# Special Charters, General Incorporation, and the Democratization of American Innovation

Moshe Hazan[*] Nir Lavee[†] David Weiss[‡]

[*] Monash University; hazan.moshe@gmail.com
[†] Tel Aviv University; nirlavee1@mail.tau.ac.il
[‡] Tel Aviv University; davidweiss@tauex.tau.ac.il

January 2026

**Abstract**

For most of the nineteenth century, access to the corporate form in the United States depended on "special charters" granted by state legislatures. In practice, this system largely restricted incorporation to politically connected elites, limiting broad participation in business formation and economic activity. We study the consequences of the transition from special charters to general incorporation using variation in the timing of states' adoption of general incorporation laws in a state-year panel spanning 1830–1920. We find that the adoption of general incorporation laws led to a substantial increase in patenting, with the increase driven almost entirely by individuals in the middle of the socioeconomic distribution, consistent with the hypothesis that the special charter system constrained their access to incorporation. The reform also increased the diversity of inventors and the number of "breakthrough" patents.

**Keywords:** innovation, incorporation, patents, institutions
**JEL codes:** N41, O31, K22

# 1. Introduction

A large and growing literature documents that institutions shape the level and direction of innovation (Acemoglu et al. (2001), **?**, **?**). Property rights, contract enforcement, and the legal organization of firms determine who can credibly commercialize new ideas, and therefore who has an incentive to develop them in the first place. Yet while there is broad agreement that formal institutions matter, credibly identifying the causal effect of specific institutional changes on innovation outcomes remains difficult. Most institutional transitions are gradual, endogenous to economic conditions, and confounded with other concurrent reforms, making it hard to isolate the contribution of any single change. This paper exploits a well-documented, staggered institutional transition in nineteenth-century America to provide what we believe is the first causal estimate of the effect of open access to incorporation on innovation.

The critical barrier we study is the special charter system. In the early United States, forming a limited liability corporation required an individual act of the state legislature. These so-called special charters were the exclusive legal mechanism for incorporation for much of the nineteenth century, and obtaining one depended heavily on personal connections to legislators, political bargaining, and, often, outright payment (Hilt (2017a), Lamoreaux and Wallis (2020), Wright (2009)). An entrepreneur who lacked political access—however productive her ideas—had no reliable path to corporate status. The implication for innovation is direct: a patent is far less valuable if the inventor cannot form a firm to exploit it. We argue that, by restricting access to the corporate form to a narrow and politically connected elite, the special charter regime created a systematic barrier to innovative activity among a large share of the population.

The reform we study is the prohibition of special charter issuance, adopted by most U.S. states between 1846 and the 1880s. These prohibitions required that henceforth all corporate formation proceed under general incorporation laws—statutes open to any qualifying applicant without individualized legislative approval. This institutional shift replaced a discretionary, politically mediated system with one governed by uniform legal rules, fundamentally altering the costs and accessibility of the corporate form. Critically for identification, states adopted these prohibitions at different times and for reasons that, as we document, were often exogenous to local innovative activity. This staggered adoption across states and decades generates the variation we exploit in a difference-in-differences framework.

Using state-by-year patent counts from USPTO annual reports for the period 1830–1920, we estimate the causal effect of the prohibition on patenting using the two-stage event-study estimator of Gardner et al. (2024), which is robust to heterogeneous treatment effects under staggered adoption. We find that prohibiting the issuance of special charters led to an increase of 10.8 patents per 100,000 population—a 68% increase relative to the full period mean. The event-study estimates show no evidence of differential pre-trends in the ten years preceding the reform, supporting a causal interpretation. The effect persists and grows in the years following adoption, consistent with a gradual expansion of the entrepreneurial pool rather than a one-time compositional shift.

Consistent with the hypothesis that the special charter system favored a small group of elites, using first-name–SES mappings from Olivetti and Paserman (2015) we find that the increase in patenting following the reform was driven primarily by individuals in the middle of the socioeconomic distribution. This pattern provides strong evidence that the special charter regime disproportionately constrained the middle class, limiting their ability to participate in innovation prior to the reform. Using charter incorporator data from Wright (2015), we construct state-level measures of political connectedness based on surname overlap with historical charter recipients. We find that patenting activity among connected surnames—those whose family names appeared among pre-reform charter grantees—declines gradually following the reform. In contrast, the estimated effects for non-connected surnames are weakly positive, likely reflecting limitations of the available sample, as discussed in detail in the relevant section. Taken together, these results are consistent with the interpretation that the reform reduced the relative advantage previously enjoyed by politically connected individuals.

The reform also raised the quality of innovation, not merely its quantity. Using forward citation data and breakthrough patent classifications from Kelly et al. (2020), we find that the transition away from special charters increased citations per 100,000 population by 5.0 and total breakthrough patents by 6.9, for the entire sample period. We additionally document an increase in the surname diversity of patent inventors, consistent with broader participation in innovative activity following the reform. These findings are robust to a comprehensive set of specification checks, including controls for political affiliation, regionyear fixed effects, and alternative sample windows.

A primary identification concern is that states may have abolished special charters precisely when and because their economies were developing rapidly, confounding the reform effect with a broader growth trend. We address this in several ways. First, the event-study estimates consistently show flat pre-trends, suggesting that treated and control states were on parallel trajectories before the reform. Second, and more directly, we exploit the fiscal crisis of the early 1840s as a source of exogenous variation in reform timing. Following a wave of sovereign debt defaults in 1841, nine U.S. states defaulted on their government debt. Five of these states responded by revising their constitutions, all addressing the issue of special charters, while only one—Indiana—outright banned their issuance. We exploit Indiana's progressive step against special charters relative to the defaulting states that did not revise their constitutions to run a reduced-form specification. Because the timing of constitutional revision in this period was driven by a common macroeconomic shock rather than state-specific innovation trajectories, this setting provides a cleaner test of the reform's causal effect. Results from this reduced-form case study closely mirror the baseline estimates.

This paper makes several contributions. First, it provides the first causal estimates of the effect of open access to incorporation on innovation. The existing historical literature documents the distributional and political dimensions of the special charter system with great richness (Hilt (2017a), Lamoreaux and Wallis (2020), Hamill (1999), Wright (2009)), but does not estimate causal effects using modern econometric methods. Second, it contributes to the broader literature on institutions and economic development by identifying a specific legal mechanism—access to the corporate form—through which po-

litical privilege can suppress innovation and entrepreneurship. Third, it adds to a growing body of work studying how inclusive institutions affect the distribution of economic opportunity, documenting that the gains from institutional liberalization were concentrated among those previously excluded rather than those already well-positioned (**?**, **?**). Fourth, it contributes to the literature on historical determinants of innovation, complementing studies of intellectual property rights, market size, and human capital by highlighting the role of organizational access (Machlup and Penrose (1950), **?**).

The remainder of the paper is organized as follows. Section 2 describes the special charter system, documents its economic significance and political structure, and traces the process of prohibition that generates our identifying variation. Section 3 describes the data. Section 4 presents the research design and identification strategy. Section 5 reports the main results on patent quantity, quality, political connectedness, and surname diversity. Section 6 presents the case study exploiting the 1841 fiscal crisis. Section 7 concludes.

## 1.1 Related Work

This paper draws on and contributes to several strands of literature. A large body of historical and economic scholarship documents the special charter period in the United States, including George Heberton Evans (1948), Hurst (1970), Seller (1991), Hamill (1999), Ireland (2004), Wright (2009), Wright (2013), Hilt (2017a), Lamoreaux and Novak (2017), and Lamoreaux and Wallis (2020). These studies establish the institutional mechanics of the charter system, characterize the political economy of charter allocation, and trace the transition toward general incorporation. We build directly on this literature for our historical and institutional background, while extending it by providing the first causal estimates of the innovation consequences of the reform.

More broadly, the paper contributes to the literature on institutions and economic growth. A canonical finding in this literature is that secure property rights and open access to economic organization promote investment and innovation (**?**, **?**). Our setting provides a rare opportunity to estimate this effect using plausibly exogenous variation in institutional access, rather than cross-country comparisons that are subject to omitted variable concerns. It also relates to the political economy literature on how elites use institutional control to entrench themselves (**?**, **?**): the special charter system is a textbook example of a limited access order in which political connections determined economic opportunity.

The paper also connects to the literature on the historical determinants of innovation in the United States. **?** document that early American patent institutions were unusually open and market-oriented, fostering broad-based inventive activity. Our findings are consistent with their emphasis on access: when legal barriers to commercialization were removed, the distribution of inventive activity broadened and its level rose. We complement their focus on patent institutions by highlighting incorporation access as an additional, previously understudied, determinant of innovative activity. Finally, our paper relates to work on how inequality in access to economic opportunity shapes aggregate outcomes, connecting the historical evidence to contemporary policy debates about barriers to entrepreneurship and firm formation.

# 2. Special Charters

## 2.1 Background

In the early United States, incorporation was only available through a special charter granted by the state legislature. That is, through a political process, where each corporation required explicit approval by state lawmakers. This system, inherited from British legal practice, emerged in a context where the number of corporations was small and their activities were largely quasi-public in nature—such as transportation infrastructure, banking, religious institutions, and municipalities. Under these conditions, case-by-case legislative approval was administratively feasible and broadly aligned with the perceived public interest.

As the economy expanded during the nineteenth century, however, the demand for corporate organization grew rapidly beyond these traditional sectors. In the absence of an alternative legal framework, the special charter system was extended to purely private economic activities, including manufacturing and other commercial enterprises. Each corporation still required a separate legislative act, specifying the identity of incorporators, the scope of activity, and the terms under which the firm could operate. In effect, the corporate form remained rationed through a political process, even as it became increasingly central to private economic activity.

This institutional arrangement had important implications for economic access. Because incorporation required legislative approval, entry into the corporate sector depended not only on entrepreneurial ability or the quality of an idea, but also on access to political networks and influence. Historical evidence suggests that charters were disproportionately granted to a relatively small, well-connected segment of society, often through processes involving political bargaining, personal relationships, and, at times, financial inducements (Hilt (2017a), Lamoreaux and Wallis (2020), Wright (2009)). As a result, large portions of the population faced substantial barriers to forming corporations.

In the context of this paper, the key implication is that the special charter system created unequal access to a critical input for innovation: the ability to organize economic activity through the corporate form. Entrepreneurs without political connections faced higher costs—or outright barriers—to commercializing their ideas, while those with access to the legislative process could more readily secure these rights. This raises a central question: to what extent did the removal of this politically mediated access to incorporation alter both the level and the composition of innovation?

## 2.2 Special Charters Were Not Negligble

The special charter system was not a marginal or transitory institutional arrangement. It was the dominant mechanism through which corporations were formed throughout most of the nineteenth century, and therefore a central feature of the economic environment in this period.

Figure 1 shows the evolution of special charter issuance between 1790 and 1860. The

number of charters issued annually increased substantially over time, particularly in the decades leading up to the Civil War, tracking the expansion of the American economy and the growing demand for corporate organization.

Issuance peaked in the mid-1830s: in 1836, the average state issued 39.6 charters, while states in the top decile issued as many as 149 charters in a single year. This surge was followed by a sharp contraction during the debt crisis of the early 1840s, with average issuance falling to 7.6 in 1840. In the subsequent recovery, chartering activity rebounded, reaching another peak of approximately 45 charters per state in 1850. This later period coincided with the initial adoption of legal restrictions on special charters in several states (e.g., Iowa in 1846, California in 1849, Michigan in 1850, and Indiana and Ohio in 1851), after which issuance began to decline. Because the dataset ends in 1860, it does not capture the full phase-out of special charters in the latter part of the century.

Importantly, this was not a short-lived or transitional phenomenon. Special charters remained widely used across states for decades, only gradually losing prominence toward the end of the nineteenth century. As a result, for the period studied in this paper, the special charter system constituted a pervasive institutional constraint, shaping who could access the corporate form and, by extension, who could participate fully in economic and innovative activity.

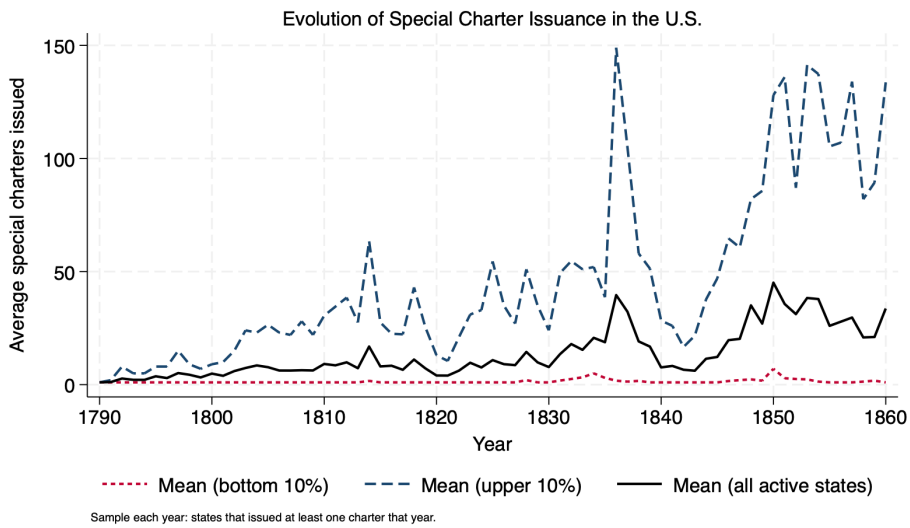



Figure 1: Evolution of Special Charters Issuance (1790–1860), Annual Issuance Averages

Average annual issuance of special charters, all states. Source: Wright (2015).

The composition of chartered activity further illustrates how deeply embedded the system was in the productive economy. Manufacturing charters—those most directly linked

to innovative activity—were rare at the beginning of the century but expanded rapidly as industrialization progressed. In the first decade of the dataset, manufacturing corporations accounted for only 3% of all charters. By 1850, their share had risen to roughly one quarter of total charters issued. A full sectoral breakdown is provided in Appendix A6.

This shift is critical for interpreting the economic consequences of the system. As special chartering penetrated manufacturing, political gatekeeping extended directly into the sectors where innovation was most likely to occur. Access to incorporation therefore shaped not only who could form firms, but who could effectively commercialize new ideas. Inventors without the ability to secure a charter faced a systematic disadvantage relative to chartered firms, which benefited from limited liability, access to pooled capital, and, in many cases, preferential legal treatment. In this environment, the returns to innovation were inherently unequal, tilted in favor of those with political access.

## 2.3 An Unequal System

There are strong reasons to believe that access to special charters was unevenly distributed. The institutional design of the system itself created barriers to entry. Obtaining a charter required direct engagement with state legislatures, a process that depended on personal access, political influence, and the ability to navigate formal and informal channels of power. In practice, most individuals in the nineteenth-century United States lacked the connections necessary to approach senior political actors and secure legislative approval, while a small, well-positioned minority could do so repeatedly.

Because special charters typically carried substantial economic value, they also created opportunities for political extraction. Legislators controlled a scarce and valuable privilege, and contemporary observers described charter issuance as a negotiated exchange. As characterized in Wallis (2004), the system amounted to "selling monopoly privileges for revenue, inevitably requiring a price, a negotiation, a bargain." Wright (2009) similarly notes that obtaining a charter required "large amounts of time, effort, and money, including the cost of lobbyists and bribes." Hilt emphasizes that incorporation under the special charter regime was fundamentally a political process: legislatures exercised discretionary control over access to corporate status, making incorporation contingent on political connections and bargaining rather than on transparent or general legal criteria (Hilt, 2017a). These accounts point to a system in which economic advantage was closely tied to political access rather than open competition.

This unequal structure is also emphasized by Lamoreaux and Wallis (2020), who argue that "because some people, groups, and localities were better positioned than others to obtain favors from the legislature, this system of special laws was fundamentally inegalitarian. Indeed, it was precisely because it was inegalitarian that it persisted." Cross-state quantitative evidence highlights the scale of the discretionary regime. States that did not adopt general incorporation statutes issued more than twice as many special charters per capita as states that adopted general laws, a difference that is statistically significant (Hilt, 2017a). This pattern underscores how central legislative chartering remained in non-reform states and illustrates the magnitude of economic activity that continued to

depend on discretionary political approval. The persistence of such a system reinforced concentration of opportunity among politically connected actors and slowed the transition toward a more open and competitive corporate environment.

## 2.4 The Privileges of Special Charters

The primary privileges granted by special charters were those inherent to the corporate form itself. These included limited liability, entity shielding, the ability to raise capital through equity and bonds, and the capacity to trade securities in secondary markets (Wright (2009), Lamoreaux and Wallis (2020)). Even when explicit monopoly clauses were absent, incorporation conferred a substantial competitive advantage over unincorporated firms. Businesses that failed to obtain charters were typically restricted to proprietorship or partnership forms, organizational structures that were both riskier and more limited in scale.[1]

Formal monopoly rights were rarely written into charters. Yet the absence of explicit exclusivity did not imply open competition. As Hurst (1970) explains, "Explicit monopolies, or protections against competition, were rare. Most often grantees obtained a practical monopoly in greater or less degree because legislators would not multiply a given kind of grant or because the profitable opportunities in a given area of trade or service were practically so limited that the first-chartered groups preempted the field." In practice, early recipients enjoyed a powerful incumbent advantage. Legislators frequently refrained from issuing additional charters in the same locality or sector once a firm was already operating, reasoning that no further entry was necessary. The result was a system in which first movers could secure durable market dominance even without formal legal exclusivity. Contemporary observers recognized these privileges as functionally equivalent to monopoly power. As Hilt (2017b) notes, "given that most early entrepreneurs could never hope to obtain a charter for their business, these powers were seen as a form of monopoly that infringed on the rights of ordinary citizens." The economic value of a charter therefore extended beyond legal form; it shaped market structure, entry conditions, and the distribution of opportunity within emerging industries.

## 2.5 Public Sentiment and the Process of Prohibition

Public criticism of special charters emerged early and persisted throughout the nineteenth century. Opposition reflected both a broader anti-corporate sentiment present in parts of early American political culture and dissatisfaction with the visibly unequal way in which charters were distributed (see Hurst (1970)). Many historians link anti-charter agitation to the rise of Jacksonian Democracy following Andrew Jackson's first presidential campaign in 1824. The movement's emphasis on equality before the law and hostility toward monopoly privilege aligned naturally with opposition to discretionary chartering. Empirical evidence supports a political connection: Hilt (2017a) documents that when general incorporation statutes were enacted, 67% of adopting states had Democratic majorities in their upper legislative houses, 57% had Democratic lower houses, and 48% had unified Democratic control. Yet the relationship between party control and institutional reform was not straightforward. A simple comparison of adoption timing does not reveal a clear pattern in

1. Unincorporated businesses existed but were relatively few in number during this period (Wright (2009)).

which Democratic-leaning states systematically passed general incorporation laws earlier than others (see figure A10 in the appendix). In practice, the charter system served political and economic elites across party lines. The persistence of special charters appears to have reflected incentives rather than ideology. As Hamill (1999) argues, Jacksonian rhetoric framed incorporation as a question of equality, but the mechanics of charter allocation created benefits that politicians of all affiliations were reluctant to relinquish. Lamoreaux and Wallis (2020) capture this dynamic succinctly: "those in power benefited from the ability to dispense charters for banks and other valuable economic organizations. Those out of power complained bitterly about this 'corruption', but they behaved in exactly the same way when they were in office, favoring supporters and freezing out opponents. To do otherwise would be to risk losing control of the government and, with that, access to banks and similar advantages. Despite the discontent the system generated, therefore, it was remarkably persistent." The prohibition of special charters thus emerged not from a simple partisan shift, but from a gradual breakdown of a political equilibrium that had long sustained discretionary privilege.

The transition away from special charters was gradual and unfolded over several decades, even though reform was rarely designed as a phased process. As charters came to occupy a larger share of corporate activity and opposition intensified, states began introducing general incorporation statutes that allowed firms to organize without individualized legislative approval. With the exception of New York — which enacted a general incorporation statute in 1811[2] — the first adopters were Pennsylvania in 1836 and Connecticut in 1837. Over the following decade six additional states[3] passed similar legislation, and fifteen more followed in the subsequent decade. By 1859, twenty-four of the twenty-eight existing states had enacted general incorporation laws. As expected, corporate formation under general statutes increased substantially during this period. Yet the adoption of general incorporation did not immediately eliminate discretionary chartering. States continued to issue special charters alongside general registration (see figure A11 in the appendix), preserving a dual institutional regime in which privileged and open access forms coexisted. In many cases the special form retained economic advantages (Lamoreaux and Wallis (2020), Hilt (2017a)), raising the question of whether the new legal framework meaningfully leveled the playing field. The consequences of this dual period remain debated. Hamill (1999) argues that continued reliance on special charters often reflected institutional inertia rather than clear economic superiority, while other scholars contend that special acts frequently conferred advantages that sustained the earlier inegalitarian structure. The coexistence of the two regimes therefore prolonged the political and economic tensions surrounding incorporation rather than resolving them immediately.

