What Happens When the States Regulate First? Analyzing Governance of the Telegraph Industry in the Antebellum United States

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Abstract: Studies of regulation in the United States often assume that the federal government has been the major initiator of regulatory behavior and that the emergence of a regulatory state has been a modern phenomenon. This view, to some degree, belies the experience of the U.S. states, who engaged in regulatory behavior prior to the Civil War. In this paper, I utilize data on the adoption of telegraph regulation policies by the U.S. states in the 1840s and 1850s (when the telegraph was new and cutting-edge technology) in an attempt to gain purchase on what explains the rise of regulatory behavior in an era considered to be largely devoid of such activity. Using pooled event history analysis to fully capture temporal and cross-sectional variation in state policy adoption activity and employing a bevy of explanatory variables across multiple empirical specifications, I find evidence suggesting that the emergence of mass public schooling corresponds with a greater likelihood of regulatory behavior. I argue that mass schooling (usually financed through public taxation) helped create legitimacy in the view that government should utilize policymaking power toward the public good, which furthered regulatory behavior. The result potentially sheds light on the emergence of the American regulatory state in the nineteenth century and may help us understand attempts to deprofessionalize American state government in the twenty-first century.

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Introduction

Modern theories of regulation often assume that government possesses the capacity to regulate.[2] For instance, accounts of whether state legislatures are able to create policy that is adequate enough to address societal challenges—to create the scope conditions under which effective regulation can occur, as it were—often emphasize the level of professionalism (or resource capacity) that a legislature can marshal in performing its duties. Research on the ease with which states embraced electricity restructuring (Ka and Teske 2002); the ability to inspect nursing homes effectively (Boehmke and Shipan 2015); the rapidity with which states were able to engage in competition for luring corporate investment (Arel-Bundock and Parinandi 2018); and the thoroughness with which state medical and pharmacy boards enforce opioid prescription policies (Fortunato and Parinandi 2022) all points to the pivotal role that highly professional legislatures—taken by Squire (2017) and others to imply full-time and salaried legislators equipped with extensive staff to help with legislative work—have played in making the states a major locus of policy adoption and implementation within the United States. Another strand of research focusing on contemporary bureaucratic behavior in the American states has shown that greater resource capacity (in a word, professionalization) has fueled the rise of increasingly consequential state agency actors in state-level policymaking (Boushey and McGrath 2017; and Boushey and McGrath 2020). Indeed, the common and current view positing that the states could serve as the primary policymakers and problem solvers in the United States (and thereby bypass

[2] By *regulation*, I refer to the idea that government possesses the wherewithal to establish the ground rules through which private interests interact with the general public (Dal Bo 2006).

federal government dysfunction) is predicated in large part on the idea that state governments are well-resourced in the first place.[3]

The early history of the United States, however, provides a glimpse into what state-led policymaking looked like in an era when the states lacked any modicum of what we today would call a professionalized level of resources. Aided by a belief that it was not the place of the federal government to dictate or distort the policy preferences of the states (Volden 2004; and Bednar 2009), the states were the main drivers of policymaking in the United States for much of the nineteenth century. The state governments, and particularly the state legislatures which were the chief organs of state government, were skeletal outfits, employing "a clerk or two, a doorkeeper, and a sergeant-at-arms." (Squire 2019: 420). The lack of substantial resources among state legislatures occurred in the midst of technological innovation, which created the possibility of a scenario where resource-poor legislatures would be tasked with adopting policy dealing with novel regulatory issues. This scenario was arguably manifested in the decades immediately preceding the Civil War, when citizen (or non-professionalized)[4] state legislatures developed various approaches to regulating the new technology of the telegraph (Nonnenmacher 2001).

[3] For a summary of this view, consult the introductory chapter of Parinandi (2023).

[4] Although twenty-first century state legislative politics scholars refer to current less professionalized legislatures as "semi-professional" to avoid the pejorative implication of the term "non-professional," pre-Civil War state legislatures were arguably actually non-professional in the sense that they did not possess the staff, salary, and session length resources that would even make them semi-professional in character (Squire 2019).

The issue of what motivated citizen state legislatures to develop policy in the novel regulatory area of the telegraph has been understudied, is enormously important, and is the goal of this paper. Studying this topic is worthwhile for three reasons. First, since much esteemed work on state policymaking emphasizes the key prominence of professionalism in the development and adoption of state policy (for exemplars of this work, see Walker 1969; Kousser 2005; and Boehmke and Skinner 2012), it behooves us as analysts to evaluate how state adoption occurs when professionalism is largely absent from state government (as was the case in the years after the invention of the telegraph). Understanding how state policy adoption occurs in the absence of professionalism leads to the second and third benefits of exploring this topic: one of these is that we may be able to use the example of state policy adoption absent professionalism to add to the conversation about what fueled the rise of state governmental professionalism in the first place. The final benefit has more of a contemporary spin. Recent decades have seen dedicated attempts to *de-professionalize* state legislatures and potentially return them to the nineteenth century model of citizen-driven bodies (Kousser 2005; and Squire 2006). Knowing the factors that propelled some states into devising and adopting policy solutions in an era of non-professionalized government may help us identify potential factors that can forestall deprofessionalization in the current era.

