firms that continued to be maintained as proprietorships. Third, due to economies of scale, the firms

sustaining a partnership should have grown faster than those sustaining a proprietorship.[31]

TABLE 5
Growth of the Firm According to OwnershipSstructure

Dependent Variables	**ln(Capital$_{T+1)}$**	**ln(Worker$_{T+1)}$**
ln(Capital T)	0.58	
	(0.06)***	
Ln(Worker T)		0.82
		(0.06)***
Ownership Changes Dummies [a]		
Proprietorship → Partnership	0.15	-0.2
	(0.32)	(0.22)
Partnership → Proprietorship	0.01	-0.2
	(0.32)	(0.22)
Partnership → Partnership	0.67	0.29
	(0.22)***	(0.15)*
Dummy for 1860	-0.29	-0.12
	(0.24)	(0.17)
Dummy for 1870	0.22	-0.06
	(0.21)	(0.15)
Constant	4.12	0.67
	(0.59)***	(0.23)***
Observations	123	122
R-squared	0.57	0.68

[a] Base is "Proprietorship → Proprietorship."
Standard errors in parentheses
*** Significant at p < .01 level
** significant at p< .05 level
* significant at p < .10 level
Sources: *The Manuscript Census of Manufactures*, and the R. G. Dun & Co. Collection, Baker Library, Harvard Business School.

[31] In Kim, "Popularity of Partnership," I run a similar regression for the entire group of manufacturing firms in Bristol and Essex County, Massachusetts, and I discuss various issues related to estimation in detail.

Table 5 shows estimates of firms' growth rates according to changes in ownership structure. Because of a lack of observations, the regression result does not support the effect of adding or losing copartners.[32] However, the growth rate of firms that remained as partnerships was much higher than those that remained as proprietorships over the entire ten-year period. This evidence supports an advantage of partnerships over proprietorship for firm growth.

The advantage of partnerships for firm growth can be further explored by analyzing the ownership structure of jewelry firms at their initial stage. If entrepreneurs recognized the merits of partnerships, they should have tried to adopt it at the outset of their venture. Unfortunately, the R. G. Dun & Co. Collection traces firm histories from their very beginnings in only 40 percent of cases.[33] Using the available information, I report initial ownership structure of firms in Table 6. Among the firms that were started between 1861 and 1880, about 60 percent began as partnerships. Although the R. G. Dun & Co. Collection is somewhat biased toward stronger firms, it still shows the popularity of partnerships.

TABLE 6
Ownership Structure at the Beginning of the Firm
(%)

	1861-1865	**1866-1870**	**1871-1875**	**1876-1880**	**Total: 1861-1880**
Proprietorship	56	47	33	42	44
Partnership	44	53	67	58	56
Number of Firms	25	83	85	113	306

Source: the R. G. Dun & Co. Collection, Baker Library, Harvard Business School

We can better examine this initial choice of ownership structure by analyzing behavioral patterns of individual entrepreneurs. I examined biographical information of entrepreneurs in *The Manufacturing Jeweler*. Some obituaries or special articles describe the entire lives of the jewelers in detail. The following is an example:

> Everybody in the trade knew the late Nathaniel Grant, who died on Sunday, Sept. 8 (of 1889). ------ Nathaniel Grant was born on September 23, 1833 in Berwick, Maine. He was the son of

[32] The observations for the "proprietorship → partnership" and "partnership → proprietorship" are 11 each. In Kim, ibid.,, the regression shows the expected result.

[33] See Duol Kim, "Firm Financing, Ownership Structure and Market Competition in the United States Manufacturing during the Nineteenth Century" (Ph.D. diss., University of California, Los Angeles, 2003), chap. 2, for the truncation problem of the R. G. Dun & Co. Collection.

> Nathaniel and Hannah (McIntire) Grant. At the age of seventeen he started out in the world for himself, going to North Attleboro, Mass., to learn the jeweler's trade. Here he had the good fortune to get into that shop which has been able to give a thorough instruction to so many of our older manufacturers, that of Tifft & Whiting. After 5 years apprenticeship in that shop he came to Providence in January, 1856, and went into the coloring business with Thomas Quayle, now the manufacturer of gold goods at 60 Richmond street. The firm name was Quayle & Grant. ------ The partnership with Mr. Quayle was dissolved a year later, and another formed with the late Charles Downs under the style of Nathaniel Grant & Co. The business was changed into that of manufacturing gold and plated jewelry, principally ladies' goods. This partnership continued until 1863, when Mr. Grant became sole owner of the business, the same firm name being retained. Mr. Grant continued manufacturing until 1887, when after 30 years of business experience, owing to failing health and adverse circumstances, the business was closed up, although the sign upon the door, at 121 Broad street, remains as it has for so many years.
>
> Mr. Grant's business was very successful for many years. He had a large shop, employed fifty hands, had an office at 20 Maiden Lane, New York, and manufactured a class of gold white stone goods that filled a popular want ---"[34]