Regardless of whether special charters retained real economic advantages during the dual period, most states ultimately concluded that partial reform was insufficient and moved to prohibit the practice explicitly. Iowa became the first state to enact a formal prohibition in 1846[4]. California followed in 1849, and Michigan, Ohio, and Indiana adopted equivalent bans in 1850, 1851, and 1851, respectively[5]. These early adopters were joined several years

2. Details on New York's special case are discussed in Hilt (2017a).
3. Michigan, Ohio, New Jersey, Iowa, Louisiana, and Wisconsin.
4. See the banking crisis in Iowa as background (Jr. (1928)).
5. Indiana and Michigan's cases are discussed further in the case study section.

later by Minnesota and Oregon (1858 and 1859). Six additional states enacted prohibitions in the following decade, and eight more did so in the decade after that (see table 18 in the appendix for the full list). By the end of the nineteenth century, explicit bans on special charter issuance had become the dominant legal framework across the United States.[6]. These prohibitions produced a measurable decline in charter activity and marked the institutional end of the special charter era (see figure A12 in the appendix). As documented by Hamill (1999), annual issuance fell from roughly 1,000 charters between 1887 and 1893 to 400 between 1894 and 1903, declined further to 180 between 1904 and 1915, and dropped to only 32 per year between 1916 and 1975. By the late twentieth century the practice had nearly disappeared, averaging just seven charters annually between 1976 and 1996. Hamill identifies 1904 as the point at which special charters effectively ceased to provide meaningful access to the corporate form, marking the practical completion of the transition.

### 2.5.1 Prohibition of Special Charters as the Treatment

A natural question is why we define the treatment as the prohibition of special charter issuance, rather than the earlier adoption of general incorporation laws. At first glance, general incorporation appears to be the key institutional innovation, as it allowed firms to incorporate without individualized legislative approval. However, both historical evidence and quantitative patterns indicate that the adoption of general incorporation, while removing formal barriers to incorporation, did not level the playing field, as special charters continued to offer more advantageous terms to politically connected actors.

The key distinction is that general incorporation expanded access *in principle*, but did not equalize access *in practice*. In most states, the introduction of general incorporation created a dual institutional regime in which firms could either incorporate under standardized general statutes or seek special charters through the legislature. Because these two forms were not equivalent, the continued availability of special charters preserved a system in which politically connected individuals could obtain more advantageous corporate privileges.

Historical evidence strongly supports this interpretation. Early general incorporation laws were often restrictive, imposing limits on firm activities, capital structure, and governance. As a result, firms frequently continued to seek special charters even after general incorporation became available. For example, in Pennsylvania, five years after the passage of the 1849 general incorporation law for manufacturing, fewer than a dozen firms had incorporated under the general statute, while in 1855 alone the legislature issued 196 special charters. Lamoreaux and Novak (2017) suggested that "because early general incorporation laws were so restrictive, businesses continued to petition the legislature for special charters in the hopes of securing better terms." This revealed preference indicates that general incorporation was not a perfect substitute for special charters. Additional evidence shows that special charters often conferred meaningful economic advantages. These

6. Seven states never enacted formal prohibitions — New York, Connecticut, Rhode Island, Massachusetts, Maryland, Maine, and New Hampshire — likely because general incorporation had already made special charters obsolete in practice. More on this in the following section.

could include broader permissible activities, greater flexibility in financial structure, and exemptions from regulatory constraints. As a result, even when general incorporation was available, firms with political access could secure superior organizational forms. In this environment, access to incorporation remained unequal: entrepreneurs without political connections were effectively confined to a less advantageous legal regime, while connected actors continued to benefit from discretionary privileges.

The persistence of special chartering alongside general incorporation also had measurable aggregate consequences. Lamoreaux and Wallis (2020) compare states that adopted general incorporation but continued to allow special charters with states that went further and prohibited them. Their evidence shows that Ohio, which banned special charters in 1851, experienced substantially greater incorporation activity than states such as New Jersey and Pennsylvania, which had adopted general incorporation laws but did not prohibit special charters until later. In the decade following the Civil War, Ohio chartered 2.2 times more corporations under its general law than New Jersey did under both its general and special regimes combined. Only after New Jersey prohibited special charters in 1875 did this gap begin to close. This pattern suggests that the continued existence of special charters constrained entry even in the presence of general incorporation.

More broadly, the political economy of the system reinforces this interpretation. As long as special charters remained available, legislatures retained the ability to allocate valuable economic privileges. Historical accounts consistently describe chartering as a process shaped by political connections, bargaining, and, at times, outright payments. In such a setting, the introduction of general incorporation did not eliminate political allocation; it merely created an additional, less advantageous channel for incorporation. Only the prohibition of special charters removed the discretionary margin entirely, forcing all firms to operate under uniform legal rules.

Finally, the widespread adoption of explicit prohibitions on special charters provides direct evidence that policymakers themselves viewed general incorporation as insufficient. Beginning in the 1840s and continuing through the late nineteenth century, most states enacted constitutional or statutory bans on special legislation. This additional step would have been unnecessary if general incorporation had already leveled the playing field. Instead, the sequence of reforms suggests that states recognized the persistence of unequal access under the dual regime and acted to eliminate it.

We illustrate this logic directly in our own data. Using state-level counts of special charters issued each year, we plot annual issuance for every state that has both pre- and post-treatment observations in our 1830–1860 sample window, around each of the two potential treatments: (a) the first general-incorporation law and (b) the subsequent prohibition of special charters. For the first-law charts, each state's panel is truncated at its own prohibition year (where applicable) so that the post-first-law window cannot be contaminated by the later ban; states whose first law coincided with or post-dated the prohibition, as well as the seven states that never formally prohibited, are excluded from the prohibition charts because they have no well-defined treatment year (the same rationale as in the patents regression). The two sets of per-state bar charts are presented in Figure A1 (first law) and Figure A2 (prohibition). We rely on these raw-data visualisations rather

than on event-study regressions because the charter data end in 1860 and most states had not yet enacted either law by that date, leaving too small an identifying sample for a meaningful econometric specification; the per-state charts make the pre/post contrast visible on a state-by-state basis. [**PLACEHOLDER — to be filled in once the figures are in:** The first-law charts show that special-charter issuance [did not decline / declined only modestly / declined substantially] after the adoption of general incorporation, while the prohibition charts show [a sharp, immediate / a more gradual] break in issuance at the year of prohibition. This empirical pattern is [consistent with / provides direct support for] treating the prohibition, rather than the first general-incorporation law, as the relevant institutional shock in our main analyses.]

Taken together, this evidence indicates that the relevant institutional transition was not the introduction of general incorporation per se, but the elimination of discretionary chartering. The prohibition of special charters represents the point at which access to the corporate form became effectively open and uniform. For this reason, it is the appropriate treatment for studying the impact of institutional access on entrepreneurship and innovation.

### 2.5.2 Seven States Never Passing the Second Law

All U.S. states, with the exception of Alaska, enacted general incorporation statutes during the nineteenth century. As discussed above, almost all states later complemented these laws with explicit prohibitions on the issuance of special charters. For some jurisdictions, the gap between the adoption of general incorporation and the prohibition of special acts — the "dual period" — was lengthy. However, seven states — New York, Connecticut, Massachusetts, Maine, Maryland, Rhode Island, and New Hampshire — never enacted a formal statutory ban on special charters. Hamill (1999) suggests that this pattern is partly explained by early adoption of general incorporation. New York passed its statute in 1811, followed by Connecticut in 1837, Massachusetts in 1851, Maryland in 1852, Maine in 1862, and New Hampshire in 1866. As she notes, "these early proponents of equal access assumed that the mere existence of general incorporation laws would cure the evils of special privileges conferred by special corporate charters." In several of these states, later constitutional or statutory language attempted to restrict special acts but proved insufficiently binding. For example, New York's 1846 constitutional convention added a provision stating that "corporations may be formed under general laws; but shall not be created by special act except for municipal purposes, and in cases when in judgment of the legislature, the objects of the corporation cannot be attained under general laws." Despite this directive, legislators continued approving special charters by interpreting the exception broadly. Other states adopted similar language that ultimately failed to eliminate discretionary chartering.

Even without formal prohibition, reliance on special charters declined substantially over time. In Maine, incorporation by special legislation represented 86% of all incorporation in 1870 but fell to 18% by 1915. In Maryland the share declined from 21% in 1876 to 3% in 1915. In Massachusetts it dropped from 11% between 1875–1903 to 1% between 1904–1915. Connecticut saw a decline from 25% between 1840–1860 to 5% between

1904–1915. In New York, annual special charter issuance fell from 12 in 1875 to 4 in 1903, while 3,887 corporations were formed under general law in that same year.[7] These figures suggest that even absent an explicit statutory ban, special chartering became economically insubstantial by roughly the last quarter of the nineteenth century. In other words, the institutional transition away from discretionary chartering occurred in practice, but without a single discrete legal breakpoint that can be cleanly dated.

The precise reasons these states never enacted explicit prohibitions are difficult to identify conclusively. A plausible interpretation is that once general incorporation became the dominant mechanism and discretionary chartering faded nationally, lawmakers saw little need to codify a formal ban. From the perspective of this paper, however, the absence of a clear prohibition date poses an empirical challenge. Our identification strategy treats the enactment of a prohibition statute as the treatment shock. Because the decline of special charters in these seven states occurred gradually rather than through a discrete institutional break — and because no reliable year captures a comparable turning point — we exclude them from the main sample. This restriction ensures that treatment timing reflects a well-defined legal discontinuity rather than an imprecise institutional transition.

# 3. Data

## 3.1 Patents

We construct state-by-year patent counts from the United States Patent and Trademark Office (USPTO) annual reports of 1891 and 1920, available through the HathiTrust digital archive.[8] These reports contain aggregate information on the number of patents registered by inventors in each state for every year. We begin the sample in 1830, the first year for which complete state-level patent counts are consistently available. This starting point also precedes the earliest prohibition of special charters (Iowa, 1846), ensuring a sufficiently long pre-treatment period. The sample ends in 1920. By the early twentieth century special charters had largely lost practical relevance (Hamill (1999)), making later years less informative for the institutional transition studied here. In addition, 1920 provides a natural cutoff prior to the macroeconomic disruptions associated with the Great Depression. Results are robust to alternative sample windows.[9]. To construct per capita measures, we combine patent counts with decennial state population figures and interpolate annual population using geometric interpolation. This allows us to express innovation outcomes in comparable per-capita terms across states and over time.

Patent protection under the USPTO is federally administered and geographically uniform. A patent granted to an inventor in one state confers the same legal scope as a patent granted in any other state. Because protection does not vary across jurisdictions, inventors have little incentive to register patents outside their home state for strategic reasons. This institutional feature reduces concerns that observed state-level patent counts reflect legal positioning rather than the true location of inventive activity, strengthening

7. Sources: George Heberton Evans (1948), Hamill (1999).
8. https://babel.hathitrust.org/cgi/mb?a=listis;c=503653486
9. Robustness tests show that varying the start and end years does not materially affect the estimates.

the interpretation of the data as a measure of where innovation occurred.

The USPTO's published aggregates report 1,305,740 patents attributed to U.S. states for the period 1830–1920. The Berkes dataset identifies 1,301,933 patents over the same period. However, due to limitations of the OCR process, micro-level characteristics such as inventor names are successfully recovered for only 612,855 of these patents. Consequently, for exercises that rely on inventor-level information, we use this subset of patents for which the micro-level variables are available.[10]

## 3.2 Special Charters

Granular data on special charters are drawn from Wright (2015). This dataset contains detailed information on more than 22,000 special charters issued by U.S. state legislatures between 1790 and 1860. It is widely regarded as covering the universe, or at least the vast majority, of special charters granted during this period. The dataset reports a rich set of variables, including the state and date of issuance, the name of the corporation, the names of incorporators and stock subscription agents, the location of the business, the type of economic activity, and a variety of corporate privileges and constraints (such as minimum and maximum authorized capital and elements of the firm's capital structure).

A limitation of the dataset is that it ends in 1860. Comparable systematic data on special charters issued after this date have not been assembled. Moreover, comprehensive aggregate data on firms formed under general incorporation laws are largely unavailable for the nineteenth century. While some partial collections exist—for example, George Heberton Evans (1948) compiles information on selected incorporated firms—no dataset comparable in scope to the special charters records currently exists for firms formed under general incorporation.

Finally, some evidence suggests that a portion of economic activity during this period occurred outside the corporate form, through sole proprietorships or partnerships that did not operate under either special charters or general incorporation statutes (Wright, 2009). However, existing historical research indicates that such entities were generally smaller and less economically significant than chartered corporations, suggesting that their omission is unlikely to substantially affect the analysis.

## 3.3 Political Affiliation

To control for political conditions at the state level, we construct a measure of each state's political affiliation using historical election returns compiled by Leip (2020). These data report detailed vote totals by political party for state-level elections. Using these returns, we create a state-by-year measure of political affiliation equal to the share of votes cast for parties classified as Democratic. Because nineteenth-century party systems were fluid and party labels evolved over time, we manually classify political parties into Democratic-

10. The creator of the dataset does not report any evidence suggesting that the recovered subset is systematically biased.

and Republican-aligned groups based on their historical affiliation. This classification is necessarily imperfect, as party alignments during parts of the nineteenth century were not always clearly comparable to modern partisan categories. Nevertheless, this approach allows us to construct a consistent proxy for the political orientation of each state over time. The resulting variable captures the proportion of votes cast for Democratic-aligned parties in each state election and is used as a control for time-varying political conditions in the empirical analysis.

# 4. Research Design

We estimate treatment effects using a two-stage event-study approach following Gardner et al. (2024), which addresses biases that arise in settings with staggered treatment adoption and heterogeneous treatment effects across groups and over time. This framework is well suited to our setting, where states adopt general incorporation laws at different points in time. In the first stage (equation 1), we regress the outcome variable on state fixed effects, year fixed effects, region-by-year fixed effects, and time-varying state-level controls using only observations that have not yet been treated. Restricting the estimation sample to untreated observations ensures that the coefficients on these controls are not contaminated by treatment effects when treatment adoption is staggered. In the second stage (equation 2), we regress the residuals from the first-stage regression on the treatment indicators to estimate dynamic treatment effects for each event-time period. This procedure yields consistent event-study estimates of the causal impact of the transition from special charters to general incorporation.

$$y_{i,t} = \alpha_i + \lambda_t + \gamma_i \lambda_t + X_{i,t} + u_{gpit} \tag{1}$$

$$\text{for } D_{gp} = 0$$

$$u_{gpit} = \sum_{k \neq -1} \beta_k D_{i,t}^{(k)} + \epsilon_{i,t} \tag{2}$$

Where $y_{i,t}$ denotes patents per capita in state $i$ in year $t$, $\alpha_i$ are state fixed effects, $\lambda_t$ are year fixed effects, and $\gamma_i$ denotes state $i$'s region[11], so that $\gamma_i \lambda_t$ captures regionyear fixed effects, and $X_{i,t}$ is a set of state-level controls. $D_{i,t}$ is a dummy variable indicating whether state $i$ had already been treated by year $t$ (i.e., had passed a law prohibiting the issuance of special charters). $\beta_k$ is the estimated ATT $k$ periods before or after treatment. and $\epsilon_{i,t}$ is the error term.

## 4.1 Identification Threats

The primary identification concern in this setting is that states may have adopted general incorporation laws endogenously. In particular, states experiencing greater economic development or innovative activity may have been more likely to prohibit the issuance of

11. Four regions: Northeast, South, Midwest, and West

special charters, potentially biasing estimates of the effect of the reform on innovation.

Several pieces of evidence suggest that this concern is unlikely to drive our results. First, historical accounts indicate that the transition away from special charters was typically a gradual and politically complex process. Although all states eventually moved toward general incorporation, the timing of these reforms differed widely and often reflected idiosyncratic political and institutional dynamics rather than contemporaneous economic conditions.

Second, as shown in the event-study estimates presented below, there is no evidence of differential pre-trends in patenting prior to the adoption of general incorporation laws. The absence of systematic increases in innovation before treatment suggests that states were not adopting these reforms in response to rising innovative activity. This pattern is consistent across all specifications we estimate.

Third, we conduct a case-study analysis focusing on nine states where the adoption of general incorporation laws can plausibly be considered exogenous to local innovation dynamics. The results from these cases closely mirror the baseline findings, further supporting the interpretation that the observed increases in innovation reflect the causal effects of expanding access to incorporation. Additional details are provided in the case-study section.

# 5. Results

## 5.1 Quantity of Patents

The main result of the paper is illustrated in Figure 2, which presents the event-study estimates for patents per capita. There is no evidence of a systematic increase or decline in patenting in the ten years preceding the reform. The absence of differential pre-trends supports the view that the timing of the transition away from special charters was not driven by prior changes in innovative activity. Table 1 presents the baseline regression, where the estimated ATT is 10.8 patents per 100,000 population, along with a series of robustness checks.

One potential concern is that the reform may have attracted immigrants to treated states, particularly during a period in which the United States experienced large waves of international immigration. If newly arrived immigrants were disproportionately responsible for the observed increase in patenting, the estimated treatment effect could partly reflect changes in population composition rather than increased innovative activity among individuals already residing in those states. To address this concern, we repeat the analysis while down-weighting inventors who are less likely to have been born in the United States. Although this exercise does not address the possibility of inter-state migration after the reform, it allows us to test whether the main results are driven by an influx of foreign-born inventors.

To classify inventors by likely birthplace, we use IPUMS decennial census microdata, in which respondents report both their first names and country of birth. For each first name

and each census decade, we compute the share of individuals bearing that name who were born in the United States, along with a 95% Wilson confidence interval. We then match each patent to the most recent census year preceding it, so that a patent filed in 1856 is matched to the name distribution observed in the 1850 census. This time-varying approach accounts for the fact that immigration waves changed the composition of name bearers over time: a name that was predominantly held by the native-born in 1850 may have become common among immigrants by 1900.

The match rate between inventor first names and the census data is high: between 85% and 97% (varies by decade). We therefore lose relatively little data through the matching procedure. Among matched patents, the average estimated probability of being U.S.-born is 84%, and for over 96% of inventor–patent observations the name is more likely American than foreign, consistent with the expectation that the vast majority of inventors in this period were native-born.

Rather than imposing an arbitrary threshold to classify names as "American" or "foreign," we use the estimated probability of U.S. birth as a continuous weight. Specifically, each inventor–patent observation is weighted by the product of the census-year-specific probability of being U.S.-born and the number of census observations for that name in that decade. The latter term ensures that names whose Americanness is estimated more precisely receive greater weight. Weights are normalized so that their mean equals one, placing the weighted patent count on the same scale as the raw count and yielding an outcome variable interpretable as patents per 100,000 population.

Figure 3 presents the event-study estimates from this probability-weighted specification. The point estimates are somewhat larger than those in the baseline, though also noisier, reflecting the smaller effective sample size once observations are down-weighted by their probability of being U.S.-born. The overall pattern remains consistent with the baseline, indicating that the main findings are not driven by foreign-born inventors entering treated states after the reform. If anything, the larger coefficients suggest that the treatment effect may be slightly stronger among native-born inventors.

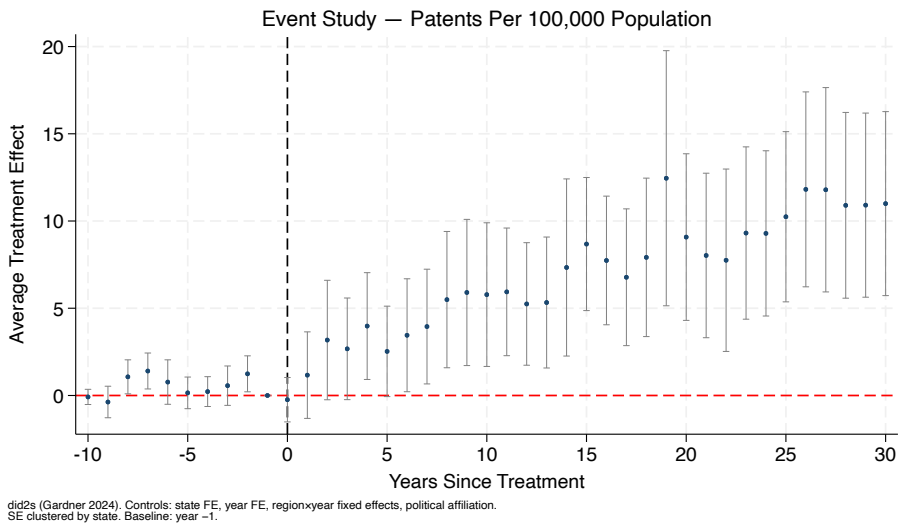



Figure 2: Event Study - Patents Per Capita

Gardner et al. (2024) event-study regression where the year a state passed the law prohibiting the issuance of special charters by the state is the treatment variable. The x-axis is the relative time to treatment and the y-axis is the increase in patents per 100,000 population for the treated. Additional controls to state and year fixed effects are regionyear fixed effects and per-state political affiliation. Sample period is 1830-1920. Standard errors are clustered by state.