My choice of analyzing regulatory policy adoption concerning the telegraph industry is appropriate. Samuel Morse's successful demonstration of a working telegraph in 1844 catalyzed state-level attempts to regulate the industry that began in earnest in 1845 (Du Boff 1980; and Nonnenmacher 2001). In the period over the next fifteen years, the states grappled with and adopted a number of different design choices—pertaining to protecting the physical infrastructure of telegraph installations; establishing where telegraph lines could be constructed;

establishing sanctions for if a message transmitted over a telegraph system were given to a third-party; establishing the types of messages that must be carried by a telegraph operator; and establishing the order through which messages must be carried by a telegraph operator—that collectively made up America's state-level telegraph regulatory patchwork prior to the Civil War.[5] The emergence of telegraph technology and state attempts to regulate this technology fits with the classic policy diffusion paradigm (Rogers 1962) that has been established in the political science literature and applied to a myriad number of contemporary issues, including lottery systems (Berry and Berry 1990); anti-smoking regulation (Shipan and Volden 2006); criminal justice reform (Boushey 2016); and renewable energy regulation (Parinandi 2020; and Parinandi 2023). Viewing state telegraph regulation policy adoption as part of a classic diffusion process and using event history analysis to differentiate internal and external (i.e. diffusion-related) drivers of adoption, we can get purchase on how adoption occurred in the era of non-professional state legislatures and sort out a number of different possibilities that may have engendered such adoption.

This paper proceeds as follows. I first discuss the importance of the telegraph invention and how it spawned attempts at state regulation. Included in this discussion is a description of a seminal paper on telegraph regulation by Nonnenmacher (2001). My paper builds substantially on the work of Nonnenmacher, and I therefore give space to describing that previous scholarship here. I then describe how my paper builds on Nonnenmacher's, and I explain how the use of

[5] After the Civil War, the firm Western Union established a monopoly over the telegraph industry (Nonnenmacher 2001). Additionally, Nonnenmacher (2001) refers to the state design features as "protect," "right-of-way," "disclose," "accept," and "order."

pooled event history analysis allows us to ascertain how a wide variety of factors—including potential temporal, diffusion, educational, industrial, demographic, and political explanations—can be evaluated to account for the adoption of state-level telegraph regulation (here, I also discuss why these different explanations could account for the adoption of state-level telegraph regulation). I then finish discussing my empirical procedure before moving onto presenting and interrogating results. I close with a treatment of why results in this paper matter for the broader issue of professionalism in state legislative institutions.

Building on Existing Work about Telegraph Regulation Adoption

The creation of the telegraph was a seminal event of the nineteenth century and promised to spark a revolution in communication across the United States. This event has received attention from scholars, and one such example is Nonnenmacher (2001). In his piece, Nonnenmacher provides a chronology of state-level adoption of telegraph regulation in the pre-Civil War period and starts in 1845, when the first state (New Jersey) promulgated a telegraph regulation policy, and ends in 1860. Nonnenmacher identifies five different facets of state telegraph regulation, and he identifies when each state adopted each facet of telegraph regulation.[6] Although some states (for example, California) adopted all five facets in the same year, some states (for example, New York) adopted different facets in different years. Some

[6] These are, as discussed earlier, protecting the physical infrastructure of telegraph installations; establishing where telegraph lines could be constructed; establishing sanctions for if a message transmitted over a telegraph system were given to a third-party; establishing the types of messages that must be carried by a telegraph operator; and establishing the order through which messages must be carried by a telegraph operator.

states, such as Oregon, had not adopted any of the five facets—and hence had not adopted any telegraph regulation policy—by 1860. Table 1 displays when each state adopted its specific telegraph regulation policies.

<TABLE 1 ABOUT HERE>

As can be discerned from the table, states from every region that then encompassed the United States, including states that would remain in the Union and those that would secede as well as states that were original states in the Union alongside those that had just gained statehood, adopted telegraph regulation policies. Most states adopted the protection of installation and right-of-way facets while some states embraced all five telegraph regulation policy options. In his 2001 paper, Nonnenmacher followed his chronology of state telegraph regulation with a short analysis of which states were most likely to adopt telegraph regulation policies. Distinguishing between "enabling" policy adoption (which he argues contains the protect installations and right-of-way policy options) and "regulatory" policy adoption (which he argues contains the other three policy options), Nonnenmacher conducts probit analyses on whether a state adopted enabling and regulatory policy respectively—the sample sizes of each probit analysis is 34 representing the number of states in the analysis—and finds that having a high score on the Savage Index predicts state adoption of telegraph regulation policy. The Savage Index is a measure of late nineteenth century policy innovativeness devised by Savage (1978). This index captured the speed at which states adopted "policies such as compulsory school attendance, complete female suffrage, maximum hours for labor, professional licensing, prohibition of alcohol, and income taxes" in the "postbellum" period (Nonnenmacher 2001: 31). The Savage Index was the only predictor used in Nonnenmacher's quantitative analysis. A

takeaway from this analysis is that future propensity to adopt policies increasing the scope of governance increases the likelihood that a state adopts telegraph regulation policy.

The analysis provided by Nonnenmacher is useful but leaves room for exploration. First, the inclusion of a predictor from the future goes against the unidirectionality of time and assumes that state attributes in the postbellum period (an era including the 1870s and 1880s) are the same as state attributes in the 1840s and 1850s. Second, Nonnenmacher's probit analysis discards valuable information from temporal and data granularity perspectives. The use of only one observation per state means that we lack full longitudinal data on policy adoption activity within and across states to gauge how the passage of time and other covariates influence the adoption of telegraph regulation policy. The lumping of five different telegraph regulation policy facets into two types deflates the number of instances of telegraph regulation policy adoption that actually occurred in the states, suggesting a need for an updated analysis that utilizes the full range of dependent data.