I found 250 biographies in the issues from 1884 to 1910. Of these, I selected the 148 biographies of people whose firms appeared at least once in *The Manuscript Census of Manufactures* from 1850 to 1880. Comparisons reveal that the information from these biographies is highly consistent with the R. G. Dun & Co. Collection. Table 7 shows the distribution of biographical information according to the year of birth and the year of first business as owner. The biographical information mainly covers entrepreneurs who were born between 1810 and 1850 and who started their business between 1840 and 1880. This time span is concurrent with those of *The Manuscript Census of Manufactures* and the R. G. Dun & Co. Collection.

As shown in Table 8, more than 50 percent of the jewelry entrepreneurs started their first businesses in their 20s, and 80 percent of them before age 40. The data from *The Manufacturing Jeweler* show that 90 percent of these entrepreneurs organized partnerships from the very beginning. Considering that younger entrepreneurs were more likely to be under resource constraints, the choice of partnership would have been a way to overcome the resource mobilization problem.

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[34] *The Manufacturing Jeweler* (1 Oct. 1889), 50.

TABLE 7
Distribution of Biographical Information

Year	Birth	Starting Year
1801-1810	5	
1811-1820	18	
1821-1830	39	
1831-1840	46	9
1841-1850	22	16
1851-1860	4	34
1861-1870		29
1871-1880		38
1881-1890		2
Unidentified	14	20
Total	148	148

Source: *The Manufacturing Jeweler*, various issues.

TABLE 8
Age of Entrepreneurs When Starting Their Own Firm

Age	Number of Entrepreneurs
< 21	5
21-25	28
26-30	32
31 –17	17
36-40	17
40 <	18
Unidentified	31

Source: *The Manufacturing Jeweler*, various issues.

Because the biographies are biased toward entrepreneurs of more successful firms, one cannot argue conclusively from these results that the majority of jewelry entrepreneurs started their first venture by organizing a partnership. However, the information does suggest that at least successful entrepreneurs preferred partnerships. Furthermore, if the advantage of partnerships were widely recognized, every entrepreneur would have wanted to organize a partnership. Not all of them succeeded, but those who were more capable should have been more able to find good partners and therefore be more likely to succeed in organizing a partnership. The fact that 138 of the 166 firms described in *The Manufacturing Jeweler* were partnerships and only 17 were proprietor-

ships (11 of the firms were unidentified) illustrates how important organizing a partnership was considered for firm survival and growth.[35]

Our discussion so far shows that partnership firms grew faster and were larger than proprietorship firms. Thus, entrepreneurs tried to organize partnerships when they started new firms. However, it is puzzling that almost 40 percent of firms were still proprietorships, as shown in Tables 3 and 4. If the advantages of partnership were so apparent, why was it that not all entrepreneurs organized partnerships?

There are several possibilities. First, if resource mobilization was the major reason to organize a partnership, entrepreneurs with sufficient resources may not have needed partnerships. Second, if a firm provided parts for other firms in the region, the firm may not have needed to engage in promotional activities or be in a partnership. Third, not all entrepreneurs were able to find good partners, and as a consequence, some managed their businesses alone. Lastly, partnerships frequently broke up, and in many cases, one of the copartners of a dissolved partnership continued the firm as a proprietorship.[36]

Analysis of the jewelry firm population can better illuminate the role of these factors. Table 9 shows the duration of ownership structures for firms in 1860 and 1870. There are three ways a proprietor can change the ownership structure: shut down, sell the firm, or bring on a partner. In the case of a partnership, there are four ways to change the structure: shut down, sell, shift to a proprietorship, or change the copartner(s). If we focus on 1870, Panel A shows that within five years 40 percent of proprietorship firms and 47 percent of partnership firms experienced changes in ownership structure. Panel B enumerates the number of firms by ownership structure and the causes of discontinuity. In the case of proprietorship firms, half of the firms closed or sold out and half shifted to partnerships. However, partnerships show quite a different pattern; only 20 percent of those firms were sold or closed. The remaining 80 percent changed their ownership structure while continuing production. An interesting fact is that the number of partnership firms dissolving into proprietorships was almost the same as proprietorship firms shifting into partnerships. This dynamic pattern explains why some firms are always observed as proprietorships in the cross-sectional data.[37]

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[35] Of the 138 partnerships, 18 were formed when an employee was promoted to copartner.