Table 1: Patents Regressions

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Treatment (SC law) | 10.83*** | 13.75*** | 4.51** | 9.20*** | 8.47*** | 3.16 | 6.50*** | 18.83*** | 10.59*** | 7.43*** | 3.82** |
| | (1.92) | (3.30) | (2.12) | (1.73) | (1.92) | (1.94) | (1.74) | (3.51) | (2.31) | (1.89) | (1.47) |
| Outcome mean (all years) | 15.93 | 13.63 | 17.02 | 18.35 | 20.25 | 14.10 | 12.24 | 13.63 | 16.07 | 16.38 | 15.93 |
| Sample | All | States 1830 | ≥1840 | ≥1850 | ≥1860 | ≤1910 | ≤1900 | States 1830 | 3y bins | 5y bins | All |
| Method | did2s | did2s | did2s | did2s | did2s | did2s | did2s | did2s | did2s | did2s | OLS |
| Weight | non-weighted | non-weighted | non-weighted | non-weighted | non-weighted | non-weighted | non-weighted | population weighted | non-weighted | non-weighted | non-weighted |
| Observations | 3,161 | 2,002 | 2,941 | 2,711 | 2,411 | 2,751 | 2,341 | 2,002 | 1,088 | 665 | 3,161 |

Outcome: patents per 100,000 population.
All columns include state FE, year FE, regionyear fixed effects, and political controls.
SE clustered by state. Sample: 1830–1920.
*States 1830*: states with positive population in 1830.

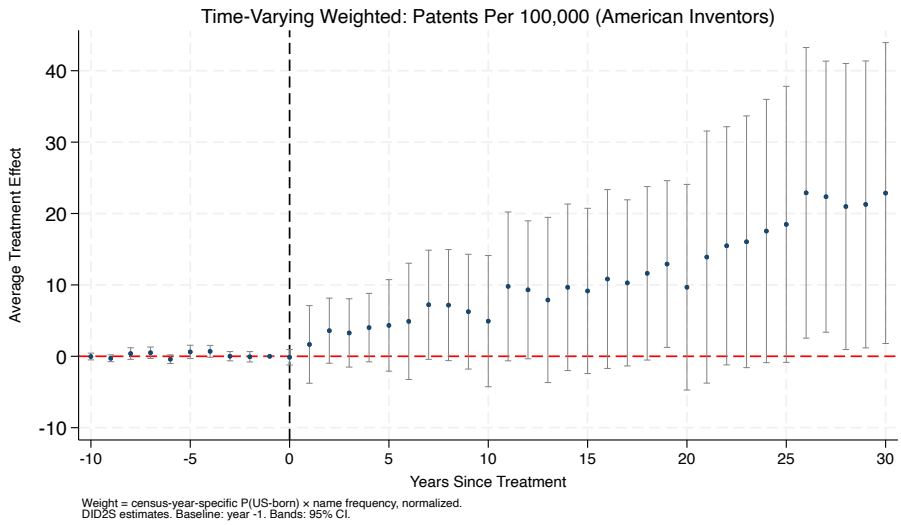



Figure 3: Event Study - Patents Per Capita (Only American Inventors)

Event-study estimates based on the two-stage difference-in-differences estimator of Gardner et al. (2024). Treatment is defined as the year in which a state adopted a law prohibiting the issuance of special corporate charters. The x-axis reports time relative to the treatment year, and the y-axis shows the estimated change in patents per 100,000 population for treated states. Each inventor–patent observation is weighted by the product of the census-year-specific probability that an individual with the inventor's first name was born in the United States and the number of census observations for that name in the relevant decade, using IPUMS decennial census microdata. Each patent is matched to the most recent census year preceding it, so that the Americanness measure reflects contemporaneous name composition. Weights are normalized to have a mean of one, preserving the per-capita scale of the outcome. All specifications include state and year fixed effects, region×year fixed effects, and controls for state political affiliation. The sample period is 1830–1920. Standard errors are clustered at the state level.

### 5.1.1 Patents, by Socioeconomic Rank of Inventors

To examine how the reform affected the socioeconomic composition of innovators, we assign each patent an inventor socioeconomic status (SES) rank based on the inventor's first name, using the first-name–SES mapping developed by Olivetti and Paserman (2015). For each first name and census decade, this mapping provides the average percentile rank of the father's occupational income among individuals bearing that name. We match each patent to the most recent census decade and divide inventors into five equal-width groups spanning the available rank range.

An important limitation of this approach is that the SES signal in first names is inherently noisy. While individual-level occupational income ranks are uniformly distributed by construction, the *name-level average* ranks are concentrated around 0.5 (Figure 4). This

occurs because the most common names—such as John, William, and James—are used across all social classes, so their average rank regresses toward the population mean. Only rare names, used predominantly by a single social stratum, can maintain extreme average ranks. Since common names account for the majority of the population, the population-weighted distribution of name-average ranks is heavily concentrated in the middle. The results of this exercise should therefore be interpreted as suggestive evidence about SES heterogeneity rather than precise estimates of rank-specific treatment effects.

As a consequence of this concentration, the raw level of patenting is substantially higher for the middle rank groups (Figure 5), simply because more people in the population bear names in that range. Because the groups differ in population size, comparing the level of patenting across them would be misleading. Instead, we estimate the treatment effect on the inverse hyperbolic sine (asinh) of patents per capita, which approximates a log transformation while accommodating zeros. The resulting coefficients are interpretable as approximate percentage changes, making them directly comparable across groups regardless of baseline levels.

Figure 6 presents the asinh event-study estimates for each SES rank group. Despite the limited discriminating power of name-based SES, the results suggest that the percentage increase in patenting following the reform was larger among inventors in the middle of the socioeconomic distribution than among those at the top. This pattern is consistent with the view that the special charter system restricted access to the corporate form for the broad middle class, and that the introduction of general incorporation laws removed this barrier. We note, however, that these findings are constrained by the resolution of the name-based proxy: because most inventors bear common names whose average SES rank clusters near the median, the exercise has limited power to detect differential effects at the extremes of the socioeconomic distribution.

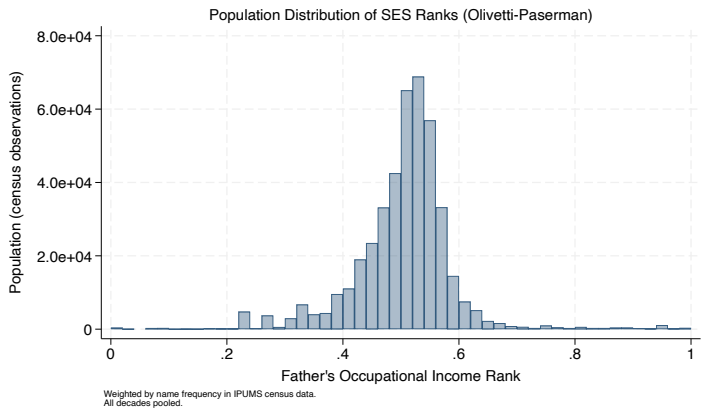



Figure 4: Population Distribution of SES Ranks

Distribution of father's occupational income rank across the population, using IPUMS census data weighted by name frequency (all decades pooled). SES ranks are from the first-name–SES mapping of Olivetti and Paserman (2015). The concentration around 0.5 reflects the fact that the most common names are used across all social classes.

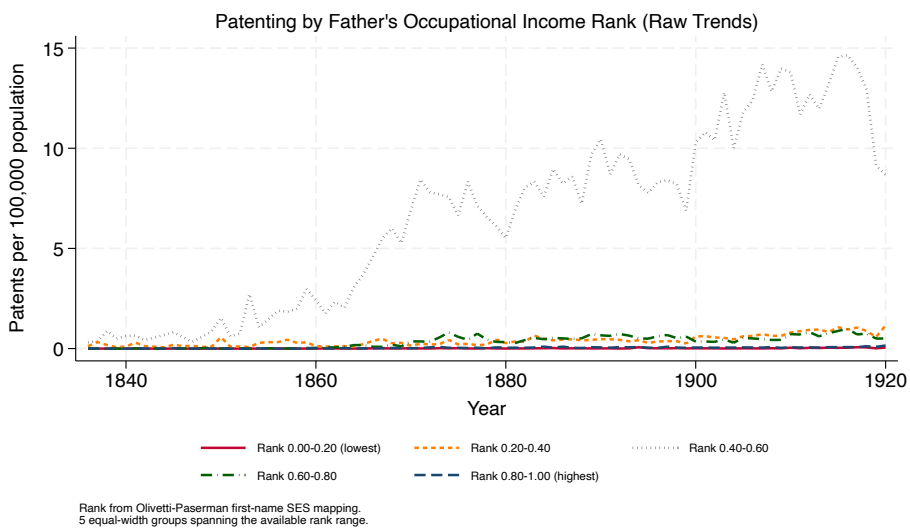



Figure 5: Patenting by SES Rank (Raw Trends)

Average patents per 100,000 population across all states, by SES rank group. The higher level of patenting in the middle rank groups reflects the larger population share of names in that range (see Figure 4), not a higher per-capita patenting rate.

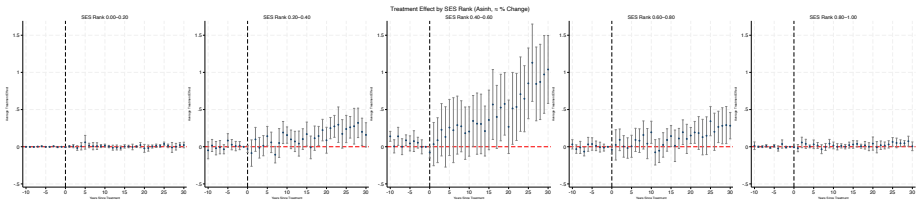


Figure 6: Event Study by SES Rank (Asinh, ≈ Percentage Change)

Gardner et al. (2024) event-study estimates with asinh(patents per 100,000) as the outcome. Coefficients are approximately interpretable as percentage changes, making them comparable across groups despite different baseline levels. SES ranks are from the first-name–SES mapping of Olivetti and Paserman (2015). Five equal-width groups spanning the available rank range. Controls: state FE, year FE, region×year FE, political affiliation. SE clustered by state. Sample: 1830–1920.

Table 2: Treatment Effect by SES Rank (Asinh)

| | (1) Rank 0.00-0.20 | (2) Rank 0.20-0.40 | (3) Rank 0.40-0.60 | (4) Rank 0.60-0.80 | (5) Rank 0.80-1.00 |
|---|---|---|---|---|---|
| Treatment (SC law) | 0.009** | 0.210*** | 0.646*** | 0.179*** | 0.029*** |
| | (0.005) | (0.029) | (0.140) | (0.042) | (0.008) |
| SES rank range | 0.00–0.20 | 0.20–0.40 | 0.40–0.60 | 0.60–0.80 | 0.80–1.00 |
| Observations | 2,728 | 2,728 | 2,728 | 2,728 | 2,728 |

Outcome: asinh(patents per 100,000). Coefficients ≈ % change.
Rank = father's occupational income rank (Olivetti & Paserman).
State FE, Year FE, Region×Year FE, political control.
SE clustered by state. Sample: 1830–1920.

## 5.2 Quality of Patents

### 5.2.1 Quality Of Patents, Measured By Future Citations

In order to measure the effect of the reform on the quality of patents, we examine the future citations received by patents, which are commonly used as a proxy for the technological importance of inventions. We construct a measure of total citations per 100,000 population using patent-level citation data from Kelly et al. (2020).

The results are presented in Figure 7, which shows the event-study estimates for total citations per 100,000 population. There is no evidence of a systematic increase or decline in citation-weighted innovation in the ten years preceding the reform, consistent with the absence of differential pre-trends in the baseline patenting results. Table 3 reports the corresponding regression estimates. The baseline specification yields an ATT of 4.9 citations per 100,000 population, indicating that the transition away from special charters increased not only the quantity of innovation but also its overall impact. The table also presents a series of robustness checks.

An important caveat is that our citation results capture the *extensive margin* of quality: the total stock of citation-weighted innovation per capita, rather than citations per patent. The reform raised the number of patents and therefore, mechanically, raises aggregate citations even if the average quality of each individual patent were unchanged. When we estimate the effect on citations per patent—the intensive margin—the estimates are not statistically significant. This pattern is consistent with an interpretation in which the reform primarily broadened participation in innovation, drawing in a larger pool of inventors whose patents were of comparable average quality to those produced under the special charter regime. The overall stock of high-impact innovation grew because more people were inventing, not because the average patent became more impactful. We view this as informative about the mechanism: the barrier imposed by the special charter system constrained the *number* of innovative actors rather than the quality of inventions produced by those who were already active.

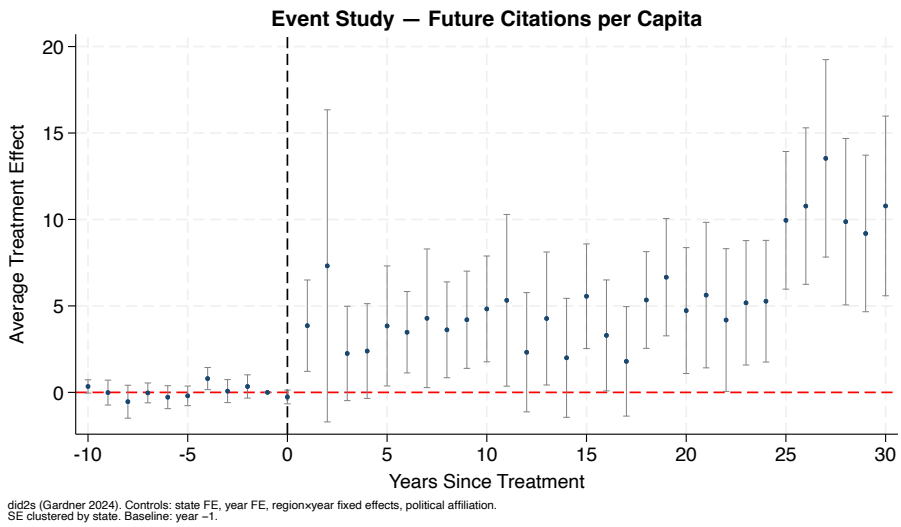



Figure 7: Event Study - Future Citations Per 100,000 Population

Gardner et al. (2024) event-study regression where the year a state passed the law prohibiting the issuance of special charters by the state is the treatment variable. The x-axis is the relative time to treatment and the y-axis is the increase in patents citations per 100,000 population for the treated. Additional controls to state and year fixed effects are regionyear fixed effects and per-state political affiliation.

Table 3: Quality of Patents, Measured By Future Citations - Regressions Table

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) |
|---|---|---|---|---|---|---|---|---|---|---|
| Treatment (SC law) | 5.03*** | 4.69*** | 7.55*** | 7.44*** | 5.45*** | 0.87 | 4.19** | 10.22*** | 6.30*** | 6.92*** |
| | (1.53) | (1.46) | (2.03) | (1.89) | (1.76) | (1.68) | (2.09) | (2.02) | (1.68) | (1.52) |
| Outcome mean (all) | 11.00 | 8.73 | 11.18 | 11.93 | 12.98 | 8.59 | 6.49 | 8.73 | 10.84 | 11.13 |
| Sample | All | States 1830 | ≥1840 | ≥1850 | ≥1860 | ≤1910 | ≤1900 | States 1830 | 3y bins | 5y bins |
| Method | did2s | did2s | did2s | did2s | did2s | did2s | did2s | did2s | did2s | did2s |
| Weight | non-weighted | non-weighted | non-weighted | non-weighted | non-weighted | non-weighted | non-weighted | population weighted | non-weighted | non-weighted |
| Observations | 2,785 | 1,741 | 2,739 | 2,563 | 2,319 | 2,375 | 1,971 | 1,741 | 1,014 | 631 |

Outcome: total future citations per 100,000 population.
State FE, Year FE, RegionYear Fixed Effects, political control included.
SE clustered by state. Sample: 1830–1920.

### 5.2.2 Quality of Patents, Measured By Breakthroughs

To further examine the effect of the reform on the quality of innovation, we analyze the incidence of breakthrough patents as defined by Kelly et al. (2020). These authors identify technologically important patents using a text-based measure of patent importance derived from the similarity of a patent's text to prior and subsequent inventions. In their framework, patents that are relatively distinct from prior technologies but closely related to subsequent innovations receive high importance scores, and breakthrough innovations are defined as patents that lie in the right tail of this importance distribution. Using this classification, we construct a measure of breakthrough patents per 100,000 population.

Figure 8 presents the corresponding event-study estimates. As in the previous specifications, there is no evidence of systematic changes in breakthrough innovation in the ten years preceding the reform. Table 4 reports the regression estimates and robustness checks. The baseline specification yields an ATT of 6.9 breakthrough patents per 100,000 population, indicating that the transition away from special charters increased not only the quantity of innovation but also the likelihood of producing highly influential inventions. As with the citation results, these findings reflect the *extensive margin*: the total number of breakthrough patents per capita, rather than the share of patents that qualify as breakthroughs. When we estimate the effect of the reform on the breakthrough rate—breakthrough patents as a fraction of all patents—the estimates are not statistically significant. The reform therefore raised the aggregate stock of breakthrough innovation by expanding the number of inventors and patents, rather than by shifting the composition of patents toward higher-impact discoveries. This interpretation is consistent with our broader findings: the special charter system suppressed the volume of innovative activity among non-connected actors, and its removal primarily widened the pool of innovators rather than changing the technological character of what any given inventor produced.

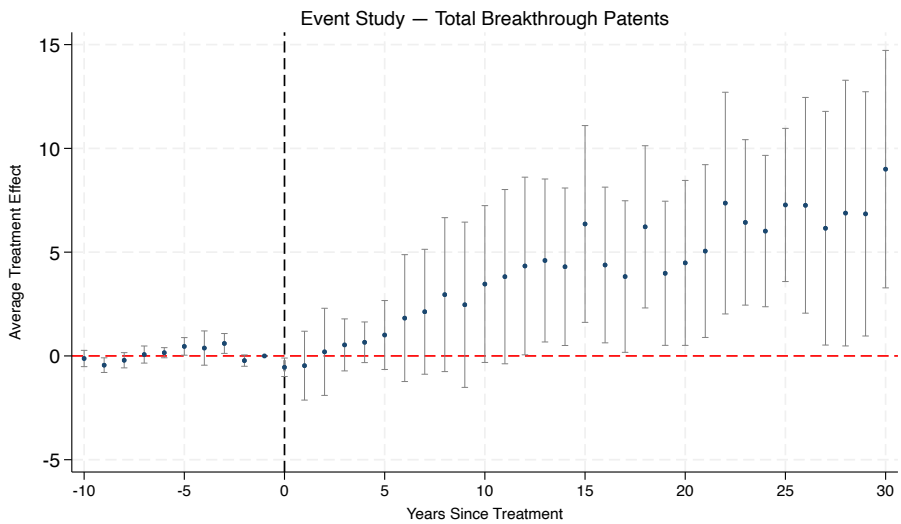



Figure 8: Event Study - Total Breakthroughs

Gardner et al. (2024) event-study regression where the year a state passed the law prohibiting the issuance of special charters by the state is the treatment variable. The x-axis is the relative time to treatment and the y-axis is the increase in total patent breakthroughs, as defined by Kelly et al. (2020), for the treated. Additional controls to state and year fixed effects are regionyear fixed effects and per-state political affiliation.

Table 4: Quality of Patents, Measured By Breakthroughs - Regressions Table

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) |
|---|---|---|---|---|---|---|---|---|---|---|
| Treatment (SC law) | 6.87*** | 11.79*** | 6.30*** | 5.86*** | 7.53*** | 3.27** | 2.39 | 23.38*** | 8.67*** | 9.40*** |
| | (2.40) | (3.80) | (2.05) | (1.93) | (2.08) | (1.65) | (1.76) | (6.02) | (2.42) | (2.44) |
| Outcome mean (all) | 6.94 | 9.55 | 7.06 | 7.55 | 8.07 | 5.11 | 4.43 | 9.55 | 6.66 | 6.73 |
| Sample | All | States 1830 | ≥1840 | ≥1850 | ≥1860 | ≤1910 | ≤1900 | States 1830 | 3y bins | 5y bins |
| Method | did2s | did2s | did2s | did2s | did2s | did2s | did2s | did2s | did2s | did2s |
| Weight | non-weighted | non-weighted | non-weighted | non-weighted | non-weighted | non-weighted | non-weighted | population weighted | non-weighted | non-weighted |
| Observations | 2,861 | 1,741 | 2,810 | 2,608 | 2,358 | 2,451 | 2,047 | 1,741 | 1,060 | 669 |

Outcome: total breakthrough patents.
Breakthroughs as defined by Kelly et al. (2020), using 10-year windows.
State FE, Year FE, RegionYear Fixed Effects, political control included.
SE clustered by state. Sample: 1830–1920.