In this paper, I offer such an updated analysis and employ event history analysis using all five telegraph regulation policy facets to uncover potential causes of telegraph regulation policy adoption in view of the longitudinal history of such adoption. In employing my analysis, I am able to ascertain how multiple factors, including those which are intrinsic to a state as well as those that describe linkages between states, influence telegraph regulation adoption. There are good reasons to think that a number of different factors could have impacted state-level decisions to regulate the telegraph industry. First, several studies of policy adoption (Box-Steffensmeier and Jones 2004; Boushey 2010; Carter and Signorino 2010; and Kreitzer and Boehmke 2016) indicate that the passage of time itself may spur adoption. In the case of telegraph regulation, this takes the form of the passage of time increasing the pressure on states to utilize regulatory power

to allow the telegraph industry to develop in an orderly fashion. Another possible motivator of states adopting telegraph regulation (that also comes from the policy adoption literature) is that a state may be more likely to adopt a telegraph regulation policy if another state has done so. This is emblematic of a diffusion process (Karch 2007) and can occur for different reasons, including if one state wants to compete with another state in developing an industry; if one state wants to cooperate with another state in pursuing a common interest; and even if one state wants to imitate what another state is doing (Shipan and Volden 2008). Regardless of motivation, a positive diffusion process entails a state trying to replicate the decision-making of a benchmark state or group of benchmark states. Although diffusion processes have, to my knowledge, rarely been explored in such an early (pre-Civil War) context, I have no reason to believe that diffusion did *not* occur among the states in the 1845-1860 period. Indeed, the comparable (to the present) localness of American politics as well as the importance of the states as major loci of policymaking in this era (see Bates 2021 for good insight into the debate about how much power the federal government actually wielded in the nineteenth century) suggest that geographic neighbor-based policy diffusion probably occurred in the U.S. states in the decades before the Civil War.

There are other potential drivers of telegraph regulation adoption. The telegraph was designed to promote quick communication across long distances; this benefit may have made the technology particularly desirable to policymakers in states with low population densities who may have embraced telegraph regulation as a means to spur telegraph development in their states. Another potential driver of telegraph regulation adoption is whether a state has significant railroad stock or not. A state's level of railroad stock may predict its likelihood of adopting telegraph regulation for two reasons: first, a high amount of railroad stock suggests that a state is

already transitioning to an industrial economy, and the telegraph (along with concordant regulation dictating how telegraph lines should be constructed and operated) was a core component of industrialization (Lubrano 2012); and second, railroads were ostensibly subject to some level of state regulation, possibly suggesting that having high railroad stock better familiarized a state with the nuance of regulation and made a state more amenable to regulating the emergent telegraph industry. A third potential driver of telegraph regulation adoption is the existence of organs of public education in a given state. A sizeable literature in economics (Goldin and Katz 1997; Stoddard 2009; and Go and Lindert 2010) details how the growth of public schooling in the United States created a tolerance for utilizing public intervention toward action that could lead to public benefit and also helped to create legitimacy in public intervention by espousing the idea (albeit in a limited form) that such intervention can engender a nascent advance of equality of opportunity among the public. Given that much regulation in its very essence involves (1) the use of government intervention to secure public benefit through establishing bounds for how regulated entities interact with the public and (2) a claim for establishing some modicum of equality of opportunity among the public as a justification for government action, it is possible that a state's embrace of public schooling may have increased that state's propensity of adopting telegraph regulation.

A last set of potential drivers of state telegraph regulation adoption centers on the preferences of state-level policymakers themselves. Much focus has been placed on difference between political parties in early American history with respect to regulation and specifically with respect to the Federalists compared to the Democratic-Republicans on the issue of the use

of regulation as an accepted and valuable tool of public policy (Elkins and McKitrick 1993).[7] Given that the Democratic Party was the successor to the Democratic-Republicans, it is possible that states with higher levels of Democratic Party officeholders would be less likely to adopt telegraph regulation policies. In sum, there are many potential catalysts of state telegraph regulation policy adoption and in the next section, I will elaborate further about the empirical procedure used in this paper.

The Empirical Procedure Utilized Here

As discussed earlier in the paper, I employ pooled event history analysis to investigate the determinants of state telegraph regulation policy adoption. A major issue in event history modeling concerns when the period of observation begins for adopting a given policy or, to put it differently, when a state is "at risk" or has the opportunity to adopt a given policy (Box-Steffensmeier and Jones 2004). In this paper and for each of the five distinct telegraph regulation policy choices, I start the period of observation for all states in the year when the first state (of any state) adopted that same distinct policy. I follow the dictates of event history modeling and remove a state from being at risk of adopting a telegraph regulation policy once it has already adopted that policy. A state that never adopts a given telegraph regulation policy by the end of the study period (1860) still is at risk of adopting that policy at the conclusion of the study period.

[7] The division is typically thought to be that the Federalists favor economic regulation as a means of industrial development while the Democratic-Republicans were disinclined toward economic regulation.

An illustration helps to solidify the aforementioned description of data structure. In 1845, New Jersey was the first state in the U.S. states to adopt a policy regulating the right-of-way for telegraph lines. Since New Jersey was the first state to enact this policy, *every* state (including New Jersey) possesses the opportunity (or is at risk) of adopting a right-of-way policy beginning in 1845.[8] No other state adopted this policy in 1845. Therefore, in 1846, New Jersey has been removed from being at risk of adopting a right-of-way policy (it did this in 1845 and hence should not have the opportunity to adopt right-of-way policy in 1846). Every other state, however, is at risk of adopting a right-of-way policy in 1846 (no other state does). In 1847, nine states—Georgia, Maryland, Michigan, North Carolina, Pennsylvania, Rhode Island, Tennessee, Vermont, and Virginia—adopt right-of-way policy and drop out of being at risk for doing so in subsequent years (e.g., they no longer have the opportunity to adopt right-of-way policy from 1848 to 1860). Delaware, which never adopted a right-of-way policy as of 1860, retains the opportunity to adopt a right-of-way policy from 1845 through 1860.