[36] Kim, “Popularity of Partnership.”

[37] A similar pattern is found for other industries; ibid.

TABLE 9
Duration of Partnership Contracts Compared with Duration of Proprietorships

Panel A. Change of Ownership Structures: Cumulative Rates (%)

# of Years from Base Years (1860 & 1870)	Firms Recorded in 1860		Firms Recorded in 1870	
	Proprietorship	Partnership	Proprietorship	Partnership
0	0	0	0	0
1	11	25	6	18
2	25	39	19	28
3	30	48	27	34
4	36	55	36	40
5	42	60	40	47
6	45	65	45	55
7	45	69	52	63
8	48	72	56	69
9	59	72	58	71
10	59	75	62	73
Number of firms at base years	53	83	73	93

Panel B. Number of Firms Experiencing Change of Ownership Structures for Five Years from the Base Years and Causes of the Changes

Change of Ownership Structures	Firms Recorded in 1860		Firms Recorded in 1870	
	Proprietorship	Partnership	Proprietorship	Partnership
Proprietorship, Total	22		29	
Organize Partnership	3		14	
Close-up or Sales	18		14	
Other	1		1	
Partnership Contract Discontinued, Total		50		44
Shift to Proprietorship		10		12
Change of Copartners		12		20
Close-up or Sales		20		8
Other		8		4

Notes: For Panel A the first column indicates that there were 53 firms recorded in the R. G. Dun & Co. Collection, of this 1860 cohort; 11 percent changed ownership structure during 1861, and so on. Panel B lists the number of firms experiencing change of ownership structure for 5 years, by causes of the change. Thus, according to Panel A, 42 percent, that is, 22, proprietorship firms of the 1860 cohorts experienced change of ownership structure until 1865; 3 shifted to partnership and 18 were closed up or were sold out.
Source: the R. G. Dun & Co. Collection, Baker Library, Harvard Business School.

Concluding Remarks

In economics and managerial science, the corporation has dominated studies of the ownership structure of the firm. "Corporate finance" or "corporate governance" is regarded as almost identical to "firm finance" or "firm governance." Recently, scholars have paid more attention to the diversity of firm ownership structures.[38] This has been motivated to some extent by the wide adoption of joint ownerships like partnerships in developing countries or in newly emerging industries. Although some economists investigate under what conditions partnerships are theoretically optimal, empirical analysis of the relevance of such theoretical considerations is rare.[39] This case study of the jewelry industry can contribute to narrowing the gap between theoretical and empirical analyses.

Partnerships were especially popular among the Providence-Attleboro jewelry producers during the nineteenth century. This structure stemmed from the industrial conditions of the Providence-Attleboro area. Because of the nature of the jewelry product, firms needed to carry out active promotion to jewelry wholesalers in New York. The geographical separation of production and sales made partnerships more attractive for ameliorating information problems. In addition, entrepreneurs needed large-scale production to economize on sales, and some of them organized partnerships to mobilize resources. The data support these conjectures. The share of partnerships in the Providence-Attleboro area was about 60 percent, much higher than in any other industry as well as among jewelry firms in other regions. The partnership firms were larger and grew faster than proprietorships, which supports the idea that partnerships were efficient in resolving information problems and in mobilizing resources to capture economies of scale.

The popularity of partnerships declined beginning in the late nineteenth century. In 1901, *The Manufacturing Jeweler* reported, "it has become quite the fashion in these modern times for ordinary small business concerns to abandon the firm plan of doing business and to become incorporated."[40] In the next year, it printed an article entitled "Advantage of Incorporation."[41] According to *The Census Of Manufactures*, the share of corporations in the jewelry industry increased from 9 to 20 percent between 1899 and 1909.[42] Considering that large firms were concentrated in the Providence-Attleboro area, the ratio of incorporation

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[38] Representative is Henry B. Hansmann, *The Ownership of Enterprise* (Cambridge, Mass., 1996).
[39] Hongbin Cai, "A Theory of Joint Asset Ownership," *Rand Journal of Economics* 34 (Spring 2003): 63-77.
[40] *The Manufacturing Jeweler* (4 April 1901), 330.
[41] Ibid. (30 Oct. 1902), 496.
[42] *The Census of Manufactures 1910*, 138.

in the Providence-Attleboro area should also have been much higher. Why did firms suddenly shift to the form of a corporation? Were there changes in industrial conditions or legal regimes? Further investigation of this problem can deepen our understanding of the evolution of firm ownership structures.