## 5.3 Political Connectedness

We next examine whether the transition from special charters to general incorporation differentially affected individuals with prior access to political privileges. The central premise of the paper is that special charters were not broadly accessible, but rather allocated to a relatively narrow and politically connected set of individuals. If this is the case, then the abolition of special charters should have expanded access to incorporation for those previously excluded, leading to a relative increase in entrepreneurial activity and innovation among less connected individuals.

To study this mechanism, we leverage a comprehensive dataset of special charters granted between 1790 and 1860 (Wright (2015)). Using the names of incorporators listed in these charters, we construct, for each state, a list of surnames associated with charter recipients. We classify as "connected" all surnames that appear at least once among special charter incorporators within a given state. The "non-connected" group consists of surnames that appear in their state's IPUMS decennial surveys (1% sample) but not on their state's special charters recipients list. This framework allows us to compare how innovation outcomes evolve over time for individuals with differing degrees of prior access to the chartering process. We then estimate event-study specifications separately for the connected and non-connected groups, focusing on changes in patenting activity around the adoption of general incorporation laws. If special charters indeed conferred a meaningful advantage, we would expect the removal of this system to be associated with a decline in patenting among the connected group, as the privileged access they previously enjoyed is eliminated.

The results of this exercise are presented in Figure 9. Patenting among the connected group appears to be gradually decreasing over time following the reform, which is consistent with the hypothesis that politically connected individuals benefited from the special charters system and lost this advantage once general incorporation became available. However, the effect on the non-connected group is not strong—the estimates hover around zero for most of the post-treatment period, with only a modest increase appearing at longer horizons.

Given that we have established that total patenting per capita increased very significantly following the reform, this result carries an important implication: much of the growth in patenting must be attributable to surnames that were not prevalent in the IPUMS 1% samples used to define the non-connected group. These could reflect either (a) individuals who resided in the state during the pre-treatment period but happened not to appear in the 1% IPUMS sample—and thus were never classified as non-connected despite being present—or (b) individuals who arrived after the reform, whose surnames therefore do not appear on the pre-treatment non-connected list. Given the inherent limitation of working with 1% population samples, we have no way of distinguishing between these two explanations. Nevertheless, the declining trend for the connected group provides suggestive evidence that those with prior access to special charters experienced a relative loss following the transition to general incorporation.

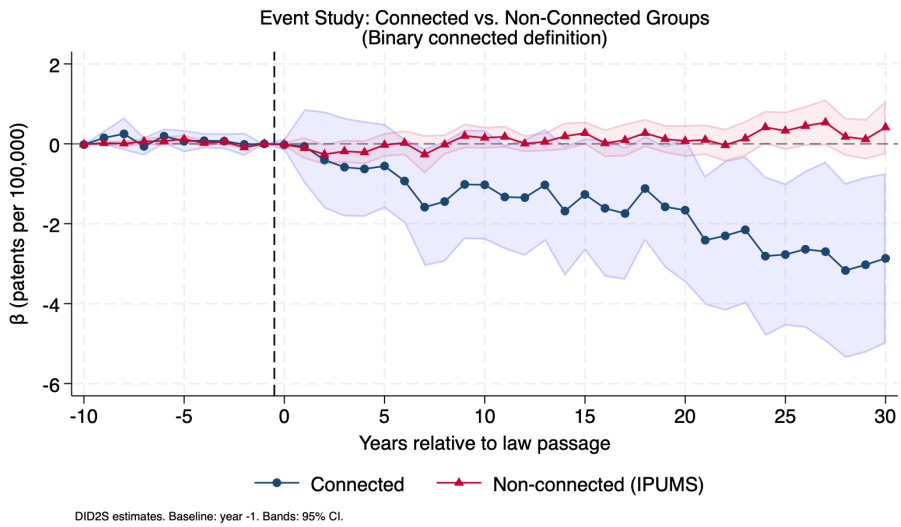



Figure 9: Event-Study Estimates by Political Connectedness

This figure presents event-study estimates comparing patenting outcomes for politically "Connected" and "Non-connected" groups. The "Connected" group is defined as surnames which appear in their state's special charters recipients list. The "Non-connected" group are surnames which appear in their state's IPUMS decennial surveys (1% sample), but not on their state's special charters recipients list. All estimates are based on a two-stage difference-in-differences specification with state and year fixed effects, regionyear fixed effects, and controls for political affiliation. The outcome variable is patents per 100,000 population. Standard errors are clustered at the state level.

## 5.4 Surname Diversity

To examine whether the reform affected the diversity of individuals participating in innovation, we construct a surname diversity index based on the surnames of patent inventors. If the recipients of special charters were drawn from a relatively small group of individuals, as one might expect in such a setting, the transition to general incorporation should also lead to an increase in the diversity of individuals participating in entrepreneurial activity and patenting.

Specifically, we compute a Shannon (1948) diversity index using inventors' surnames, where higher values indicate a more diverse distribution of inventors across surnames within a state-year. This measure captures the extent to which patenting activity is concentrated among a small number of family names or spread more broadly across the population. Figure 10 presents the corresponding event-study estimates for the surname diversity index. Consistent with the previous results, there is no evidence of systematic changes in surname diversity in the ten years preceding the reform. Table 5 reports the regression estimates and robustness checks. The baseline specification yields an ATT of 1.3, indicating that the transition away from special charters was associated with an in-

crease in the diversity of individuals participating in innovation. Additional robustness exercises for the surname diversity results are presented in the appendix (Figure A4).

As in the patents per capita exercise, we also repeat the analysis while down-weighting inventors who are less likely to have been born in the United States, using the same time-varying probability-weighted approach described in Section 3. Each inventor–patent observation is weighted by the product of the census-year-specific probability of being U.S.-born and the number of census observations for that name in the relevant decade. The corresponding results are presented in Figure 11 and remain materially similar to the baseline estimates.

As an additional exercise, Table 6 replicates the analysis using surname data from the IPUMS census, capturing the distribution of surnames in the general population rather than among inventors. This serves as a placebo test: while we expect the reform to increase surname diversity among inventors, there is no clear reason to expect a similar change in the overall population. Consistent with this interpretation, we find no evidence of a significant effect on surname diversity in the IPUMS data. This result strengthens the interpretation of our main findings, suggesting that the increase in surname diversity is driven by broader participation in innovation, rather than by underlying changes in the composition of surnames in the population.

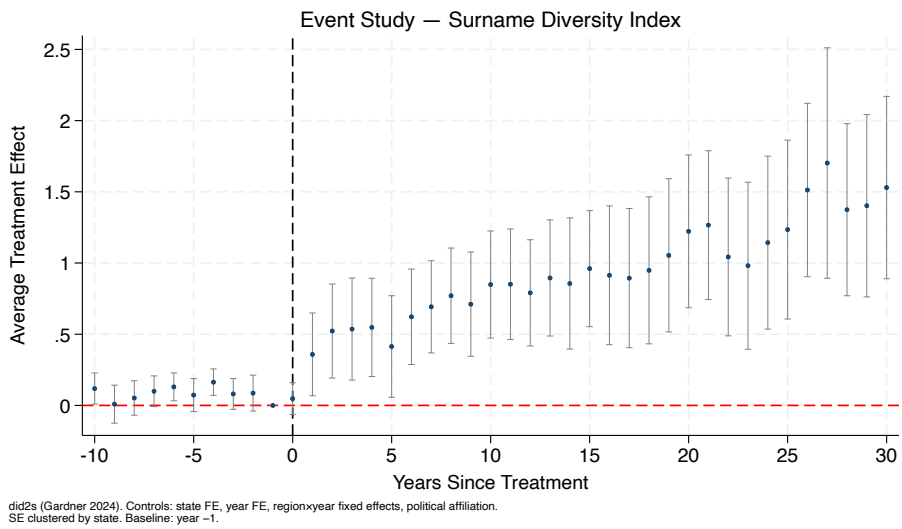



Figure 10: Event Study - Inventor Surnames Diversity

Gardner et al. (2024) event-study regression where the year a state passed the law prohibiting the issuance of special charters by the state is the treatment variable. The x-axis is the relative time to treatment and the y-axis is the increase in inventors' surnames diversity, measured by a Shannon (1948) Index. Additional controls to state and year fixed effects are regionyear fixed effects and per-state political affiliation.

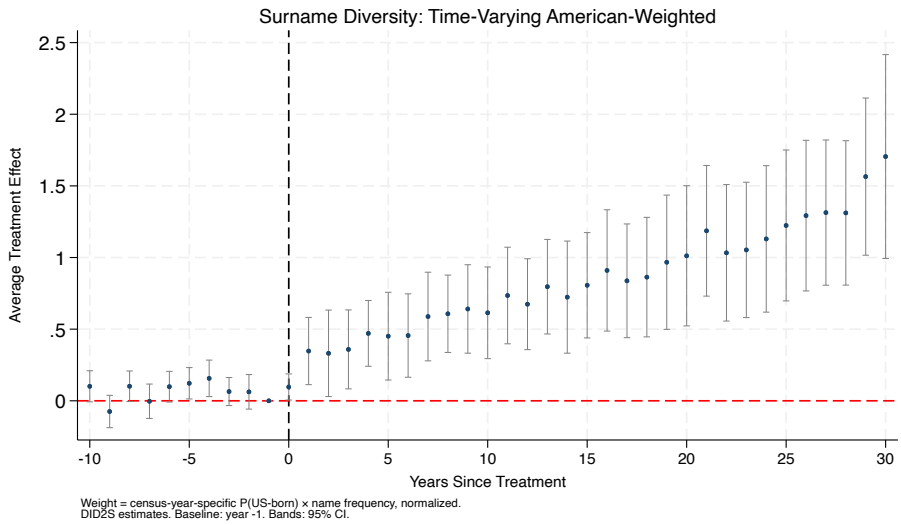



Figure 11: Event Study - Inventor Surnames Diversity (Only Americans)

Event-study estimates based on the two-stage difference-in-differences estimator of Gardner et al. (2024). Treatment is defined as the year in which a state adopted a law prohibiting the issuance of special corporate charters. The x-axis reports time relative to the treatment year, and the y-axis shows the estimated change in the Shannon surname diversity index for treated states. Each inventor–patent observation is weighted by the product of the census-year-specific probability that an individual with the inventor's first name was born in the United States and the number of census observations for that name in the relevant decade, using IPUMS decennial census microdata. Each patent is matched to the most recent census year preceding it. Weights are normalized to have a mean of one. All specifications include state and year fixed effects, region×year fixed effects, and controls for state political affiliation. The sample period is 1830–1920. Standard errors are clustered at the state level.

Table 5: Surname Diversity Regressions

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Treatment (SC law) | 1.31*** | 1.21*** | 1.20*** | 1.07*** | 1.25*** | 1.20*** | 1.10*** | 0.66*** | 1.51*** | 1.04*** | 0.64*** |
| | (0.24) | (0.30) | (0.24) | (0.26) | (0.22) | (0.23) | (0.23) | (0.20) | (0.26) | (0.18) | (0.15) |
| Outcome mean (all years) | 3.359 | 3.620 | 3.403 | 3.586 | 3.763 | 3.137 | 2.881 | 3.620 | 3.162 | 3.126 | 3.408 |
| Sample | All | States 1830 | ≥1840 | ≥1850 | ≥1860 | ≤1910 | ≤1900 | States 1830 | 3y bins | 5y bins | All |
| Method | did2s | did2s | did2s | did2s | did2s | did2s | did2s | did2s | did2s | did2s | OLS |
| Weight | non-weighted | non-weighted | non-weighted | non-weighted | non-weighted | non-weighted | non-weighted | population weighted | non-weighted | non-weighted | non-weighted |
| Observations | 2,858 | 1,741 | 2,807 | 2,605 | 2,356 | 2,448 | 2,044 | 1,741 | 1,059 | 668 | 2,858 |

Outcome: Shannon surname diversity index.
All columns include state FE, year FE, regionyear fixed effects, and political controls.
SE clustered by state. Sample: 1830–1920.
*States 1830*: states with positive population in 1830.

Table 6: Surname Diversity, Entire Population Regression

| | (1) |
|---|---|
| Treatment (SC law) | 0.08 |
| | (0.25) |
| Observations | 270 |
| States | 43 |

Outcome: Shannon surname diversity index (entire population, IPUMS census).
Controls: state FE, year FE, regionyear fixed effects, political affiliation.
SE clustered by state.

# 6. Case Study

## 6.1 An 1840s Debt Fiscal Crisis

One concern in our baseline analysis is that the timing of reforms prohibiting special charters may be endogenous to local economic conditions. To address this, we examine a setting in which institutional change was plausibly driven by an exogenous shock. We build on the historical analysis of Lamoreaux and Wallis (2020), who identify the fiscal crisis of the early 1840s as a key turning point in the evolution of corporate law across several U.S. states.

During this period, nine states[12] defaulted on their public debt following a boom in large-scale investments in transportation infrastructure. The crisis triggered a broad reassessment of state financial practices and the relationship between governments and corporations, including the process through which corporate charters were granted.

States responded heterogeneously to this shock. Five states—Indiana, Illinois, Louisiana, Maryland, and Michigan—revised their constitutions in its aftermath and addressed the issue of special charters and private legislation. However, only Indiana adopted a comprehensive reform that effectively eliminated special charters by requiring that all laws be "general and of uniform operation." The remaining states either adopted more limited restrictions or delayed substantial reform to later decades. In contrast, four states—Arkansas, Mississippi, Florida, and Pennsylvania—did not revise their constitutions in response to the crisis and did not introduce major contemporaneous changes to their incorporation regimes.[13]

Indiana's response to the fiscal crisis was particularly far-reaching. Its 1851 constitution required that laws enacted by the legislature "be general and of uniform operation throughout the state." As Lamoreaux and Wallis (2020) note, while such a provision may appear unremarkable from a modern perspective, it represented a significant institutional innovation in the mid-nineteenth century. By mandating general legislation, the reform effectively eliminated special charters and other forms of private or personal legislation,

12. Arkansas, Illinois, Indiana, Louisiana, Maryland, Michigan, Mississippi, Pennsylvania, and Florida (which had not yet formally achieved statehood).
13. Pennsylvania had adopted a new constitution in 1837, prior to the crisis.

marking a sharp departure from prior practice.

The prominence of this issue during Indiana's constitutional convention is illustrated by the following statement from the 1849 debates:

> *"If calling a convention to amend the constitution were productive of no other result than furnishing an effectual remedy for this growing evil (special charters), it would be abundantly justified." Governor Paris C. Dunning (1849)*

While the prohibition of special legislation was a central component of the 1851 constitution, it was part of a broader set of institutional changes, including restrictions on state borrowing, limits on legislative sessions, and reforms to public education and suffrage. Taken together, these changes reflect a broader effort to restructure state governance in response to the fiscal crisis.

This variation provides a useful setting for a case study. We exploit the contrast between Indiana's pioneering constitutional reform on special charters and the absence of reform in Arkansas, Mississippi, and Florida. Specifically, we treat Indiana as the exposed unit and use these states—none of which undertook constitutional reform in response to the crisis—as controls. Pennsylvania is excluded from the control group, as it had adopted a new constitution in 1837 that introduced a general incorporation law.

## 6.2 Case Study - First Stage

We begin by presenting first-stage evidence showing that Indiana ceased issuing special charters after the 1851 constitutional convention, while the control states—Arkansas, Mississippi, and Florida—continued to do so. Using the special charters dataset created by Wright (2015), we examine the annual number of special charters issued by each state during this period. As shown in Figure 12, the issuance of special charters in Indiana stopped immediately after the 1851 convention, with the exception of a single charter issued in 1855 to the Bank of the State of Indiana. In contrast, the issuance of special charters in the control states—Mississippi, Arkansas, and Florida—continued throughout the period.

The figure also reveals a temporary decline in charter issuance across all states in the early 1840s, coinciding with the peak of the debt crisis. This is unsurprising: the fiscal shock severely disrupted state finances and legislative activity during this period, naturally suppressing charter-granting activity in the short run. This temporary contraction is thus a direct reflection of the crisis itself rather than any pre-existing trend, and is consistent with the broader historical account of states scaling back their legislative output in the immediate aftermath of default. Indiana's subsequent and permanent drop to zero charters after 1851 is qualitatively distinct, reflecting the constitutional prohibition rather than a temporary fiscal constraint.

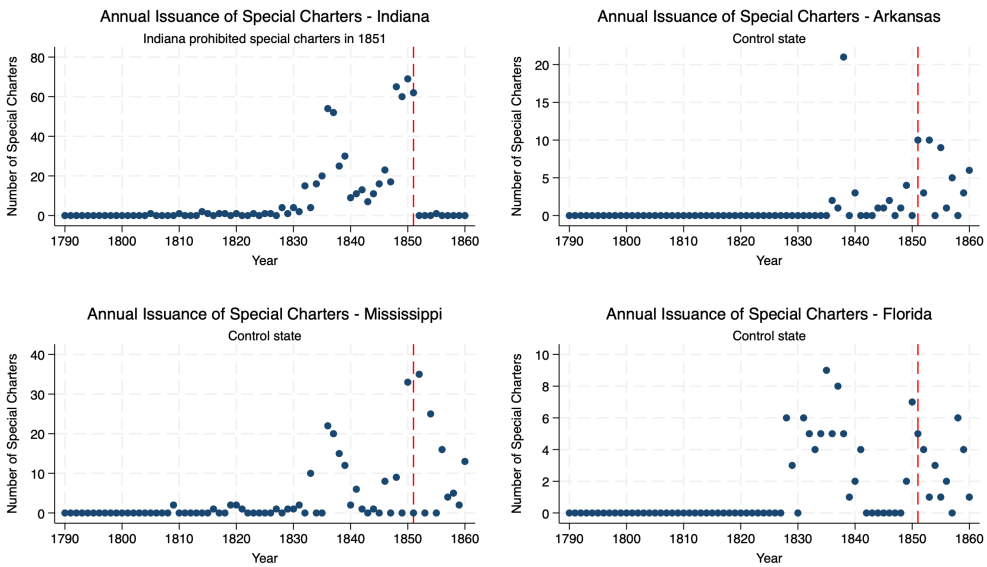



Figure 12: Annual Issuance of Special Charters (Flow) - Indiana (Treated), Arkansas (Control), Mississippi (Control) and Florida (Control)

## 6.3 Case Study - Regression Results

Exploiting this shock and the differential responses across states, we estimate a reduced-form specification in which Indiana is the only treated state (1851), while the control group consists of states that did not amend their constitutions in response to the crisis and thus retained their special charter regimes.[14] The sample begins in 1830 and ends in 1868, the year in which Arkansas—the first control state to do so—adopted its own prohibition on special charters, ensuring that the control group retains its untreated status throughout the estimation window.

As shown in Table 7, the estimated average treatment effect for Indiana is 7.5 patents per 100,000 population. This estimate is smaller than the baseline estimate, consistent with the shorter post-treatment period in this specification.

14. The states that did not amend their constitutions in response to the debt crisis are Mississippi, Arkansas, Florida, and Pennsylvania. Pennsylvania is excluded from the control group, as it had adopted a new constitution in 1837 that introduced a general incorporation law.

Table 7: Case Study: Indiana (1851) vs. non-reform states

| | (1) |
|---|---|
| Treatment (Indiana 1851) | 7.52*** |
| | (0.20) |
| Observations | 156 |
| States | 4 |

# 7. Conclusion

Special charters played a significant role in the institutional development of corporate organization in the United States during much of the nineteenth century. Although they served as a transitional step toward the modern system of general incorporation that remains in place today, their widespread use for nearly a century created important economic and social distortions. By granting access to the corporate form through individualized legislative acts, the special charter system effectively restricted business formation to a relatively narrow segment of the population.

The results in this paper suggest that unequal access to corporate formation under the special charter regime depressed innovative activity. When these restrictions were removed and general incorporation became available, innovation increased substantially. Importantly, the increase was not uniform across the population. Instead, much of the growth in patenting came from individuals outside the traditional elite, accompanied by a rise in the diversity of inventors. These findings indicate that broadening access to the corporate form expanded participation in entrepreneurial activity and technological innovation.

More broadly, the results contribute to our understanding of how institutional barriers shape the equilibrium level and composition of innovation. When access to economic opportunity is limited, competition and experimentation are muted, potentially suppressing technological progress. Conversely, policies that level the playing field and broaden access to economic institutions can stimulate both the quantity and quality of innovation. In this sense, the historical transition from special charters to general incorporation provides a clear illustration of how institutional reforms that expand economic participation can promote innovation and long-run economic development.