I use the framework described in the previous paragraph for all five telegraph regulation policy choices, I pool the risk sets (or opportunity sets if one prefers a euphemism) of each of the five telegraph regulation policy choices together, and I then conduct analysis on what made a

[8] There is no hard rule in the event history literature about how much left-censoring should be tolerated (in other words, about when the period of observation should begin for states adopting a particular policy). I begin the period of observation for a particular policy in the year when the first state adopted that policy based on the idea that we do not know how far in the past state policymakers even knew about regulatory challenges from technological breakthroughs to even think about how to draft regulatory policy.

state more or less likely to adopt telegraph regulation policy. There are some points worth mentioning here. First, some states come into existence in the middle of the 1845-1860 study timeframe. For example, Minnesota became a state in 1858. Since Nonnenmacher's data details state (and *not* territorial) telegraph regulation policy adoption, I add Minnesota to the risk sets of adopting each of the five telegraph regulation policies once it became a state in 1858 (this is to say that I do not capture the adoption risk or opportunity structure of U.S. territories). Second, adopting one of the five distinct telegraph regulation policies does not impact the risk or opportunity structures of the other four telegraph regulation policies. The states embraced an *a la carte* approach to adopting telegraph regulation policies with some states (California, for example) adopting all five policies while others (Arkansas, for example) adopted some but not all telegraph regulation policies; it bears repeating that Delaware chose to not even specify right-of-way demarcation for its telegraph lines! Keeping the five distinct policy risk sets unconditional in nature reflects the a la carte approach that many states took to adopting telegraph regulation policy.

Lastly, even though 1845 is the beginning of the study timeframe (corresponding to when New Jersey and New York are the first states to adopt telegraph regulation policies when New Jersey adopts right-of-way and telegraph installation protection policies while New York adopts telegraph installation protection policy) and 1860 is the end of the study timeframe (corresponding to the impending onset of the Civil War), it warrants emphasizing that states only gain the risk or opportunity to adopt a given telegraph regulation policy in the year when that policy is first adopted by a U.S. state. Policies establishing penalties for disclosing the contents of a telegraph message, establishing which telegraph messages had to be accepted by an operator, and establishing the order through which an operator had to relay messages were first

adopted by any U.S. state in 1847, 1848, and 1847 respectively; therefore, no state had the opportunity to adopt any of these three policies until 1847, 1848, and 1847 respectively.

The dependent variable, ***Adoption***, is binary and takes a value of 1 if a state adopts a telegraph regulation policy and 0 otherwise. I include a number of right-hand-side variables to account for the possibility that any of potential explanations discussed earlier in the paper could be influencing the adoption of telegraph regulation policy. I account for the possibility that the passage of time itself may increase the likelihood of state adoption of telegraph regulation policy by including three time variables: ***Year***, a linear parameterization of the advance of time from 1845 through 1860; ***Quadratic Year***, a squared parameterization of the linear time variable; and ***Cubic Year***, a cubed parameterization of the linear time variable. I include all three to follow the sage advice of Carter and Signorino (2010), who argue that all three time variables together guard against the possibility that year fixed effects (Beck, Katz, and Tucker 1998). As suggested by Carter and Signorino (2010), I square and cube a demeaned measure of the linear year variable to reduce multicollinearity in the time parameterizations.

I account for the possibility that states could look to each other in making policy decisions (e.g. diffusion) by including ***Fraction of Neighbors***. The denominator of this variable simply captures the number of states bordering a given state; the numerator of this variable, on the other hand, captures the number of number of states bordering that same state that had adopted some telegraph regulation policy as of year *t-1*. This variable captures whether or not a state is located in a geographic neighborhood of states where telegraph regulation policy is being embraced and should relate positively with the likelihood of whether a state adopts a telegraph regulation policy.

I include other variables to address potential explanations behind the adoption of telegraph regulation policy. A state's ***Population Density*** is simply its population divided by its land area (these values are taken from the most recent previous edition of the United States Census for a given year in the data); a state with lower density may be more likely to adopt telegraph regulation policy. State-level ***Railroad Mileage*** comes from Wicker (1960) and captures a state's estimated mileage of railroad track as of the most recent previous decennial point (estimates were reported for 1840, 1850, and 1860; hence, a state's railroad mileage value for 1856 would be the 1850 estimate for that state).[9] If a state's emergent proto-industrialization (and I assume here that railroad mileage varies positively with proto-industrialization) leads to a greater push for telegraph regulation policy adoption, then railroad mileage may relate positively with the likelihood of a state adopting telegraph regulation policy. I account for the possibility that the existence of public education in a state could be facilitating telegraph regulation policy adoption by including the number of ***Public Schools*** in a state; this variable comes from United States Census estimates for 1840, 1850, and 1860 and should relate positively with adoption if states with a greater public school infrastructure are more likely to embrace telegraph regulation policymaking.

Lastly, I account for the preferences of state policymakers by including a variable capturing whether the winner of a state's most recent gubernatorial election was a Democrat (the variable is called ***Democratic Governor*** and comes from Dubin 2003), a variable capturing the

[9] I generally use the Poor's estimates from the railroad mileage data. When a Poor's estimate is not available for a given state-decade, I use the Pacific Railway Report. A no value in the railroad data report (Wicker 1960) is assumed to be a zero value.

percentage of Democrats who won seats in a state's lower chamber in the most recent legislative election (this variable is called ***Democratic House Percentage*** and comes from Dubin 2007), and a variable capturing the percentage of Democrats who won seats in a state's upper chamber in the most recent legislative election (this variable is called ***Democratic Senate Percentage*** and comes from Dubin 2007). Assuming that the Democratic Party had greater anti-regulatory preferences than alternative parties in this period, states with a stronger Democratic Party presence (reflected by the three aforementioned variables) may be less likely to adopt telegraph regulation policy.

I also include a few control variables in my analysis. ***Prior Adoption*** captures the fraction of available telegraph regulation policies that have already been adopted by a state as of year *t-1*. ***Slave Population*** captures the number of slaves reported in a state's population according to the most recent and prior United States Census. ***Higher Education Institutions*** captures the number of colleges and universities in a state (there is no distinguishing information articulating whether these colleges and universities are public or private, and they are probably private given that this time period occurred before the passage of the Morrill Act) and reflects the possibility that a state with a higher number of post-secondary institutions may be more likely to adopt telegraph regulation policy. I finally include ***White Adult Illiteracy*** (taken from decennial United States Censuses), which captures the number of illiterate White adults in a state, in my analysis.

I utilize different empirical model specifications. In model 1, I employ logistic regression with standard errors clustered by state. In model 2, I employ logistic regression with state fixed effects and standard errors clustered by state. In model 3, I employ logistic regression with state fixed effects, year fixed effects (to account for temporal shocks that may be driving the adoption

of telegraph regulation policy). Finally, as a robustness check, in model 4, I employ logistic regression with state random effects.

Results and Discussion

<TABLE 2 ABOUT HERE>

Table 2 displays the results from my various regression analyses. There are findings worth noting. First, the passage of time (especially in the linear year parameterization) is strongly linked to the adoption of telegraph regulation policy (and is significant in the same direction across all four model specifications), and this finding makes sense considering that states should be more likely to regulate an industry as time from the introduction of a technological breakthrough elapses. Another finding worth mentioning concerns whether geographic diffusion (captured with the Fraction of Neighbors variable) has occurred in telegraph regulation policy adoption; results here are inconclusive as only two models (and most importantly not including the model accounting for temporal shocks through year fixed effects) indicate that geographic diffusion occurred in the telegraph regulation area. The inconsistent result reflects the possibility that diffusion may have become more pronounced in American federalism as technological change elicited faster travel and communication; one would need to gather policy adoption information over a span of hundreds of years (incorporating information about various dimensions of technological change) to assess this possibility.

The lack of consistent significance in population density and railroad stock suggests that these explanations probably do not account for telegraph regulation policy adoption (although the consistently positive relationship gleaned from the Railroad Mileage variable suggests that a higher level of proto-industrialization may spark a greater likelihood of regulation; this is an

insight that dates back to Woodrow Wilson and should perhaps be expected here).[10] Political (or preference) variables also fail to explain telegraph regulation policy adoption, as the Democratic Governor, Democratic Senate Percentage, and Democratic House Percentage variables all remain insignificant across all model specifications. One possibility here is that Democratic Party policymakers' anti-regulatory tendencies did not extend onto telegraph technology in the same way that those tendencies may have been applied to issues such as free trade. Another possibility is that party labels in this era map on poorly to preferences for or against regulation; indeed, there was enough within-party heterogeneity (Democrats included those who "hardly endorsed market expansion without reservation" as well as those who "wanted to pilfer the Whig economic agenda and claim credit for its success") that party affiliation may have been a bad predictor of regulatory preference (Ford 2008: 130-131). The variable capturing slave population is also insignificant, suggesting that the presence of slavery in a state did not directly influence the likelihood of telegraph regulation policy adoption.

One variable that does relate positively and significantly (albeit at a small magnitude) to telegraph regulation policy adoption is the Public Schools variable, which captures the number of common and public schools in a state as reported in the decennial United States Census. Figure 1 displays the predicted probability of telegraph regulation policy adoption as the number of public schools variable changes.

<FIGURE 1 ABOUT HERE>

As figure 1 demonstrates, as a state's number of public schools increases, that state's propensity to adopt telegraph regulation policy also increases. Naturally, uncertainty in the

[10] See Wilson (1941) for details.

predicted estimate increases as the number of public schools increase (the mean value of this variable is 1753, meaning the centroid of the estimate is located near 2000 public schools in a state); however, the trend is unmistakably positive and implies a positive association with the likelihood of telegraph regulation policy adoption. States with the highest number of public schools include some of the most dynamic and pro-regulatory states of the era, including New York and Ohio, which each numbered over 10,000 common and public schools according to Census data. States with the lowest number of public schools include Arkansas, Delaware, and Florida, which were all slow in adopting telegraph regulation policy.

One argument linking acceptance of public schooling to a greater likelihood of regulation could be derived from scholars like Goldin and Katz (1997), Stoddard (2009), and Linkert and Go (2010), who investigate the origins of mass schooling in the United States. Mass schooling emerged (mainly in what are today the Great Lakes states as well as the Northeast) through channeling public taxation toward the building of school infrastructure and the hiring of personnel. The acceptance of utilizing public monies toward a goal that is supposed to ostensibly benefit the public (mass schooling) requires great legitimacy in the idea that governmental action is an appropriate means of working in the direction of goals deemed beneficial to the public, and I would argue that accepted deployment of intervention in one area (education) increases the probability that the use of governmental power is accepted in other areas (telegraph regulation). The emergence of telegraph regulation among frontrunners could therefore be an indication of acceptance in the authority of government to manage the public good through policymaking. My finding comports with the work of Nonnenmacher (2001), who found that a state's score on the postbellum Savage Index (which includes a slew of progressive reforms including compulsory school attendance) predicted adoption of telegraph regulation; I use temporally contemporaneous

and prior predictors and incorporate a host of controls and model specifications to provide heft to the idea that attitudes toward public education may drive regulatory behavior.