# Appendix

# A. Summary Statistics Tables

## A.1 Special Charters

| Decade | Special Charters (Mean*) | Special Charters (Std. Dev.) | Special Charters (Mean, Untreated Only) |
|---|---|---|---|
| 1790–1799 | 1 | 1.8 | 1 |
| 1800–1809 | 2 | 5.2 | 2 |
| 1810–1819 | 4 | 8.9 | 4 |
| 1820–1829 | 4 | 8.5 | 4 |
| 1830–1839 | 13 | 22.0 | 13 |
| 1840–1849 | 10 | 17.0 | 10 |
| 1850–1859 | 22 | 33.7 | 24 |
| 1860–1869 | 23 | 38.3 | 28 |

*Average number of special charters annual issuance, per state-year in that decade (zeros included).
*Special charters issuance data from Wright (2015), covering all charters between 1790-1860

Table 8: Decennial Summary: Special Charters

## A.2 Prohibition of Special Charters

| Decade | Adopted (in decade) | Cumulative # of States |
|---|---|---|
| 1830–1839 | 0 | 0 |
| 1840–1849 | 2 | 2 |
| 1850–1859 | 5 | 7 |
| 1860–1869 | 6 | 13 |
| 1870–1879 | 8 | 21 |
| 1880–1889 | 4 | 25 |
| 1890–1899 | 7 | 32 |
| 1900–1909 | 5 | 37 |
| 1910–1919 | 5 | 42 |
| 1920–1929 | 0 | 42 |

Table 9: Decennial Summary: Prohibition of Special Charters

## A.3 Patents

| Decade | Total Patents (Mean*) | Total Patents (Std. Dev.) | Patents per Capita (Mean*) | Patents per Capita (Std. Dev.) |
|---|---|---|---|---|
| 1830–1839 | 18 | 33.8 | 2.9 | 3.7 |
| 1840–1849 | 18 | 36.1 | 2.3 | 2.7 |
| 1850–1859 | 53 | 123.1 | 5.4 | 8.2 |
| 1860–1869 | 169 | 371.9 | 15.6 | 20.9 |
| 1870–1879 | 279 | 543.0 | 23.3 | 24.9 |
| 1880–1889 | 399 | 718.2 | 26.6 | 26.7 |
| 1890–1899 | 434 | 721.9 | 25.2 | 20.9 |
| 1900–1909 | 572 | 910.4 | 27.5 | 18.8 |
| 1910–1919 | 742 | 1,152.1 | 31.5 | 22.8 |
| 1920–1929 | 736 | 1,184.8 | 27.4 | 17.2 |

*Average number of patents in a given state for that decade (zeros included).

Table 10: Decennial Summary: Patents

## A.4 Political Affiliation

| Decade | Democratic Party (Mean*, %) | Democratic Party (Std. Dev., %) |
|---|---|---|
| 1830–1839 | 54.8 | 21.9 |
| 1840–1849 | 47.5 | 11.4 |
| 1850–1859 | 51.0 | 13.2 |
| 1860–1869 | 52.1 | 25.0 |
| 1870–1879 | 45.3 | 12.2 |
| 1880–1889 | 49.4 | 10.0 |
| 1890–1899 | 54.6 | 15.8 |
| 1900–1909 | 48.6 | 16.9 |
| 1910–1919 | 54.1 | 14.8 |
| 1920–1929 | 42.6 | 16.5 |

*Average Democratic vote share across state-years in each decade (percent; missing values excluded).

Table 11: Decennial Summary: Political Affiliation

## A.5 Surname Diversity

| Decade | Patents (Mean) | Unique Surnames (Rep. per Patent) (Mean) | Unique/Patents (Mean) | Shannon (Inventor) (Mean) |
|---|---|---|---|---|
| 1830–1839 | 13 | 12 | 0.96 | 1.57 |
| 1840–1849 | 15 | 14 | 0.96 | 1.64 |
| 1850–1859 | 50 | 42 | 0.92 | 2.56 |
| 1860–1869 | 132 | 103 | 0.90 | 3.09 |
| 1870–1879 | 218 | 171 | 0.89 | 3.92 |
| 1880–1889 | 332 | 242 | 0.86 | 4.31 |
| 1890–1899 | 360 | 252 | 0.83 | 4.52 |
| 1900–1909 | 525 | 344 | 0.80 | 4.91 |
| 1910–1919 | 659 | 431 | 0.79 | 5.25 |
| 1920–1929 | 639 | 387 | 0.76 | 5.14 |

Unique surnames computed using one representative surname per patent (ratio $\leq 1$).
Patents with multiple inventors are 8.9% of the sample (1830–1920).
Shannon index computed at the inventor level (surname distribution among inventors).

Table 12: Decennial Summary: Surnames

## A.6 Geographic Diversity

| Decade | Patents (Mean) | Unique Cities (Rep. per Patent) (Mean) | Unique/Patents (Mean) | Shannon (Inventor, City) (Mean) |
|---|---|---|---|---|
| 1830–1839 | 13 | 8 | 0.83 | 1.21 |
| 1840–1849 | 15 | 8 | 0.80 | 1.22 |
| 1850–1859 | 50 | 19 | 0.66 | 1.81 |
| 1860–1869 | 132 | 40 | 0.60 | 2.07 |
| 1870–1879 | 218 | 58 | 0.51 | 2.53 |
| 1880–1889 | 333 | 74 | 0.47 | 2.75 |
| 1890–1899 | 361 | 77 | 0.43 | 2.86 |
| 1900–1909 | 525 | 106 | 0.40 | 3.15 |
| 1910–1919 | 660 | 137 | 0.39 | 3.38 |
| 1920–1929 | 644 | 118 | 0.36 | 3.19 |

Unique cities computed using one representative inventor per patent (ratio $\leq 1$).
Patents with multiple inventors are 8.9% of the sample (1830–1920).
Shannon index computed at the inventor level (city distribution among inventors).

Table 13: Decennial Summary: Geographies

Figure A1: Annual Special-Charter Counts by State — Around First General-Incorporation Law

Annual count of special charters issued by each state (bars). Dashed red vertical line marks the year the state adopted its first general-incorporation law. Only states with both pre- and post-treatment observations in the 1830–1860 sample window are shown. Each state's panel is censored at its own prohibition year (if any), so the post-treatment window reflects the period in which general incorporation operated but special charters remained legal. States whose first law coincided with or post-dated the prohibition are excluded.

Figure A2: Annual Special-Charter Counts by State — Around Prohibition of Special Charters

Annual count of special charters issued by each state (bars). Dashed red vertical line marks the year the state prohibited the issuance of special charters. Only states with both pre- and post-prohibition observations in the 1830–1860 sample window are shown. The seven states that never formally prohibited special charters are excluded, following the main analysis, because they have no well-defined treatment year.

# B. Permutation Exercises

## B.1 Permutations - Patents

| Event Time | Mean | SD | Min | Max | Real Coef | Real Coef SD | p-value |
|---|---|---|---|---|---|---|---|
| 3 Decades Before | 0.04 | 0.90 | -2.87 | 2.92 | -0.81 | 0.46 | 0.823 |
| 2 Decades Before | -0.00 | 0.86 | -2.58 | 3.02 | -0.21 | 0.50 | 0.594 |
| Treatment Year | 0.04 | 0.92 | -2.76 | 2.68 | -0.24 | 0.65 | 0.617 |
| 1 Decade After | 0.88 | 2.93 | -11.57 | 12.43 | 5.78 | 2.10 | 0.052 |
| 2 Decades After | 1.01 | 4.37 | -13.96 | 15.99 | 9.08 | 2.44 | 0.028 |
| 3 Decades After | 2.07 | 5.89 | -16.99 | 30.62 | 13.03 | 3.27 | 0.023 |

*Notes:* The table reports the distribution of placebo coefficients from 1,000 permutations of treatment timing across states. The p-value is the share of placebo coefficients larger than the real treatment coefficient.

Table 14: Permutation Exercise - Patents Per Capita

## B.2 Permutations - Patent Citations

| Event Time | Mean | SD | Min | Max | Real Coef | Real Coef SD | p-value |
|---|---|---|---|---|---|---|---|
| 3 Decades Before | 2.69 | 11.34 | -34.67 | 44.68 | -4.90 | 3.24 | 0.751 |
| 2 Decades Before | 1.31 | 9.53 | -24.11 | 36.76 | -5.14 | 2.54 | 0.750 |
| Treatment Year | -3.53 | 21.79 | -90.64 | 53.76 | 6.80 | 4.61 | 0.342 |
| 1 Decade After | 11.50 | 95.38 | -428.52 | 327.04 | 56.13 | 24.60 | 0.364 |
| 2 Decades After | 15.53 | 172.04 | -791.12 | 599.75 | 93.30 | 34.60 | 0.367 |
| 3 Decades After | 38.73 | 219.18 | -937.84 | 565.67 | 237.06 | 73.07 | 0.134 |

*Notes:* The table reports the distribution of placebo coefficients from 1,000 permutations of treatment timing across states. The outcome is total patent future citations. The p-value is the share of placebo coefficients larger than the real treatment coefficient. Future citations are built from patent-level forward citations and then aggregated to the state-year level.

Table 15: Permutation Exercise - Total Patent Citations

## B.3 Permutations - Patent Breakthroughs

| Event Time | Mean | SD | Min | Max | Real Coef | Real Coef SD | p-value |
|---|---|---|---|---|---|---|---|
| 3 Decades Before | 0.02 | 0.95 | -3.05 | 3.04 | -0.65 | 0.29 | 0.748 |
| 2 Decades Before | 0.03 | 0.53 | -2.17 | 1.70 | 0.18 | 0.24 | 0.362 |
| Treatment Year | -0.10 | 0.72 | -2.83 | 2.49 | -0.21 | 0.35 | 0.594 |
| 1 Decade After | 0.27 | 3.37 | -14.99 | 10.38 | 3.08 | 1.84 | 0.180 |
| 2 Decades After | 0.34 | 6.09 | -26.33 | 19.54 | 2.88 | 1.48 | 0.377 |
| 3 Decades After | 0.91 | 8.05 | -36.36 | 18.48 | 8.06 | 2.60 | 0.113 |

*Notes:* The table reports the distribution of placebo coefficients from 1,000 permutations of treatment timing across states. The outcome is total breakthrough patents. Breakthroughs are defined by Kelly et al. (2020), using the `bk_p90_alqsim010` measure. The p-value is the share of placebo coefficients larger than the real treatment coefficient.

Table 16: Permutation Exercise - Total Patent Breakthroughs

## B.4 Permutations - Political Connectedness

## B.5 Quality of Patents - Breakthroughs by SES Decile

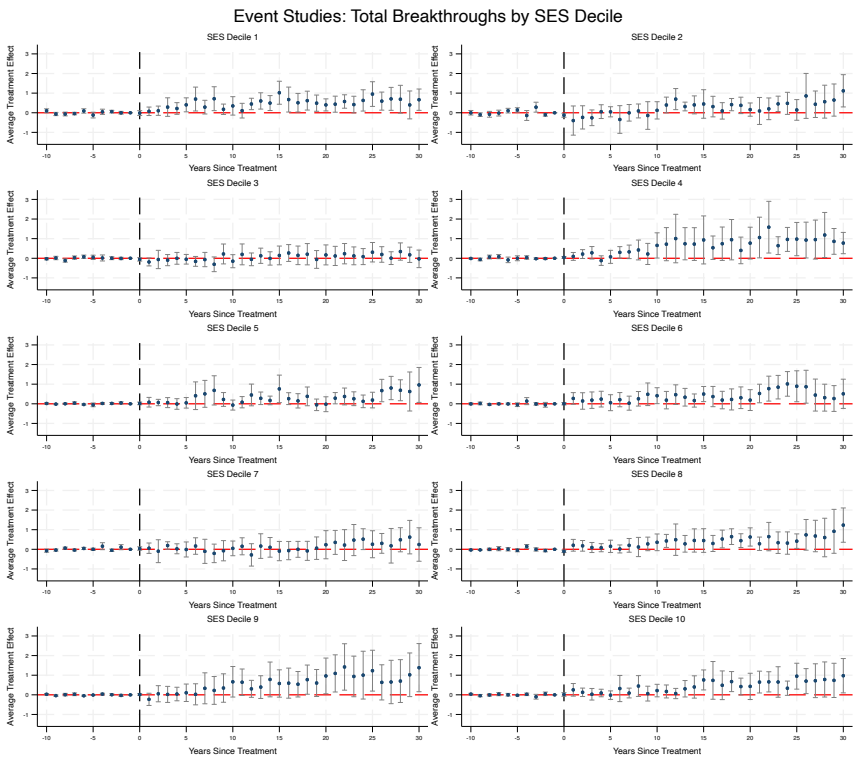



Figure A3: Event Study - Total Breakthroughs, By SES Decile

Gardner et al. (2024) event-study regression where the year a state passed the law prohibiting the issuance of special charters by the state is the treatment variable. The x-axis is the relative time to treatment and the y-axis is the increase in total patent breakthroughs, as defined by Kelly et al. (2020), for the treated. Additional controls to state and year fixed effects are regionyear fixed effects and per-state political affiliation. SES deciles are created using inventor first-name-to-SES-score based on Olivetti and Paserman (2015).

Table 17: Quality of Patents, Measured By Breakthroughs - By SES Decile - Regressions Table

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) |
|---|---|---|---|---|---|---|---|---|---|---|
| Treatment (SC law) | 0.764*** | -0.042 | 0.307 | 0.784*** | 0.610*** | 1.125*** | 0.613*** | 0.648*** | 0.860*** | 0.767*** |
| | (0.191) | (0.405) | (0.245) | (0.252) | (0.201) | (0.293) | (0.170) | (0.197) | (0.288) | (0.240) |
| Outcome mean (all) | 0.629 | 0.603 | 0.530 | 0.538 | 0.439 | 0.726 | 0.443 | 0.466 | 0.620 | 0.522 |
| Sample | All | All | All | All | All | All | All | All | All | All |
| Method | did2s | did2s | did2s | did2s | did2s | did2s | did2s | did2s | did2s | did2s |
| Weight | non-weighted | non-weighted | non-weighted | non-weighted | non-weighted | non-weighted | non-weighted | non-weighted | non-weighted | non-weighted |
| Observations | 2,861 | 2,861 | 2,861 | 2,861 | 2,861 | 2,861 | 2,861 | 2,861 | 2,861 | 2,861 |

Outcome: total breakthrough patents, by SES decile (1–10).
Breakthroughs: Kelly et al. (2020), 10-year windows.
SES ranks: first-name mapping (Olivetti & Paserman 2013).
State FE, Year FE, RegionYear Fixed Effects, political control included.
SE clustered by state. Sample: 1830–1920.

# C. State Passing Law Years Table

Table 18: States and Law Passing Years

| State | General Incorporation | Prohibition of Special Charters |
|---|---|---|
| Iowa | 1847 | 1846 |
| California | 1850 | 1849 |
| Michigan | 1846 | 1850 |
| Indiana | 1852 | 1851 |
| Ohio | 1846 | 1851 |
| Minnesota | 1858 | 1858 |
| Oregon | 1862 | 1859 |
| Kansas | 1859 | 1861 |
| West Virginia | 1863 | 1863 |
| Nevada | 1865 | 1864 |
| Missouri | 1864 | 1865 |
| Nebraska | 1864 | 1866 |
| Arkansas | 1869 | 1868 |
| Illinois | 1852 | 1870 |
| Tennessee | 1850 | 1870 |
| Wisconsin | 1849 | 1871 |
| Pennsylvania | 1836 | 1874 |
| New Jersey | 1846 | 1875 |
| Colorado | 1867 | 1876 |
| Texas | 1874 | 1876 |
| Louisiana | 1848 | 1879 |
| Montana | 1872 | 1889 |
| North Dakota | 1877 | 1889 |
| South Dakota | 1877 | 1889 |
| Washington | 1866 | 1889 |
| Idaho | 1875 | 1890 |
| Mississippi | 1857 | 1890 |
| Wyoming | 1869 | 1890 |
| Kentucky | 1854 | 1891 |
| Georgia | 1876 | 1892 |
| Utah | 1870 | 1896 |
| Delaware | 1871 | 1897 |
| Florida | 1852 | 1900 |
| Hawaii | 1890 | 1900 |
| Alabama | 1852 | 1901 |
| Virginia | 1854 | 1902 |
| Oklahoma | 1890 | 1907 |
| Arizona | 1866 | 1910 |
| Alaska | 1903 | 1912 |
| New Mexico | 1867 | 1912 |
| Vermont | 1851 | 1913 |
| North Carolina | 1852 | 1916 |
| South Carolina | 1869 | 1970 |
| Connecticut | 1837 | Never Passed |
| Maine | 1862 | Never Passed |
| Maryland | 1852 | Never Passed |
| Massachusetts | 1851 | Never Passed |
| New Hampshire | 1866 | Never Passed |
| New York | 1811 | Never Passed |
| Rhode Island | 1893 | Never Passed |

# D. Total Patents by State and Year Full Table

Table 20: State–Year Total Patents: 1830–1839

| | year | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1830 | 1831 | 1832 | 1833 | 1834 | 1835 | 1836 | 1837 | 1838 | 1839 |
| state | | | | | | | | | | |
| Alabama | 1 | 0 | 2 | 1 | 3 | 3 | 3 | 2 | 3 | 0 |
| Arkansas | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Connecticut | 52 | 23 | 29 | 45 | 43 | 45 | 44 | 27 | 39 | 30 |
| Delaware | 3 | 2 | 0 | 3 | 2 | 1 | 1 | 0 | 3 | 1 |
| Florida | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Georgia | 3 | 2 | 4 | 5 | 2 | 3 | 3 | 0 | 3 | 1 |
| Illinois | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 2 | 1 |
| Indiana | 6 | 5 | 4 | 5 | 8 | 2 | 2 | 1 | 1 | 4 |
| Kentucky | 0 | 10 | 7 | 7 | 13 | 10 | 9 | 6 | 10 | 4 |
| Louisiana | 2 | 6 | 1 | 2 | 0 | 2 | 2 | 3 | 3 | 1 |
| Maine | 15 | 16 | 24 | 23 | 43 | 50 | 51 | 20 | 20 | 2 |
| Maryland | 24 | 30 | 12 | 19 | 34 | 30 | 30 | 23 | 28 | 18 |
| Massachusetts | 46 | 68 | 56 | 74 | 91 | 78 | 70 | 67 | 84 | 77 |
| Michigan | 1 | 1 | 2 | 0 | 1 | 4 | 4 | 0 | 2 | 1 |
| Mississippi | 1 | 2 | 3 | 6 | 3 | 3 | 3 | 1 | 0 | 0 |
| Missouri | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 2 |
| New Hampshire | 14 | 23 | 11 | 21 | 13 | 37 | 34 | 13 | 15 | 8 |
| New Jersey | 8 | 21 | 8 | 11 | 10 | 11 | 12 | 16 | 13 | 18 |
| New York | 190 | 193 | 122 | 177 | 163 | 174 | 179 | 127 | 149 | 120 |
| North Carolina | 6 | 10 | 5 | 7 | 7 | 3 | 3 | 1 | 3 | 1 |
| Ohio | 19 | 38 | 54 | 33 | 25 | 26 | 27 | 14 | 20 | 25 |
| Pennsylvania | 88 | 70 | 82 | 86 | 88 | 63 | 62 | 58 | 52 | 60 |
| Rhode Island | 14 | 1 | 4 | 8 | 15 | 2 | 2 | 8 | 6 | 4 |
| South Carolina | 6 | 1 | 4 | 5 | 4 | 3 | 3 | 2 | 6 | 1 |
| Tennessee | 3 | 6 | 7 | 10 | 8 | 9 | 0 | 1 | 5 | 4 |
| Vermont | 5 | 9 | 14 | 11 | 18 | 24 | 20 | 20 | 16 | 9 |
| Virginia | 26 | 25 | 11 | 25 | 99 | 16 | 20 | 13 | 9 | 21 |
| West Virginia | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Wisconsin | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |

Table 21: State–Year Total Patents: 1840–1849

| | year | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1840 | 1841 | 1842 | 1843 | 1844 | 1845 | 1846 | 1847 | 1848 | 1849 |
| state | | | | | | | | | | |
| Alabama | 3 | 2 | 10 | 6 | 2 | 5 | 8 | 6 | 3 | 7 |
| Arkansas | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| Connecticut | 24 | 20 | 21 | 35 | 29 | 33 | 28 | 30 | 40 | 53 |
| Delaware | 2 | 2 | 3 | 1 | 2 | 4 | 2 | 2 | 3 | 3 |
| Florida | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| Georgia | 2 | 3 | 4 | 2 | 1 | 1 | 7 | 5 | 2 | 5 |
| Illinois | 1 | 9 | 8 | 7 | 7 | 6 | 9 | 5 | 11 | 19 |
| Indiana | 0 | 7 | 5 | 2 | 2 | 3 | 10 | 4 | 2 | 14 |
| Iowa | 0 | 3 | 0 | 3 | 7 | 0 | 2 | 2 | 1 | 2 |
| Kentucky | 6 | 4 | 1 | 7 | 4 | 4 | 5 | 5 | 6 | 9 |
| Louisiana | 1 | 8 | 1 | 5 | 4 | 7 | 5 | 11 | 5 | 6 |
| Maine | 10 | 6 | 8 | 4 | 11 | 5 | 7 | 7 | 6 | 20 |
| Maryland | 25 | 25 | 23 | 24 | 17 | 14 | 18 | 15 | 19 | 27 |
| Massachusetts | 77 | 86 | 66 | 74 | 62 | 54 | 55 | 66 | 95 | 85 |
| Michigan | 3 | 2 | 1 | 3 | 4 | 7 | 6 | 4 | 10 | 9 |
| Mississippi | 0 | 3 | 3 | 1 | 2 | 0 | 1 | 0 | 1 | 2 |
| Missouri | 3 | 2 | 5 | 3 | 4 | 5 | 5 | 3 | 3 | 9 |
| New Hampshire | 10 | 4 | 7 | 7 | 5 | 4 | 6 | 2 | 10 | 28 |
| New Jersey | 6 | 21 | 26 | 13 | 20 | 20 | 9 | 19 | 14 | 40 |
| New York | 129 | 147 | 159 | 161 | 143 | 179 | 200 | 180 | 206 | 255 |
| North Carolina | 2 | 1 | 3 | 0 | 5 | 0 | 5 | 4 | 10 | 3 |
| Ohio | 31 | 28 | 44 | 48 | 41 | 38 | 29 | 39 | 51 | 84 |
| Pennsylvania | 78 | 62 | 64 | 70 | 74 | 52 | 90 | 79 | 102 | 105 |
| Rhode Island | 8 | 7 | 4 | 5 | 3 | 4 | 3 | 4 | 10 | 15 |
| South Carolina | 3 | 2 | 2 | 3 | 3 | 4 | 1 | 5 | 2 | 3 |
| Tennessee | 4 | 4 | 4 | 1 | 4 | 4 | 0 | 6 | 4 | 4 |
| Vermont | 11 | 11 | 8 | 14 | 6 | 11 | 15 | 7 | 8 | 23 |
| Virginia | 7 | 11 | 5 | 9 | 8 | 12 | 12 | 9 | 7 | 11 |
| West Virginia | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Wisconsin | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |

Table 22: State–Year Total Patents: 1850–1859

| | year | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1850 | 1851 | 1852 | 1853 | 1854 | 1855 | 1856 | 1857 | 1858 | 1859 |
| state | | | | | | | | | | |
| Alabama | 2 | 2 | 2 | 1 | 5 | 12 | 11 | 26 | 24 | 23 |
| Arkansas | 1 | 0 | 1 | 0 | 1 | 1 | 1 | 3 | 3 | 5 |
| California | 0 | 0 | 0 | 1 | 4 | 5 | 11 | 7 | 20 | 46 |
| Connecticut | 57 | 54 | 53 | 45 | 106 | 111 | 143 | 141 | 198 | 231 |
| Delaware | 4 | 2 | 2 | 0 | 7 | 9 | 10 | 11 | 9 | 10 |
| Florida | 1 | 0 | 0 | 0 | 2 | 4 | 1 | 0 | 4 | 5 |
| Georgia | 5 | 8 | 8 | 5 | 8 | 7 | 14 | 14 | 20 | 60 |
| Illinois | 16 | 12 | 23 | 24 | 38 | 60 | 82 | 177 | 147 | 190 |
| Indiana | 21 | 10 | 12 | 18 | 36 | 38 | 50 | 55 | 80 | 142 |
| Iowa | 1 | 5 | 6 | 2 | 4 | 9 | 8 | 14 | 42 | 29 |
| Kentucky | 8 | 9 | 7 | 8 | 23 | 23 | 20 | 35 | 29 | 37 |
| Louisiana | 6 | 4 | 2 | 6 | 5 | 17 | 24 | 19 | 32 | 48 |
| Maine | 12 | 10 | 13 | 23 | 30 | 23 | 28 | 27 | 48 | 52 |
| Maryland | 25 | 10 | 19 | 14 | 35 | 32 | 43 | 51 | 77 | 102 |
| Massachusetts | 141 | 139 | 148 | 146 | 335 | 316 | 347 | 385 | 399 | 452 |
| Michigan | 3 | 5 | 6 | 11 | 16 | 29 | 24 | 33 | 51 | 60 |
| Minnesota | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 3 | 2 | 5 |
| Mississippi | 2 | 1 | 3 | 1 | 5 | 9 | 10 | 12 | 31 | 24 |
| Missouri | 5 | 9 | 4 | 3 | 10 | 7 | 34 | 44 | 47 | 52 |
| New Hampshire | 22 | 19 | 16 | 16 | 41 | 44 | 51 | 38 | 49 | 61 |
| New Jersey | 24 | 17 | 20 | 19 | 78 | 82 | 77 | 85 | 125 | 114 |
| New Mexico | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| New York | 300 | 299 | 350 | 290 | 507 | 582 | 626 | 765 | 959 | 1,113 |
| North Carolina | 3 | 2 | 1 | 4 | 7 | 4 | 7 | 16 | 20 | 24 |
| Ohio | 90 | 87 | 81 | 68 | 144 | 136 | 146 | 218 | 292 | 334 |
| Oregon | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pennsylvania | 152 | 90 | 157 | 154 | 261 | 245 | 275 | 272 | 412 | 481 |
| Rhode Island | 14 | 14 | 14 | 14 | 20 | 26 | 25 | 33 | 43 | 69 |
| South Carolina | 4 | 4 | 3 | 2 | 4 | 7 | 9 | 11 | 12 | 14 |
| Tennessee | 7 | 4 | 6 | 3 | 9 | 8 | 14 | 14 | 18 | 30 |
| Texas | 2 | 2 | 0 | 1 | 2 | 4 | 5 | 6 | 11 | 28 |
| Utah | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Vermont | 12 | 11 | 19 | 16 | 27 | 34 | 39 | 49 | 40 | 62 |
| Virginia | 19 | 9 | 14 | 24 | 43 | 48 | 49 | 53 | 57 | 63 |
| Washington | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 |
| West Virginia | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Wisconsin | 3 | 3 | 2 | 1 | 8 | 16 | 30 | 32 | 52 | 68 |

Table 23: State–Year Total Patents: 1860–1869

| | year | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1860 | 1861 | 1862 | 1863 | 1864 | 1865 | 1866 | 1867 | 1868 | 1869 |
| state | | | | | | | | | | |
| Alabama | 24 | 6 | 0 | 0 | 0 | 2 | 3 | 25 | 28 | 46 |
| Arkansas | 6 | 0 | 0 | 0 | 0 | 2 | 1 | 5 | 1 | 12 |
| California | 54 | 43 | 31 | 62 | 58 | 70 | 110 | 174 | 211 | 287 |
| Colorado | 0 | 0 | 1 | 4 | 7 | 15 | 8 | 5 | 4 | 15 |
| Connecticut | 237 | 157 | 186 | 190 | 247 | 406 | 527 | 645 | 624 | 653 |
| Delaware | 5 | 6 | 5 | 7 | 8 | 17 | 21 | 25 | 37 | 30 |
| Florida | 13 | 1 | 1 | 0 | 0 | 1 | 4 | 11 | 2 | 6 |
| Georgia | 73 | 15 | 0 | 0 | 0 | 0 | 15 | 59 | 46 | 66 |
| Illinois | 226 | 166 | 178 | 250 | 319 | 435 | 650 | 853 | 964 | 1,008 |
| Indiana | 111 | 59 | 64 | 76 | 102 | 150 | 245 | 475 | 448 | 461 |
| Iowa | 52 | 52 | 67 | 87 | 96 | 109 | 200 | 260 | 257 | 223 |
| Kansas | 1 | 3 | 0 | 6 | 7 | 8 | 17 | 21 | 17 | 34 |
| Kentucky | 39 | 33 | 14 | 30 | 35 | 36 | 94 | 90 | 90 | 84 |
| Louisiana | 57 | 4 | 2 | 5 | 6 | 10 | 27 | 80 | 94 | 89 |
| Maine | 73 | 49 | 47 | 40 | 45 | 109 | 163 | 185 | 207 | 180 |
| Maryland | 64 | 65 | 29 | 37 | 63 | 87 | 154 | 175 | 175 | 212 |
| Massachusetts | 472 | 361 | 420 | 444 | 602 | 959 | 1,077 | 1,320 | 1,393 | 1,322 |
| Michigan | 75 | 74 | 89 | 102 | 127 | 147 | 226 | 370 | 466 | 431 |
| Minnesota | 7 | 5 | 9 | 12 | 16 | 12 | 33 | 60 | 79 | 80 |
| Mississippi | 42 | 6 | 0 | 0 | 0 | 2 | 3 | 20 | 20 | 56 |
| Missouri | 75 | 38 | 26 | 43 | 47 | 61 | 105 | 200 | 211 | 246 |
| Nebraska | 2 | 0 | 2 | 2 | 8 | 5 | 5 | 2 | 6 | 14 |
| Nevada | 0 | 0 | 1 | 1 | 5 | 6 | 9 | 9 | 14 | 2 |
| New Hampshire | 58 | 41 | 40 | 38 | 50 | 54 | 99 | 249 | 136 | 111 |
| New Jersey | 135 | 120 | 124 | 131 | 166 | 211 | 305 | 388 | 420 | 423 |
| New Mexico | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| New York | 1,278 | 894 | 969 | 1,135 | 1,345 | 1,885 | 1,856 | 2,833 | 2,771 | 2,940 |
| North Carolina | 26 | 7 | 0 | 0 | 0 | 1 | 6 | 25 | 26 | 43 |
| Ohio | 340 | 210 | 249 | 260 | 311 | 484 | 926 | 1,128 | 1,029 | 1,005 |
| Oregon | 0 | 2 | 0 | 1 | 0 | 3 | 7 | 17 | 23 | 40 |
| Pennsylvania | 513 | 332 | 363 | 425 | 452 | 771 | 926 | 1,295 | 1,340 | 1,349 |
| Rhode Island | 77 | 65 | 60 | 52 | 82 | 94 | 121 | 156 | 188 | 197 |
| South Carolina | 26 | 2 | 0 | 0 | 0 | 1 | 6 | 14 | 14 | 22 |
| Tennessee | 46 | 10 | 1 | 5 | 4 | 7 | 31 | 50 | 66 | 69 |
| Texas | 21 | 8 | 0 | 0 | 0 | 2 | 6 | 15 | 17 | 49 |
| Utah | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 2 |
| Vermont | 67 | 35 | 45 | 45 | 44 | 48 | 84 | 36 | 156 | 134 |
| Virginia | 101 | 13 | 9 | 13 | 10 | 11 | 64 | 78 | 88 | 96 |
| Washington | 0 | 0 | 3 | 0 | 0 | 1 | 2 | 2 | 0 | 4 |
| West Virginia | 0 | 0 | 0 | 0 | 6 | 11 | 12 | 18 | 30 | 35 |
| Wisconsin | 62 | 54 | 71 | 88 | 94 | 149 | 233 | 274 | 301 | 263 |

Table 24: State–Year Total Patents: 1870–1879

| | year | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1870 | 1871 | 1872 | 1873 | 1874 | 1875 | 1876 | 1877 | 1878 | 1879 |
| state | | | | | | | | | | |
| Alabama | 36 | 29 | 45 | 43 | 39 | 31 | 46 | 43 | 39 | 61 |
| Arizona | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 2 | 2 | 0 |
| Arkansas | 11 | 13 | 13 | 11 | 14 | 11 | 23 | 36 | 45 | 28 |
| California | 216 | 243 | 265 | 251 | 301 | 399 | 423 | 341 | 320 | 351 |
| Colorado | 18 | 13 | 12 | 8 | 22 | 36 | 21 | 28 | 35 | 29 |
| Connecticut | 739 | 667 | 648 | 622 | 668 | 706 | 736 | 607 | 529 | 569 |
| Delaware | 39 | 46 | 42 | 40 | 39 | 44 | 35 | 28 | 39 | 24 |
| Florida | 5 | 10 | 8 | 8 | 12 | 7 | 22 | 14 | 3 | 9 |
| Georgia | 81 | 73 | 59 | 53 | 69 | 63 | 63 | 63 | 105 | 74 |
| Idaho | 0 | 2 | 1 | 1 | 0 | 1 | 5 | 1 | 2 | 3 |
| Illinois | 835 | 871 | 863 | 844 | 944 | 1,098 | 1,298 | 1,046 | 998 | 949 |
| Indiana | 452 | 393 | 385 | 311 | 355 | 378 | 425 | 450 | 345 | 359 |
| Iowa | 208 | 225 | 235 | 246 | 312 | 315 | 425 | 488 | 325 | 309 |
| Kansas | 46 | 40 | 73 | 75 | 74 | 66 | 83 | 103 | 63 | 81 |
| Kentucky | 123 | 143 | 125 | 145 | 125 | 142 | 163 | 151 | 145 | 156 |
| Louisiana | 111 | 95 | 76 | 96 | 76 | 103 | 107 | 79 | 76 | 59 |
| Maine | 139 | 197 | 170 | 139 | 151 | 158 | 178 | 132 | 140 | 112 |
| Maryland | 206 | 240 | 242 | 191 | 218 | 260 | 273 | 192 | 183 | 220 |
| Massachusetts | 1,448 | 1,386 | 1,435 | 1,379 | 1,506 | 1,846 | 1,587 | 1,392 | 1,199 | 1,134 |
| Michigan | 401 | 383 | 337 | 356 | 380 | 405 | 426 | 383 | 390 | 391 |
| Minnesota | 70 | 53 | 78 | 110 | 110 | 146 | 164 | 146 | 129 | 101 |
| Mississippi | 50 | 48 | 75 | 55 | 56 | 38 | 42 | 39 | 38 | 45 |
| Missouri | 210 | 248 | 251 | 288 | 306 | 362 | 423 | 365 | 315 | 281 |
| Montana | 1 | 2 | 0 | 3 | 1 | 4 | 3 | 3 | 3 | 4 |
| Nebraska | 16 | 12 | 22 | 28 | 29 | 22 | 40 | 3 | 50 | 48 |
| Nevada | 9 | 21 | 22 | 19 | 16 | 16 | 21 | 24 | 36 | 29 |
| New Hampshire | 111 | 102 | 122 | 127 | 127 | 127 | 106 | 78 | 92 | 95 |
| New Jersey | 474 | 496 | 682 | 614 | 616 | 656 | 685 | 502 | 490 | 587 |
| New Mexico | 2 | 1 | 2 | 1 | 0 | 3 | 1 | 3 | 3 | 2 |
| New York | 2,962 | 2,954 | 3,079 | 2,826 | 2,785 | 3,771 | 3,914 | 2,496 | 2,599 | 2,556 |
| North Carolina | 54 | 51 | 36 | 58 | 47 | 37 | 51 | 51 | 53 | 55 |
| North Dakota | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ohio | 982 | 905 | 985 | 832 | 928 | 1,091 | 1,195 | 1,083 | 1,070 | 902 |
| Oregon | 22 | 23 | 23 | 19 | 30 | 22 | 24 | 38 | 35 | 19 |
| Pennsylvania | 1,481 | 1,543 | 1,575 | 1,639 | 1,644 | 2,034 | 1,895 | 1,518 | 1,296 | 1,369 |
| Rhode Island | 197 | 184 | 179 | 167 | 164 | 229 | 231 | 212 | 190 | 191 |
| South Carolina | 35 | 26 | 29 | 25 | 42 | 46 | 31 | 34 | 28 | 36 |
| South Dakota | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Tennessee | 109 | 104 | 105 | 105 | 89 | 117 | 107 | 114 | 98 | 91 |
| Texas | 48 | 52 | 73 | 109 | 113 | 118 | 108 | 115 | 130 | 142 |
| Utah | 1 | 0 | 3 | 8 | 9 | 5 | 14 | 4 | 7 | 7 |
| Vermont | 123 | 111 | 91 | 87 | 126 | 122 | 111 | 58 | 109 | 70 |
| Virginia | 110 | 108 | 106 | 76 | 71 | 101 | 145 | 100 | 113 | 107 |
| Washington | 1 | 1 | 3 | 6 | 4 | 3 | 5 | 4 | 13 | 7 |
| West Virginia | 47 | 42 | 57 | 42 | 38 | 48 | 55 | 31 | 58 | 49 |
| Wisconsin | 228 | 227 | 201 | 217 | 255 | 284 | 303 | 245 | 251 | 215 |
| Wyoming | 1 | 3 | 1 | 2 | 4 | 2 | 10 | 9 | 8 | 5 |

Table 25: State–Year Total Patents: 1880–1889

| | year | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1880 | 1881 | 1882 | 1883 | 1884 | 1885 | 1886 | 1887 | 1888 | 1889 |
| state | | | | | | | | | | |
| Alabama | 62 | 47 | 46 | 77 | 69 | 85 | 59 | 54 | 64 | 76 |
| Arizona | 2 | 4 | 7 | 14 | 9 | 8 | 13 | 3 | 10 | 14 |
| Arkansas | 44 | 48 | 53 | 59 | 66 | 77 | 61 | 65 | 69 | 84 |
| California | 349 | 440 | 486 | 596 | 514 | 588 | 524 | 505 | 445 | 566 |
| Colorado | 24 | 73 | 90 | 119 | 110 | 140 | 111 | 151 | 153 | 142 |
| Connecticut | 610 | 693 | 794 | 883 | 896 | 1,011 | 854 | 788 | 759 | 889 |
| Delaware | 23 | 31 | 34 | 36 | 48 | 31 | 42 | 34 | 33 | 54 |
| Florida | 15 | 21 | 18 | 24 | 17 | 25 | 41 | 41 | 39 | 54 |
| Georgia | 77 | 93 | 24 | 115 | 106 | 144 | 140 | 130 | 122 | 150 |
| Idaho | 2 | 3 | 4 | 6 | 4 | 6 | 6 | 4 | 12 | 18 |
| Illinois | 943 | 1,122 | 1,422 | 1,792 | 1,659 | 1,907 | 1,798 | 1,595 | 1,661 | 1,940 |
| Indiana | 359 | 448 | 613 | 712 | 624 | 777 | 699 | 556 | 494 | 572 |
| Iowa | 285 | 300 | 348 | 445 | 418 | 457 | 452 | 438 | 368 | 430 |
| Kansas | 96 | 119 | 173 | 189 | 198 | 230 | 283 | 311 | 330 | 361 |
| Kentucky | 170 | 170 | 196 | 228 | 194 | 228 | 251 | 245 | 218 | 248 |
| Louisiana | 66 | 74 | 86 | 81 | 89 | 76 | 95 | 112 | 98 | 133 |
| Maine | 101 | 133 | 157 | 183 | 148 | 156 | 138 | 151 | 152 | 147 |
| Maryland | 229 | 265 | 272 | 260 | 254 | 284 | 270 | 253 | 283 | 321 |
| Massachusetts | 1,339 | 1,708 | 1,815 | 2,173 | 1,917 | 2,243 | 2,116 | 1,875 | 1,887 | 2,042 |
| Michigan | 450 | 537 | 637 | 727 | 662 | 847 | 768 | 733 | 693 | 812 |
| Minnesota | 44 | 146 | 187 | 210 | 213 | 236 | 288 | 305 | 277 | 289 |
| Mississippi | 39 | 41 | 56 | 51 | 73 | 70 | 52 | 45 | 48 | 48 |
| Missouri | 337 | 410 | 485 | 625 | 573 | 705 | 685 | 654 | 647 | 768 |
| Montana | 3 | 18 | 20 | 17 | 10 | 22 | 24 | 22 | 31 | 27 |
| Nebraska | 31 | 57 | 73 | 87 | 71 | 129 | 131 | 127 | 137 | 294 |
| Nevada | 24 | 14 | 14 | 23 | 17 | 10 | 14 | 15 | 17 | 13 |
| New Hampshire | 111 | 110 | 94 | 139 | 120 | 145 | 157 | 166 | 141 | 159 |
| New Jersey | 518 | 827 | 835 | 1,066 | 955 | 1,155 | 923 | 988 | 863 | 1,061 |
| New Mexico | 2 | 3 | 8 | 11 | 6 | 12 | 12 | 9 | 23 | 18 |
| New York | 2,802 | 3,207 | 3,779 | 4,359 | 3,924 | 4,532 | 4,121 | 4,047 | 3,634 | 4,288 |
| North Carolina | 36 | 64 | 72 | 87 | 58 | 81 | 75 | 66 | 55 | 71 |
| North Dakota | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ohio | 917 | 1,099 | 1,466 | 1,604 | 1,458 | 1,837 | 1,599 | 1,477 | 1,353 | 1,674 |
| Oregon | 22 | 31 | 51 | 76 | 42 | 57 | 60 | 59 | 66 | 51 |
| Pennsylvania | 1,324 | 1,502 | 1,843 | 2,168 | 1,863 | 2,454 | 2,289 | 2,109 | 1,990 | 2,392 |
| Rhode Island | 205 | 278 | 282 | 327 | 304 | 287 | 251 | 224 | 399 | 248 |
| South Carolina | 39 | 45 | 45 | 47 | 64 | 80 | 46 | 52 | 42 | 60 |
| South Dakota | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Tennessee | 82 | 88 | 109 | 124 | 108 | 159 | 136 | 121 | 131 | 126 |
| Texas | 147 | 177 | 190 | 208 | 192 | 277 | 266 | 265 | 239 | 314 |
| Utah | 10 | 17 | 18 | 21 | 24 | 36 | 24 | 21 | 21 | 25 |
| Vermont | 76 | 69 | 100 | 109 | 91 | 115 | 117 | 112 | 89 | 27 |
| Virginia | 99 | 108 | 117 | 122 | 111 | 116 | 122 | 132 | 97 | 146 |
| Washington | 6 | 19 | 17 | 21 | 23 | 22 | 32 | 44 | 26 | 33 |
| West Virginia | 52 | 44 | 59 | 82 | 75 | 70 | 83 | 75 | 62 | 76 |
| Wisconsin | 276 | 238 | 356 | 394 | 399 | 469 | 398 | 427 | 464 | 492 |
| Wyoming | 3 | 3 | 4 | 5 | 5 | 3 | 8 | 4 | 6 | 4 |