There are, to be sure, lacunae worth mentioning. The variable capturing a state's number of higher education institutions, for starters, fails to achieve a systematic and consistent relationship with a state's likelihood of adopting telegraph regulation policy. My argument for why this occurred is that the number of public schools and the number of higher education institutions does not capture the same phenomenon. While public schools were funded through public taxation and tasked with providing a modicum of general access, institutions of higher education were "finishing schools" largely occupied by the elite (Elliott 1975). If these finishing schools were private, as accounts of the 1862 Morrill Act suggest they were (Gavazzi and Gee 2018), then we should not expect the number of institutions of higher education to impact the adoption of telegraph regulation.

Another issue worth discussing is that white illiteracy (captured by the White Adult Illiteracy variable) does not relate to the adoption of state telegraph regulation policy. The white adult illiteracy variable captures all White adults who are illiterate. There is anecdotal evidence that white adult illiteracy is associated with a higher number of public schools.[11] Why, then, does white adult illiteracy not relate positively with the likelihood of adopting telegraph regulation

[11] A simple correlation between the two variables yields a coefficient of 0.427. A simple bivariate regression with state fixed effects and year fixed effects (and standard errors clustered by state) where number of public schools is the dependent variable and white adult illiteracy is the independent variable yields an estimated slope coefficient of 0.105, a standard error value of 0.038, and a p-value of 0.01.

policy? One potential argument that comes to mind is that the development of a public school infrastructure was one tool but not a universally implemented tool to combat white illiteracy. Some states, like Massachusetts, embraced public schooling as a long-run attempt to cut white illiteracy while others, like Arkansas, did not (and some states during this time period arguably tolerated white illiteracy). If the use of public schooling (and the development of public taxation and concomitant rise in legitimacy of governance required to support the acceptance of taxation) was not universally applied to the issue of white illiteracy, then we should not expect white illiteracy per se to impact pro-regulatory behavior by state governments.

A last issue concerns the degree to which the existence of public schooling corresponds with the emergence of other forms of infrastructure. One of the variables I used in my analysis of state telegraph regulation policy adoption was estimated railroad mileage reported for states as of 1840, 1850, and 1860. It is possible that the existence of a larger public school infrastructure relates positively with greater embrace of the nascent railroad industry. In table 3, I employ various regression models (model 1 is simple ordinary least squares regression with state-clustered standard errors; model 2 is state fixed-effects with state-clustered standard errors; model 3 is state fixed-effects and year fixed-effects with state-clustered standard errors; and model 4 is state random effects) to assess whether a state's number of public schools impact its amount of railroad mileage.

<TABLE 3 ABOUT HERE>

In table 3, one sees mixed evidence that the number of schools corresponds with degree of railroad infrastructure, as the number of public schools is significant and positive with respect to railroad mileage in two of the four models (specifically, simple ordinary least squares with state-clustered standard errors and state random effects). Even in the model specifications where

the public schools variable is not significant (these specifications utilize state fixed effects as well as state fixed effects and year fixed effects), the relationship between the number of public schools and railroad mileage is consistently positive. One should admittedly exercise caution in putting excessive faith in the fixed effects specifications since both the independent (number of public schools) and dependent (railroad mileage) variables are slow-moving and change value only at decennial breaks in time. However, the consistently positive relationship suggests a possibility that embrace of public schooling leads to greater embrace of new technologies (in this case, the railroad) that will eventually require regulation to structure the relationship between entities supplying the technology (railroad operators) and entities using it (the public).

One assumption in the railroad analysis is that states with greater railroad mileage have greater railroad regulation. This assumption is not tested, and future empirical treatment on this issue should identify the full set of railroad regulations that were adopted by the states in the 1840-1860 period (I assume that centralization of resources during the Civil War makes the Civil War era and post-Civil War era incomparable to the Antebellum period), transform adoption data using the pooled event history technique advanced here, and investigate whether a state's number of public schools influences a state's adoption of railroad regulations. This would expand upon the findings of this paper and offer evidence as to whether the growth of public schooling served as a linchpin for the emergence of the regulatory state.

Conclusion

In this paper, I substantially expand upon the important work of Nonnenmacher (2001) and utilize pooled event history analysis along with a number of model specifications to determine the possible drivers of state telegraph regulation policy adoption. I find that the passage of time predicted telegraph regulation adoption (suggesting that temporal cascades of

policy adoption are not merely twentieth and twenty-first century phenomena) and find important and preliminary evidence suggesting that a state's embrace of public schooling may have engendered the rise of pro-regulatory climate by legitimizing the use of government policymaking power to work toward conceptualizations of the public good. Future research should utilize the full scope of state regulatory policy activity in the nineteenth century along with more granular measures of the rise of public schooling (if they exist) to ascertain how public schooling impacted regulation. Likewise, contemporary observers of state deprofessionalization may do well to analyze whether increased support for deprofessionalization is tied to changing attitudes about the legitimacy of public schooling and public taxation.

Table 1: Telegraph Regulation Policy Adoption across the U.S. States

State	Regulation Policy	Adoption Year
Alabama	Protect Installation	1848
	Establish Right-of-Way	1848
	Penalty for Message Disclosure	1848
	Establish Message Acceptance Rules	1848
Arkansas	Protect Installation	1859
	Establish Right-of-Way	1859
California	Protect Installation	1850
	Establish Right-of-Way	1850
	Penalty for Message Disclosure	1850
	Establish Message Acceptance Rules	1850
	Establish Message Sending Order	1850
Connecticut	Protect Installation	1846
	Establish Right-of-Way	1848
	Establish Message Acceptance Rules	1848
	Establish Message Sending Order	1848
Delaware	Protect Installation	1852
Georgia	Protect Installation	1847
	Establish Right-of-Way	1847
	Penalty for Message Disclosure	1852
	Establish Message Acceptance Rules	1852
	Establish Message Sending Order	1852
Florida	Protect Installation	1855
	Establish Right-of-Way	1855
	Establish Message Acceptance Rules	1856
Illinois	Protect Installation	1849
	Establish Right-of-Way	1849
	Penalty for Message Disclosure	1849
	Establish Message Acceptance Rules	1849
	Establish Message Sending Order	1849
Indiana	Protect Installation	1848
	Establish Right-of-Way	1848
	Penalty for Message Disclosure	1852
	Establish Message Acceptance Rules	1852
	Establish Message Sending Order	1852
Iowa	Establish Right-of-Way	1860
	Penalty for Message Disclosure	1860
	Establish Message Acceptance Rules	1860
Kentucky	Protect Installation	1848
	Establish Right-of-Way	1848
	Penalty for Message Disclosure	1848
	Establish Message Acceptance Rules	1848
	Establish Message Sending Order	1848
Louisiana	Protect Installation	1848

	Establish Right-of-Way	1848
	Penalty for Message Disclosure	1848
	Establish Message Acceptance Rules	1848
	Establish Message Sending Order	1848
Maine	Establish Right-of-Way	1848
	Penalty for Message Disclosure	1848
Maryland	Protect Installation	1847
	Establish Right-of-Way	1847
	Penalty for Message Disclosure	1852
	Establish Message Acceptance Rules	1852
	Establish Message Sending Order	1852
Massachusetts	Protect Installation	1846
	Establish Right-of-Way	1849
	Establish Message Acceptance Rules	1849
Michigan	Protect Installation	1847
	Establish Right-of-Way	1847
	Penalty for Message Disclosure	1851
	Establish Message Acceptance Rules	1851
	Establish Message Sending Order	1847
Minnesota	Protect Installation	1859
	Establish Right-of-Way	1859
	Penalty for Message Disclosure	1859
Mississippi	Protect Installation	1848
	Establish Right-of-Way	1848
Missouri	Protect Installation	1851
	Establish Right-of-Way	1851
	Penalty for Message Disclosure	1851
	Establish Message Acceptance Rules	1851
	Establish Message Sending Order	1851
New Hampshire	Protect Installation	1846
	Establish Right-of-Way	1849
	Establish Message Acceptance Rules	1854
	Establish Message Sending Order	1854
New Jersey	Protect Installation	1845
	Establish Right-of-Way	1845
	Penalty for Message Disclosure	1855
New York	Protect Installation	1845
	Establish Right-of-Way	1848
	Penalty for Message Disclosure	1850
	Establish Message Acceptance Rules	1848
	Establish Message Sending Order	1848
North Carolina	Protect Installation	1847
	Establish Right-of-Way	1847
Ohio	Protect Installation	1849
	Establish Right-of-Way	1849
	Establish Message Acceptance Rules	1851

	Establish Message Sending Order	1851
Pennsylvania	Protect Installation	1847
	Establish Right-of-Way	1847
	Penalty for Message Disclosure	1851
	Establish Message Acceptance Rules	1849
	Establish Message Sending Order	1849
Rhode Island	Protect Installation	1847
	Establish Right-of-Way	1847
South Carolina	Protect Installation	1854
	Establish Right-of-Way	1854
Tennessee	Protect Installation	1847
	Establish Right-of-Way	1847
	Penalty for Message Disclosure	1858
	Establish Message Acceptance Rules	1858
	Establish Message Sending Order	1858
Texas	Penalty for Message Disclosure	1860
	Establish Message Acceptance Rules	1854
	Establish Message Sending Order	1860
Vermont	Protect Installation	1847
	Establish Right-of-Way	1847
Virginia	Protect Installation	1847
	Establish Right-of-Way	1847
	Penalty for Message Disclosure	1847
	Establish Message Acceptance Rules	1852
	Establish Message Sending Order	1852
Wisconsin	Establish Right-of-Way	1856
	Penalty for Message Disclosure	1851
	Establish Message Sending Order	1858

Table 2: Determinants of State Telegraph Regulation Adoption

Variable/Model	(1)	(2)	(3)	(4)
Year	0.426***	0.708***	6.331***	0.588***
	(0.144)	(0.210)	(2.204)	(0.124)
Quadratic Year	-0.014	0.044**	0.259***	0.030**
	(0.009)	(0.021)	(0.068)	(0.014)
Cubic Year	-0.007**	-0.010***	-0.021**	-0.010***
	(0.003)	(0.003)	(0.009)	(0.002)
Fraction of Neighbors	-1.034	4.841***	-1.677	3.338***
	(0.838)	(1.387)	(1.798)	(0.874)
Population Density	0.011**	-0.073	-0.110	-0.012
	(0.005)	(0.074)	(0.073)	(0.018)
Railroad Mileage	0.001	0.002	0.003	0.001
	(0.000)	(0.002)	(0.002)	(0.001)
Public Schools	0.0002***	0.001**	0.002***	0.0005**
	(0.0000)	(0.0005)	(0.0007)	(0.0002)
Democratic Governor	0.023	-0.623	-1.964	-0.432
	(0.408)	(0.724)	(1.249)	(0.461)
Democratic House Percentage	-0.002	-0.006	0.003	-0.003
	(0.013)	(0.022)	(0.019)	(0.016)
Democratic Senate Percentage	0.006	0.005	0.038	0.002
	(0.013)	(0.017)	(0.030)	(0.014)
Prior Adoption	-5.536***	-18.569***	-33.769***	-12.955***
	(1.322)	(5.130)	(8.442)	(2.043)
Slave Population	$3.56*10^{-6**}$	$4.98*10^{-6}$	-0.00002	$1.83*10^{-6}$
	$(1.68*10^{-6})$	$(7.86*10^{-6})$	(0.00001)	$(4.72*10^{-6})$
Higher Education Institutions	0.003	-0.399	-0.341*	-0.082
	(0.035)	(0.263)	(0.176)	(0.094)
White Adult Illiteracy	$-1.44*10^{-6}$	0.0001	0.00005	0.00002
	(0.00001)	(0.0001)	(0.00009)	(0.00002)
Observations	996	984	887	996
Model Description	Logistic/State Clustered Errors	Logistic/State FE/State Clustered Errors	Logistic/State FE/Year FE/State Clustered Errors	Logistic/State RE