Table 26: State–Year Total Patents: 1890–1899

| | year | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1890 | 1891 | 1892 | 1893 | 1894 | 1895 | 1896 | 1897 | 1898 | 1899 |
| state | | | | | | | | | | |
| Alabama | 103 | 82 | 104 | 91 | 88 | 91 | 109 | 97 | 80 | 88 |
| Arizona | 14 | 9 | 16 | 12 | 11 | 6 | 13 | 13 | 19 | 27 |
| Arkansas | 95 | 103 | 102 | 105 | 57 | 75 | 84 | 84 | 92 | 98 |
| California | 640 | 622 | 652 | 688 | 617 | 548 | 526 | 645 | 619 | 731 |
| Colorado | 184 | 199 | 225 | 246 | 207 | 215 | 234 | 187 | 221 | 257 |
| Connecticut | 937 | 733 | 781 | 764 | 751 | 805 | 983 | 949 | 799 | 789 |
| Delaware | 51 | 34 | 33 | 30 | 33 | 34 | 49 | 33 | 45 | 42 |
| Florida | 51 | 52 | 65 | 62 | 46 | 63 | 55 | 81 | 72 | 54 |
| Georgia | 165 | 124 | 95 | 115 | 110 | 114 | 128 | 130 | 106 | 131 |
| Idaho | 12 | 14 | 18 | 21 | 22 | 15 | 20 | 28 | 15 | 28 |
| Illinois | 2,152 | 1,968 | 2,170 | 2,002 | 1,632 | 1,876 | 2,041 | 2,202 | 1,741 | 2,152 |
| Indiana | 670 | 570 | 653 | 564 | 544 | 606 | 615 | 616 | 621 | 655 |
| Iowa | 437 | 427 | 417 | 402 | 334 | 392 | 399 | 424 | 419 | 490 |
| Kansas | 352 | 263 | 287 | 236 | 194 | 206 | 258 | 258 | 263 | 296 |
| Kentucky | 252 | 195 | 240 | 224 | 160 | 210 | 198 | 193 | 203 | 223 |
| Louisiana | 137 | 122 | 122 | 99 | 105 | 120 | 133 | 115 | 97 | 119 |
| Maine | 192 | 142 | 146 | 133 | 104 | 129 | 130 | 138 | 118 | 149 |
| Maryland | 297 | 294 | 287 | 290 | 305 | 260 | 260 | 228 | 245 | 297 |
| Massachusetts | 2,096 | 2,122 | 1,878 | 2,014 | 1,676 | 1,793 | 1,901 | 1,897 | 1,567 | 1,774 |
| Michigan | 980 | 752 | 794 | 782 | 750 | 768 | 701 | 661 | 642 | 805 |
| Minnesota | 379 | 352 | 385 | 359 | 316 | 300 | 350 | 359 | 336 | 394 |
| Mississippi | 55 | 63 | 55 | 57 | 59 | 37 | 47 | 80 | 68 | 95 |
| Missouri | 809 | 786 | 753 | 773 | 726 | 704 | 660 | 663 | 683 | 776 |
| Montana | 53 | 42 | 67 | 78 | 76 | 69 | 68 | 65 | 77 | 90 |
| Nebraska | 225 | 191 | 209 | 191 | 161 | 151 | 151 | 163 | 150 | 164 |
| Nevada | 12 | 10 | 13 | 17 | 10 | 10 | 9 | 12 | 5 | 11 |
| New Hampshire | 172 | 144 | 112 | 113 | 93 | 120 | 109 | 105 | 100 | 122 |
| New Jersey | 1,112 | 960 | 1,001 | 1,002 | 928 | 892 | 994 | 1,049 | 906 | 993 |
| New Mexico | 16 | 14 | 17 | 11 | 11 | 14 | 12 | 11 | 11 | 15 |
| New York | 4,585 | 3,907 | 3,781 | 3,630 | 3,329 | 3,539 | 3,882 | 3,783 | 3,285 | 3,798 |
| North Carolina | 74 | 76 | 85 | 85 | 87 | 65 | 68 | 93 | 71 | 77 |
| North Dakota | 0 | 29 | 26 | 18 | 26 | 27 | 34 | 48 | 48 | 51 |
| Ohio | 1,762 | 1,513 | 1,533 | 1,568 | 1,402 | 1,423 | 1,613 | 1,461 | 1,472 | 1,501 |
| Oklahoma | 0 | 6 | 5 | 12 | 10 | 14 | 16 | 28 | 34 | 46 |
| Oregon | 82 | 71 | 80 | 93 | 72 | 73 | 90 | 109 | 73 | 103 |
| Pennsylvania | 2,641 | 2,197 | 2,130 | 2,253 | 1,904 | 2,270 | 2,319 | 2,464 | 2,172 | 2,355 |
| Rhode Island | 273 | 290 | 252 | 224 | 197 | 226 | 249 | 243 | 218 | 272 |
| South Carolina | 75 | 49 | 69 | 47 | 45 | 41 | 36 | 30 | 48 | 46 |
| South Dakota | 0 | 53 | 64 | 47 | 43 | 51 | 47 | 56 | 57 | 62 |
| Tennessee | 180 | 161 | 133 | 143 | 106 | 135 | 140 | 148 | 155 | 177 |
| Texas | 308 | 330 | 359 | 335 | 271 | 277 | 297 | 379 | 340 | 351 |
| Utah | 30 | 25 | 50 | 62 | 27 | 39 | 39 | 44 | 47 | 43 |
| Vermont | 101 | 55 | 76 | 71 | 78 | 74 | 91 | 70 | 59 | 83 |
| Virginia | 177 | 165 | 151 | 144 | 134 | 155 | 154 | 185 | 177 | 213 |
| Washington | 64 | 79 | 117 | 116 | 89 | 71 | 111 | 99 | 134 | 154 |
| West Virginia | 95 | 74 | 84 | 54 | 74 | 78 | 86 | 99 | 102 | 116 |
| Wisconsin | 634 | 526 | 507 | 560 | 413 | 495 | 474 | 475 | 447 | 545 |
| Wyoming | 8 | 3 | 11 | 20 | 15 | 21 | 22 | 6 | 23 | 18 |

Table 27: State–Year Total Patents: 1900–1909

| | year | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1900 | 1901 | 1902 | 1903 | 1904 | 1905 | 1906 | 1907 | 1908 | 1909 |
| state | | | | | | | | | | |
| Alabama | 95 | 82 | 89 | 134 | 145 | 138 | 131 | 156 | 134 | 184 |
| Arizona | 18 | 19 | 34 | 38 | 32 | 22 | 37 | 38 | 50 | 45 |
| Arkansas | 99 | 102 | 83 | 78 | 100 | 93 | 120 | 150 | 112 | 142 |
| California | 732 | 758 | 854 | 979 | 1,022 | 1,042 | 1,115 | 1,209 | 1,192 | 1,358 |
| Colorado | 278 | 314 | 323 | 404 | 387 | 397 | 383 | 460 | 455 | 471 |
| Connecticut | 755 | 758 | 732 | 912 | 828 | 741 | 845 | 920 | 785 | 1,031 |
| Delaware | 30 | 56 | 43 | 44 | 37 | 47 | 49 | 44 | 49 | 47 |
| Florida | 66 | 53 | 57 | 67 | 76 | 69 | 78 | 111 | 110 | 96 |
| Georgia | 172 | 149 | 162 | 220 | 222 | 224 | 224 | 264 | 239 | 265 |
| Idaho | 33 | 29 | 25 | 32 | 34 | 43 | 64 | 76 | 77 | 76 |
| Illinois | 2,439 | 2,430 | 2,529 | 2,811 | 2,881 | 2,923 | 3,107 | 3,470 | 3,056 | 3,503 |
| Indiana | 625 | 660 | 675 | 788 | 705 | 719 | 782 | 921 | 877 | 931 |
| Iowa | 561 | 571 | 531 | 627 | 641 | 663 | 691 | 679 | 696 | 717 |
| Kansas | 276 | 249 | 277 | 334 | 336 | 389 | 335 | 472 | 434 | 462 |
| Kentucky | 235 | 218 | 232 | 277 | 255 | 243 | 267 | 304 | 281 | 299 |
| Louisiana | 140 | 121 | 88 | 143 | 137 | 159 | 164 | 160 | 167 | 171 |
| Maine | 134 | 155 | 138 | 136 | 121 | 119 | 151 | 178 | 153 | 148 |
| Maryland | 318 | 296 | 312 | 340 | 289 | 290 | 303 | 383 | 230 | 299 |
| Massachusetts | 1,745 | 1,905 | 1,949 | 2,081 | 2,075 | 1,798 | 1,675 | 2,113 | 1,837 | 2,152 |
| Michigan | 773 | 757 | 776 | 950 | 952 | 980 | 952 | 1,110 | 1,042 | 1,086 |
| Minnesota | 417 | 417 | 446 | 501 | 504 | 508 | 503 | 598 | 627 | 639 |
| Mississippi | 74 | 86 | 91 | 70 | 90 | 92 | 100 | 108 | 97 | 115 |
| Missouri | 750 | 809 | 769 | 979 | 941 | 947 | 957 | 1,130 | 955 | 1,159 |
| Montana | 76 | 60 | 75 | 75 | 95 | 103 | 96 | 118 | 105 | 96 |
| Nebraska | 203 | 207 | 220 | 277 | 225 | 219 | 275 | 327 | 323 | 341 |
| Nevada | 11 | 7 | 15 | 13 | 10 | 7 | 12 | 39 | 29 | 38 |
| New Hampshire | 107 | 109 | 94 | 110 | 76 | 92 | 81 | 121 | 109 | 108 |
| New Jersey | 1,020 | 1,198 | 1,173 | 1,228 | 1,297 | 1,271 | 1,298 | 1,504 | 1,427 | 1,562 |
| New Mexico | 9 | 23 | 25 | 23 | 30 | 23 | 28 | 27 | 25 | 40 |
| New York | 3,788 | 4,098 | 4,120 | 4,573 | 4,502 | 4,392 | 4,642 | 5,231 | 4,760 | 5,232 |
| North Carolina | 82 | 103 | 97 | 125 | 124 | 141 | 144 | 153 | 173 | 205 |
| North Dakota | 48 | 45 | 64 | 68 | 50 | 80 | 85 | 134 | 134 | 153 |
| Ohio | 1,718 | 1,720 | 1,830 | 2,156 | 2,178 | 2,116 | 2,167 | 2,493 | 2,277 | 2,538 |
| Oklahoma | 64 | 48 | 48 | 89 | 122 | 97 | 130 | 148 | 215 | 250 |
| Oregon | 103 | 125 | 100 | 125 | 134 | 127 | 161 | 219 | 232 | 239 |
| Pennsylvania | 2,564 | 2,837 | 2,792 | 3,144 | 3,053 | 2,918 | 3,014 | 3,471 | 3,100 | 3,641 |
| Rhode Island | 264 | 271 | 275 | 350 | 284 | 229 | 303 | 271 | 259 | 294 |
| South Carolina | 47 | 47 | 46 | 76 | 70 | 70 | 74 | 72 | 65 | 69 |
| South Dakota | 56 | 43 | 62 | 92 | 85 | 90 | 98 | 127 | 127 | 105 |
| Tennessee | 203 | 194 | 185 | 208 | 213 | 189 | 356 | 232 | 244 | 252 |
| Texas | 373 | 339 | 358 | 434 | 415 | 382 | 437 | 544 | 524 | 544 |
| Utah | 58 | 55 | 44 | 73 | 67 | 68 | 79 | 101 | 92 | 142 |
| Vermont | 69 | 73 | 71 | 63 | 87 | 77 | 87 | 94 | 70 | 66 |
| Virginia | 200 | 192 | 201 | 210 | 233 | 206 | 267 | 274 | 251 | 269 |
| Washington | 163 | 172 | 191 | 230 | 306 | 278 | 327 | 410 | 377 | 472 |
| West Virginia | 121 | 118 | 119 | 152 | 159 | 173 | 203 | 237 | 302 | 198 |
| Wisconsin | 508 | 530 | 521 | 619 | 582 | 636 | 653 | 758 | 702 | 796 |
| Wyoming | 17 | 14 | 15 | 22 | 28 | 40 | 30 | 22 | 23 | 43 |

Table 28: State–Year Total Patents: 1910–1919

| | year | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1910 | 1911 | 1912 | 1913 | 1914 | 1915 | 1916 | 1917 | 1918 | 1919 |
| state | | | | | | | | | | |
| Alabama | 181 | 163 | 181 | 189 | 206 | 203 | 220 | 255 | 196 | 153 |
| Arizona | 49 | 41 | 65 | 71 | 75 | 77 | 104 | 111 | 98 | 82 |
| Arkansas | 135 | 135 | 135 | 141 | 134 | 135 | 155 | 150 | 117 | 89 |
| California | 1,471 | 1,575 | 1,658 | 1,668 | 1,870 | 1,943 | 2,120 | 2,084 | 2,151 | 1,962 |
| Colorado | 447 | 477 | 467 | 436 | 445 | 475 | 454 | 497 | 423 | 385 |
| Connecticut | 990 | 845 | 969 | 968 | 1,176 | 1,129 | 1,112 | 1,059 | 909 | 3,899 |
| Delaware | 43 | 56 | 60 | 40 | 63 | 74 | 80 | 51 | 80 | 93 |
| Florida | 114 | 104 | 124 | 132 | 143 | 141 | 184 | 186 | 160 | 1,129 |
| Georgia | 214 | 224 | 238 | 238 | 241 | 234 | 221 | 250 | 222 | 187 |
| Idaho | 105 | 105 | 94 | 107 | 84 | 104 | 104 | 145 | 121 | 100 |
| Illinois | 3,169 | 3,172 | 3,441 | 3,229 | 3,954 | 4,517 | 4,601 | 4,309 | 3,953 | 3,899 |
| Indiana | 812 | 726 | 776 | 713 | 820 | 955 | 992 | 826 | 827 | 753 |
| Iowa | 604 | 583 | 660 | 606 | 759 | 714 | 880 | 843 | 704 | 604 |
| Kansas | 456 | 382 | 458 | 410 | 430 | 449 | 473 | 455 | 380 | 362 |
| Kentucky | 267 | 240 | 238 | 228 | 243 | 293 | 307 | 306 | 243 | 224 |
| Louisiana | 181 | 165 | 204 | 171 | 198 | 191 | 234 | 193 | 151 | 163 |
| Maine | 149 | 142 | 128 | 113 | 150 | 166 | 163 | 143 | 120 | 116 |
| Maryland | 305 | 272 | 315 | 317 | 398 | 379 | 388 | 348 | 305 | 322 |
| Massachusetts | 2,073 | 1,842 | 2,231 | 1,809 | 2,437 | 2,693 | 2,644 | 2,157 | 2,174 | 1,991 |
| Michigan | 972 | 1,035 | 1,054 | 969 | 1,423 | 1,585 | 1,528 | 1,505 | 1,617 | 1,371 |
| Minnesota | 601 | 475 | 609 | 586 | 664 | 779 | 716 | 787 | 871 | 775 |
| Mississippi | 120 | 113 | 101 | 94 | 115 | 103 | 111 | 99 | 83 | 35 |
| Missouri | 1,097 | 945 | 1,152 | 1,027 | 1,154 | 1,180 | 1,258 | 1,152 | 1,071 | 988 |
| Montana | 96 | 112 | 116 | 132 | 149 | 189 | 191 | 204 | 189 | 167 |
| Nebraska | 345 | 318 | 304 | 274 | 335 | 346 | 381 | 335 | 339 | 264 |
| Nevada | 41 | 39 | 36 | 42 | 32 | 41 | 49 | 54 | 41 | 36 |
| New Hampshire | 126 | 81 | 101 | 98 | 124 | 153 | 137 | 126 | 123 | 122 |
| New Jersey | 1,469 | 1,360 | 1,683 | 1,610 | 1,893 | 2,129 | 2,227 | 2,084 | 1,983 | 1,898 |
| New Mexico | 49 | 50 | 64 | 52 | 45 | 50 | 56 | 49 | 55 | 48 |
| New York | 4,948 | 4,777 | 5,103 | 5,312 | 5,972 | 6,575 | 6,998 | 6,678 | 6,075 | 5,980 |
| North Carolina | 183 | 191 | 168 | 161 | 189 | 177 | 218 | 175 | 194 | 142 |
| North Dakota | 183 | 132 | 151 | 131 | 162 | 161 | 164 | 181 | 146 | 162 |
| Ohio | 2,495 | 2,233 | 2,395 | 2,099 | 2,643 | 2,999 | 2,992 | 2,800 | 2,568 | 2,505 |
| Oklahoma | 260 | 235 | 259 | 263 | 292 | 286 | 330 | 343 | 334 | 268 |
| Oregon | 219 | 246 | 278 | 254 | 337 | 315 | 424 | 371 | 336 | 291 |
| Pennsylvania | 3,418 | 2,919 | 3,356 | 3,085 | 3,469 | 3,941 | 3,862 | 3,509 | 3,163 | 3,111 |
| Rhode Island | 278 | 315 | 279 | 271 | 349 | 301 | 320 | 252 | 298 | 240 |
| South Carolina | 86 | 65 | 84 | 90 | 92 | 90 | 125 | 132 | 106 | 89 |
| South Dakota | 135 | 109 | 149 | 124 | 149 | 163 | 188 | 173 | 156 | 118 |
| Tennessee | 248 | 175 | 210 | 210 | 254 | 240 | 240 | 235 | 199 | 203 |
| Texas | 670 | 591 | 550 | 599 | 619 | 630 | 699 | 653 | 632 | 568 |
| Utah | 124 | 103 | 122 | 121 | 131 | 146 | 137 | 137 | 154 | 131 |
| Vermont | 89 | 61 | 67 | 58 | 80 | 98 | 98 | 80 | 64 | 65 |
| Virginia | 240 | 226 | 276 | 290 | 299 | 334 | 335 | 309 | 290 | 225 |
| Washington | 420 | 410 | 538 | 529 | 563 | 663 | 780 | 675 | 680 | 662 |
| West Virginia | 210 | 196 | 209 | 201 | 238 | 266 | 315 | 253 | 215 | 182 |
| Wisconsin | 832 | 703 | 801 | 763 | 947 | 1,084 | 1,075 | 1,051 | 1,048 | 955 |
| Wyoming | 34 | 26 | 38 | 39 | 45 | 48 | 66 | 50 | 57 | 44 |

Table 29: State–Year Total Patents: 1920–1920

| | year 1920 |
|---|---|
| state | |
| Alabama | 145 |
| Arizona | 80 |
| Arkansas | 112 |
| California | 2,051 |
| Colorado | 414 |
| Connecticut | 961 |
| Delaware | 87 |
| Florida | 137 |
| Georgia | 185 |
| Idaho | 81 |
| Illinois | 3,780 |
| Indiana | 794 |
| Iowa | 676 |
| Kansas | 367 |
| Kentucky | 213 |
| Louisiana | 179 |
| Maine | 123 |
| Maryland | 352 |
| Massachusetts | 1,998 |
| Michigan | 1,413 |
| Minnesota | 771 |
| Mississippi | 83 |
| Missouri | 1,001 |
| Montana | 156 |
| Nebraska | 272 |
| Nevada | 27 |
| New Hampshire | 103 |
| New Jersey | 1,954 |
| New Mexico | 44 |
| New York | 6,273 |
| North Carolina | 169 |
| North Dakota | 156 |
| Ohio | 2,642 |
| Oklahoma | 322 |
| Oregon | 295 |
| Pennsylvania | 3,279 |
| Rhode Island | 248 |
| South Carolina | 94 |
| South Dakota | 111 |
| Tennessee | 241 |
| Texas | 633 |
| Utah | 134 |
| Vermont | 51 |
| Virginia | 291 |
| Washington | 634 |
| West Virginia | 192 |
| Wisconsin | 961 |
| Wyoming | 52 |