***critical value = 0.01; **critical value = 0.05; *critical value = 0.10

Figure 1: How Number of Public Schools Influence Telegraph Regulation Policy Adoption

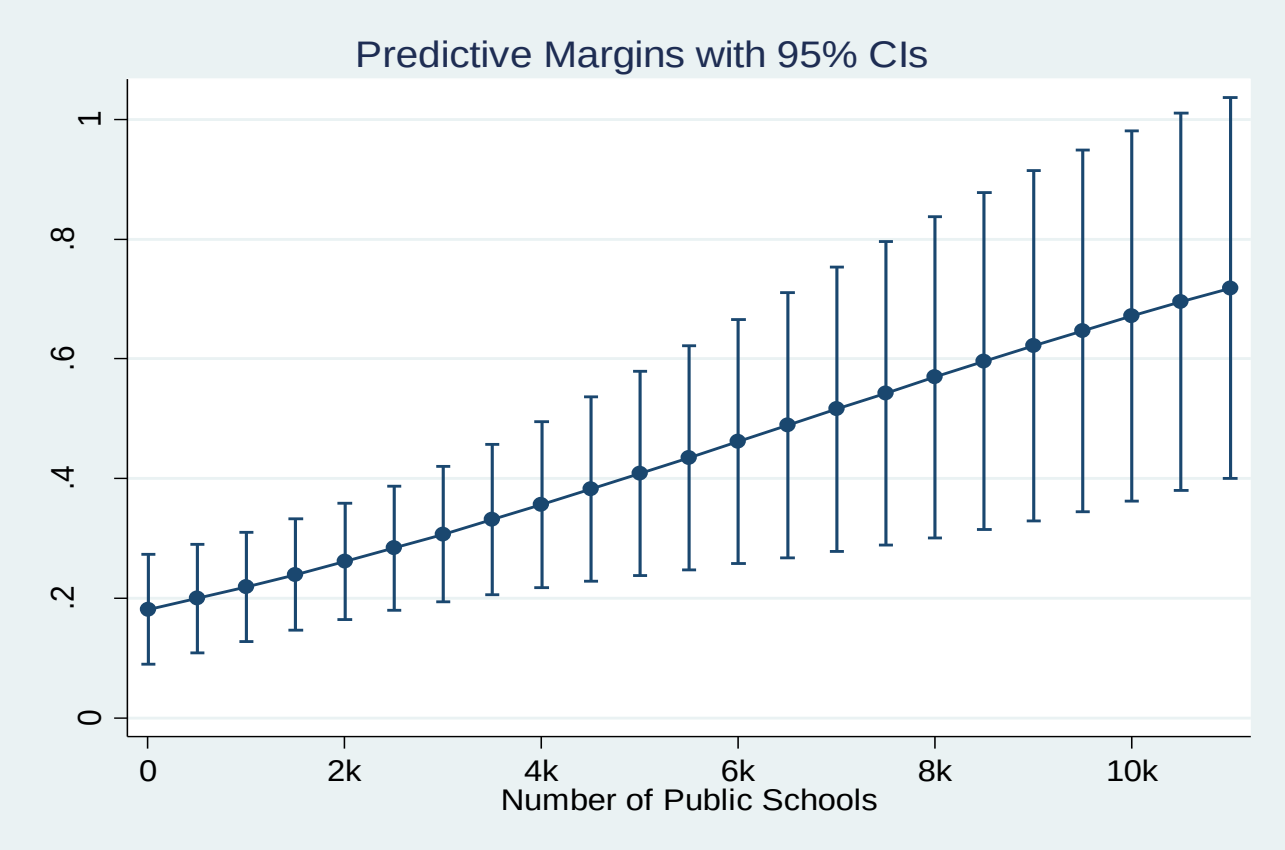

Table 3: Number of Public Schools on Railroad Mileage

Variable/Model	(1)	(2)	(3)	(4)
Year	15.723***	4.735	0.002	7.939***
	(4.178)	(4.526)	(0.003)	(1.322)
Population Density	2.048	7.373	3.998	5.103***
	(1.391)	(5.388)	(5.242)	(0.589)
Public Schools	0.060***	0.034	0.028	0.032***
	(0.016)	(0.046)	(0.039)	(0.008)
Democratic Governor	51.768***	9.456	21.247	12.439
	(28.499)	(24.454)	(17.946)	(12.180)
Democratic House Percentage	-0.511	-0.254	-0.392	-0.448
	(1.087)	(0.599)	(0.692)	(0.410)
Democratic Senate Percentage	-0.838	-0.477	-0.626	-0.095
	(1.190)	(1.063)	(0.897)	(0.420)
Slave Population	0.0003	-0.0001	-0.0005	-0.0001
	(0.0002)	(0.0009)	(0.001)	(0.0001)
Higher Education Institutions	3.849	33.238	23.876	29.250***
	(6.171)	(23.607)	(22.384)	(2.835)
White Adult Illiteracy	-0.001	0.0007	0.003	0.001
	(0.001)	(0.007)	(0.007)	(0.001)
Observations	996	996	996	996
Model Description	State Clustered Errors	State FE/State Clustered Errors	State FE/Year FE/State Clustered Errors	State RE

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