# E. Surname Diversity (Robustness Exercises)

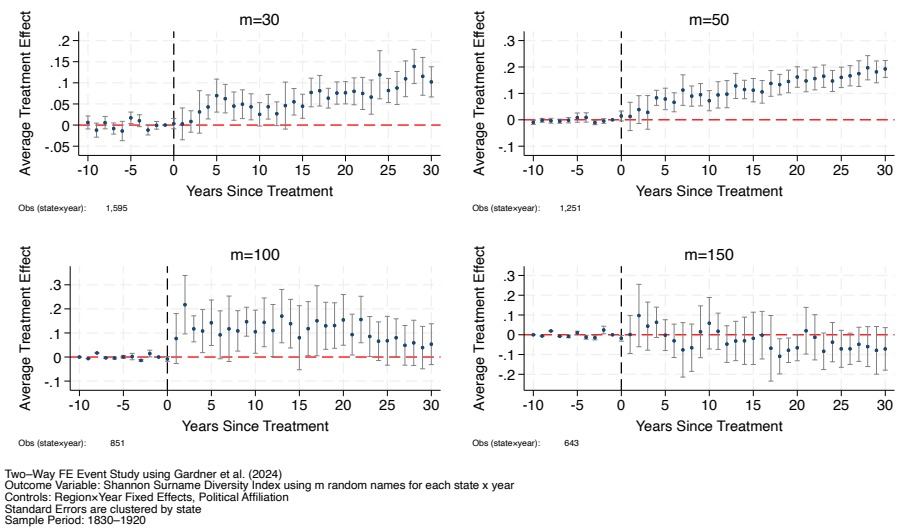



Figure A4: Event Study - Inventor Surnames Diversity - Neutralizing dependence on n

Gardner et al. (2024) event-study regression where the year a state passed the law prohibiting the issuance of special charters by the state is the treatment variable. The x-axis is the relative time to treatment and the y-axis is the increase in inventors' surnames diversity, measured by a Shannon Index. Additional controls to state and year fixed effects are regionyear fixed effects and per-state political affiliation. For each state and year, m number of surnames are randomly chosen for the Shannon surnames diversity index score.

| m | Avg. unique (count) | Avg. unique (%) | Obs (state–year) | Coeff. | Std. Err. |
|---|---|---|---|---|---|
| 30 | 28.0 | 93.2 | 1596 | 0.093 | 0.009 |
| 50 | 45.7 | 91.4 | 1251 | 0.174 | 0.014 |
| 80 | 71.2 | 89.0 | 974 | 0.013 | 0.030 |
| 100 | 87.6 | 87.6 | 852 | 0.097 | 0.025 |
| 150 | 127.2 | 84.8 | 644 | -0.070 | 0.031 |

Table 30: Event Study - Inventor Surnames Diversity - Neutralizing dependence on n Table

# F. Geographic Diversity

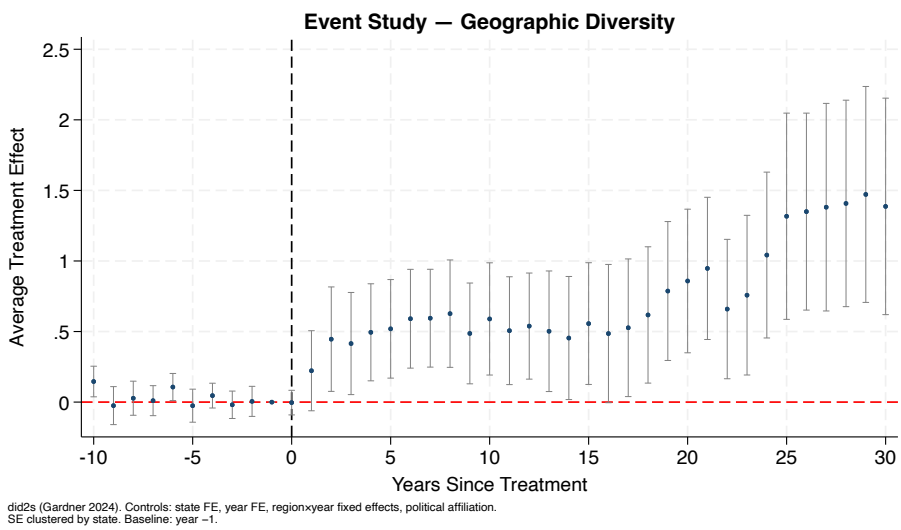



Figure A5: Event Study - Inventor Geographic Diversity

Gardner et al. (2024) event-study regression where the year a state passed the law prohibiting the issuance of special charters by the state is the treatment variable. The x-axis is the relative time to treatment and the y-axis is the increase in inventors' geographic diversity, measured by a Shannon Index. Additional controls to state and year fixed effects are regionyear fixed effects and per-state political affiliation.

Table 31: Geographic Diversity – Another Approach

| | (1) | (2) |
|---|---|---|
| Treatment (SC law) | 3.99*** | -2.48* |
| | (0.99) | (1.29) |
| Sample | All | Existing Cities |
| Method | DID2S | DID2S |
| Weight | non-weighted | non-weighted |
| Observations | 2,784 | 2,784 |

Standard errors in parentheses
Outcome: patents per 100,000 population (all / from existing cities).
Controls: state FE, year FE, regionyear fixed effects, political affiliation.
SE clustered by state.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

# G. General Charts

Distribution of Sectors in Issuance of Special Charters, 1790-1860

| Sector | 1790-1800 | 1800-1810 | 1810-1820 | 1820-1830 | 1830-1840 | 1840-1850 | 1850-1860 |
|---|---|---|---|---|---|---|---|
| Transport, Mining, Utility | 77% | 75% | 52% | 48% | 51% | 56% | 58% |
| Banking, Insurance | 19% | 17% | 23% | 22% | 20% | 17% | 21% |
| Manufacturing | 3% | 2% | 23% | 25% | 25% | 24% | 17% |
| Other | 1% | 1% | 1% | 4% | 4% | 3% | 4% |
| Total | 247 | 779 | 1,525 | 1,577 | 5,142 | 3,793 | 9,356 |

Figure A6: Special Charters, by Sectors (1790-1860)

Figure A1 Note: Special Charters by Sectors, 1790-1860. Source: Wright (2015). The dataset contains 1,590 unique business types. Categorization to four broad categories was done by the author.

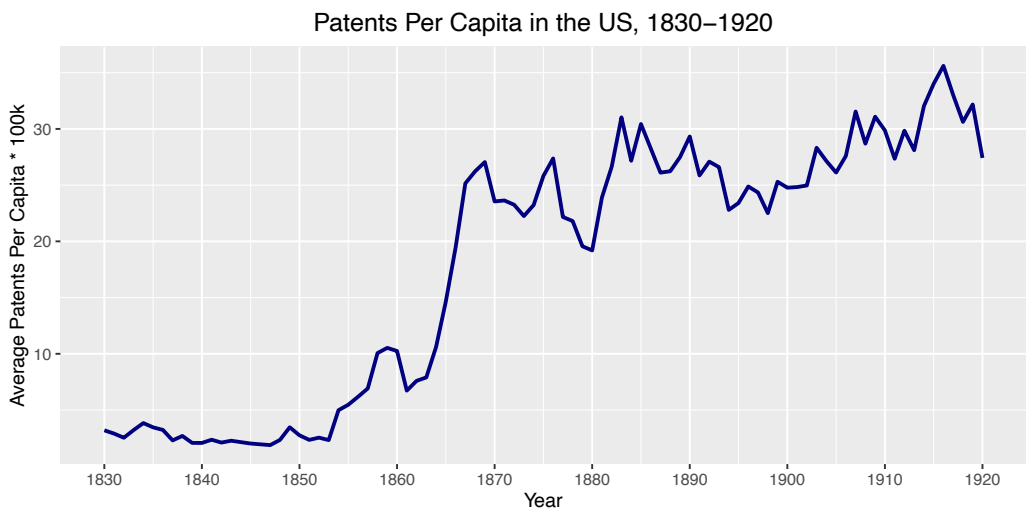



Figure A7: Patents Per Capita in the US, 1830-1920

Annual average of patents per capita * 100k people for each year in the sample period (1830-1920). Total patents are from USPTO annual aggregate tables and population figures are from decennial surveys, extrapolating the years using geometrically. The mean for this period is 17.89 patents per capita per 100k people, and the standard deviation is 11.39

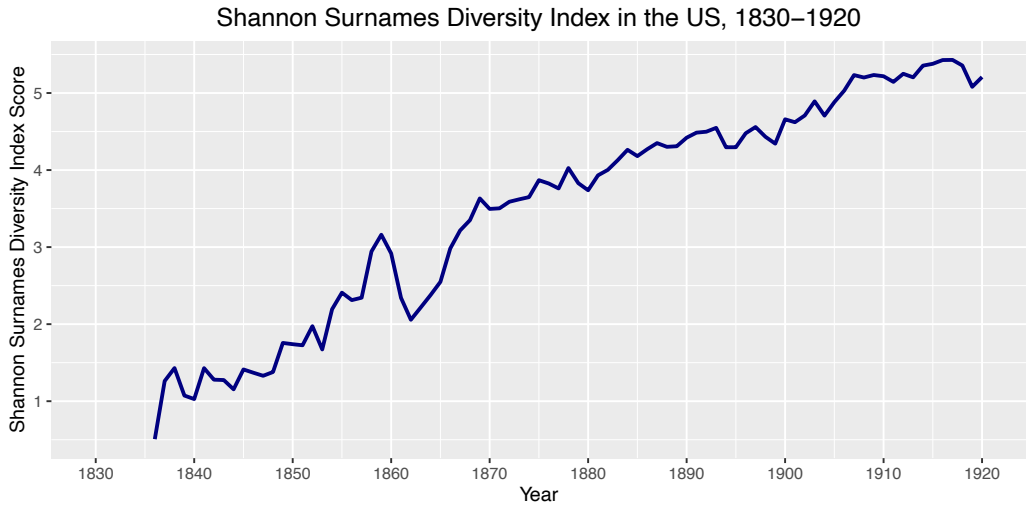



Figure A8: Shannon Surname Diversity Index For Patent Inventors, 1830-1920

Annual average Shannon Surname Diversity Index for patent inventors, for the period 1830-1920

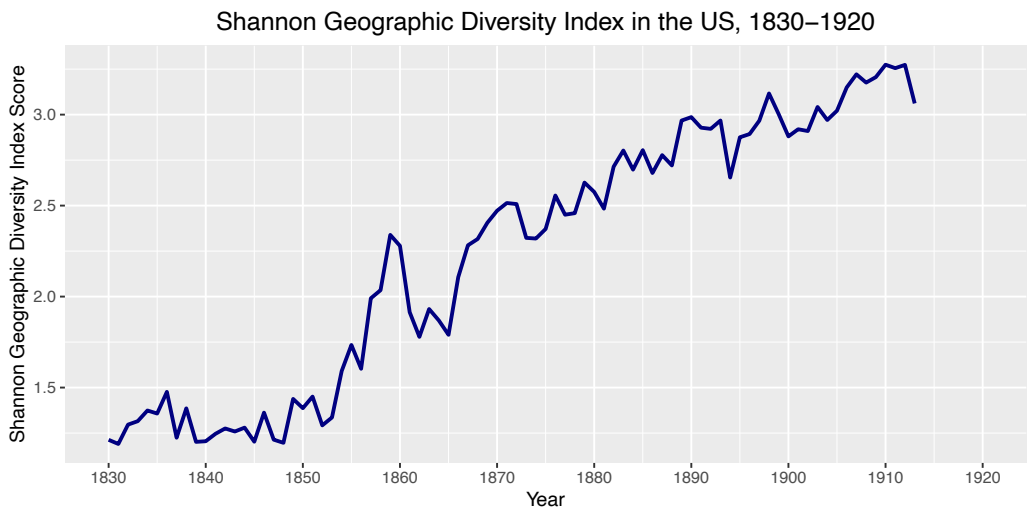



Figure A9: Shannon Geographic Diversity Index For Patent Inventors, 1830-1920

Annual average Shannon Geographic Diversity Index for patent inventors, for the period 1830-1920

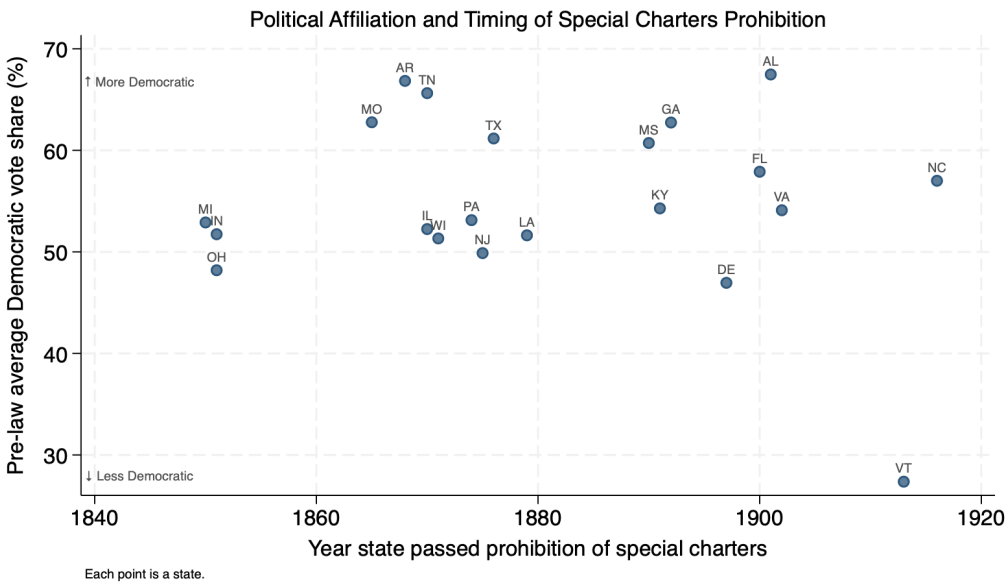



Figure A10: State Political Affiliation vs. Year Prohibiting Special Charters

Each point represents a state that passed a prohibition on special charters by 1920. The y-axis is the state's average Democratic vote share in the years preceding its law change; the x-axis is the year the prohibition was enacted. If more Democratic-leaning states adopted the prohibition earlier, one would expect a downward-sloping pattern. Democratic party classification is by the authors.

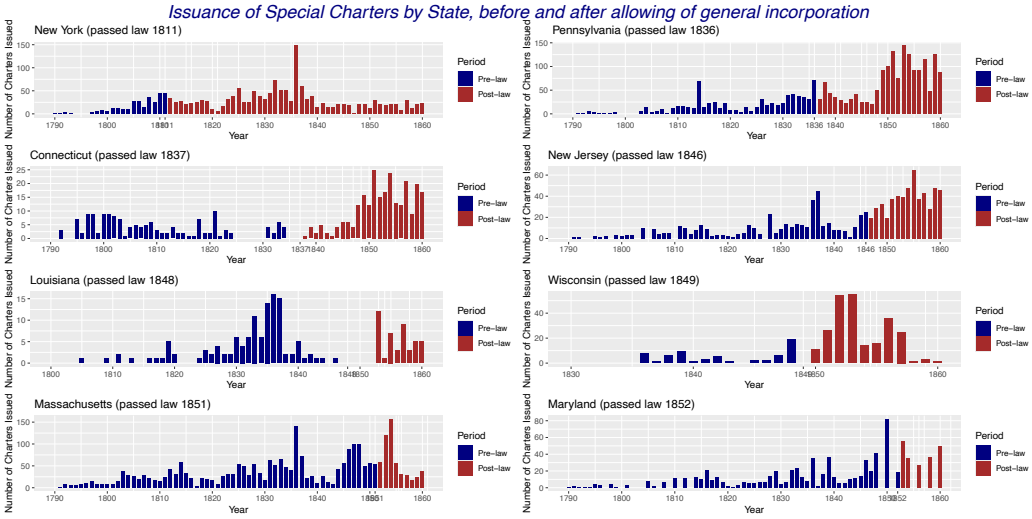



Figure A11: Total annual issuance of special charters by states - before and after allowing general incorporation

Annual issuance of special charters for eight states that adopted general incorporation laws before 1860—the last year covered by Wright (2015). Blue bars indicate years before the general incorporation law; red bars indicate years after. The figure suggests that the introduction of general incorporation alone did not substantially reduce the pace of special charter issuance.

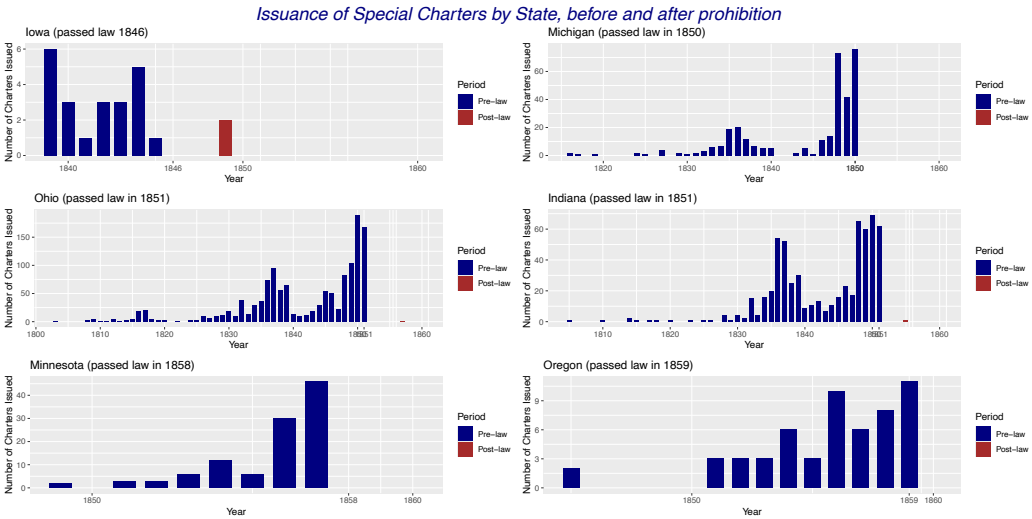



Figure A12: Total annual issuance of special charters by states - before and after prohibition of special charters.

Annual issuance of special charters for six states that enacted a constitutional prohibition on special charters before 1860—the last year covered by Wright (2015). Blue bars indicate years before the prohibition; red bars indicate years after. As expected, the prohibition was effective: special charter issuance dropped to zero or near zero in each state following the law change.

# References


Acemoglu, D., Johnson, S., and Robinson, J. A. (2001). The colonial origins of comparative development: An empirical investigation. American Economic Review.

Gardner, J., Thakral, N., To, L. T., and Yap, L. (2024). Two-stage differences in differences.

George Heberton Evans, J. (1948). The period of the special charter. In *Business Incorporations in the United States, 1800–1943*. NBER.

Hamill, S. P. (1999). From special privilege to general utility: A continuation of willard hurst's study of corporations. American University Law Review.

Hilt, E. (2017a). Corporation law and the shift toward open access in the antebellum united states. In *Organizations, Civil Society, and the Roots of Development*. University of Chicago Press.

Hilt, E. (2017b). Early american corporations and the state. In *Corporations and American Democracy*. Harvard University Press.

Hurst, J. W. (1970). From special privilege to general utility, 1780-1890. In *The Legitimacy of the Business Corporation in the Law of the United States 1780-1970*. The University Press of Virginia, Charlottesville.

Ireland, R. M. (2004). The problem of local, private, and special legislation in the nineteenth-century united states. The American Journal of Legal History.

Jr., F. E. H. (1928). The banking clauses in the constitution of iowa. Indiana University Law Library.

Kelly, B., Papanikolaou, D., Seru, A., and Taddy, M. (2020). Measuring technological innovation over the long run. NBER.

Lamoreaux, N. R. and Novak, W. J. (2017). In *Corporations and American Democracy*. Harvard University Press.

Lamoreaux, N. R. and Wallis, J. J. (2020). Economic crisis, general laws, and the mid-nineteenth-century transformation of american political economy. NBER.

Leip, D. (2020). Dave leip's atlas of u.s. presidential elections.

Machlup, F. and Penrose, E. (1950). The patent controversy in the nineteenth century. The Journal of Economic History , Volume 10 , Issue 1.

Olivetti, C. and Paserman, M. D. (2015). In the name of the son (and the daughter): Intergenerational mobility in the united states, 1850-1940. American Economic Association.

Seller, C. (1991). In *The Market Revolution: Jacksonian America, 1815-1846*. Oxford University Press.

Shannon, C. E. (1948). A mathematical theory of communication.

Wallis, J. J. (2004). The concept of systematic corruption in american political and economic history. NBER.

Wright, R. E. (2009). Rise of the corporate nation. NBER.

Wright, R. E. (2013). Corporation formation in the antebellum united states in comparative context. Business History, 55:4, 653-669.

Wright, R. E. (2015). Us corporate development 1790-1860.