# Entrepreneurship and Regulatory Voids: The Case of Ridesharing

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**Abstract.** Formal institutions, e.g., regulations, are considered crucial determinants of entrepreneurship, but what enables regulatory change when there is a regulatory void, meaning entrepreneurship clashes with existing regulations? Drawing on public choice theory, we hypothesize that regulatory freedom facilitates the introduction of legislation to fill such voids. We test this hypothesis using unique data documenting the time for *ridesharing* to become legalized at the state level across the United States following its local (and often illegal) rollout. Results suggest states with greater regulatory freedom passed ridesharing legislation quicker, highlighting an underappreciated way that extant regulatory freedom facilitates the accommodation of entrepreneurship.

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# 1. Introduction

Entrepreneurs play a crucial role in economic growth largely because they introduce innovations, notably new products and services, into the economy (Schumpeter, 1934; Wennekers & Thurik, 1999). The adoption of certain (formal and informal) institutions—the rules of society's economic game (North, 1990)—is generally thought to precede productive entrepreneurial behaviors since "institutions are what enable the right type of entrepreneurship to take place" (Minniti & Lévesque, 2008, p. 608; cf. Baumol, 1990). However, what happens when existing rules and regulations turn out to be ill-suited for novel forms of entrepreneurship? The fact is that the law often lags technology because it cannot adapt at the same speed (Fenwick et al., 2016). Researchers describe such situations as *regulatory voids* (e.g., Khanna & Palepu, 2010; Gurses & Ozcan, 2015)*,* implying that unless they are filled, these voids can be detrimental to individual entrepreneurs struggling to achieve legitimacy *and* compromise society's ability to reap the benefits from innovation (Sundararajan, 2016; Thierer, 2016). Yet, while it is well-known that regulatory capture by market incumbents often prevents the kind of regulatory change necessary for innovations to develop properly (Nelson, 1994; Carpenter & Moss, 2013), few studies have systematically examined what features of a polity's extant institutional system make it possible, despite this, to introduce legislation accommodating an innovative service or product while clarifying rules and reducing uncertainty.

The purpose of this article is to remedy this research gap, determining how and when regulatory voids surrounding new forms of entrepreneurship can be filled. This issue is of considerable importance for the entrepreneurship literature, given i) the established importance of institutions and regulations for society to reap the benefits of entrepreneurship (Bjørnskov & Foss, 2013), and ii) the recognition that market actors can engage in institutional entrepreneurship to affect institutional change (Bruton et al. 2010). We use public choice theory to hypothesize that the extent to which a society's existing institutional setup already reflects *regulatory freedom* (a subset of economic freedom) is a crucial determinant of its ability to fill regulatory voids surrounding entrepreneurship. We test our hypotheses using a new dataset detailing the time it took for *ridesharing* to become legalized at the state level across the United States following its local rollout.

Ridesharing is potentially an important form of high-impact entrepreneurship (Acs, 2010), and a prominent example of the type of platform-based sharing economy business model that has transformed the modern business landscape, largely by using digital technologies

(Sundararajan, 2016; Mair & Reischauer, 2017). The service connects drivers with individuals requesting a ride by way of a smartphone application. Uber, the world's largest ridesharing company, was valued at over US$80 billion at IPO and competes with several copycats across the globe (New York Times, 2019), but many American locales initially prohibited ridesharing because preexisting taxi regulations were ill-equipped to deal with this new service. Enforced at the municipal level, such laws usually barred ridesharing firms from entering local transportation markets, meaning the companies that did so anyway initially (and consciously) operated illegally (Edelman, 2017; Garud et al., 2020). Thus, the advent of ridesharing offers a prime example of the kind of regulatory void that occurs when an entrepreneurial service is too different to conform to a polity's existing laws and regulations. Studying ridesharing in the United States helps shed light on the general question of under what conditions such voids can be filled and how existing institutions and institutional entrepreneurs affect this process.

Economic freedom has as its cornerstones "personal choice, voluntary exchange, freedom to enter markets and compete, and security of the person and privately owned property" (Gwartney et al., 2021, p. *v*). Regulatory freedom is an important component of the larger economic freedom, since "(e)conomic freedom is reduced when taxes, government expenditures, and regulations are substituted for personal choice, voluntary exchange, and market coordination" (Gwartney et al., 2021, p. 2). While many empirical studies document the importance of economic freedom, including regulatory freedom, for entrepreneurship and innovation (e.g., Bjørnskov & Foss, 2008; Gohmann et al., 2013; Zhu & Zhu, 2017; Lucas & Boudreaux, 2020), they usually examine a direct effect whereby a polity's extant regulations hinder or constrain entrepreneurship. Public choice theory enables us to hypothesize a second, less direct effect: largely because regulators are less likely to be beholden to regulatory capture (Tullock, 1975), greater regulatory freedom should make it easier to introduce new regulations that establish clear rules of the game and remove uncertainty for new products or services. This is an underappreciated way in which regulatory freedom affects entrepreneurship.

Most state governments eventually did fill the regulatory void surrounding ridesharing following its local launch in the state, introducing state-wide legislation similar enough to permit comparisons across states. Yet, while some states acted quickly to legalize ridesharing, most took years. In our view, the time taken to legalize ridesharing is a useful proxy for the difficulty of filling this regulatory void. To measure this variable, we draw on publicly available data from ridesharing company newsrooms, media articles, and legal documents to create a unique dataset detailing the dates when ridesharing launched locally in a state for the first time and when that state passed legislation allowing ridesharing to operate. As our main

independent variables of interest, we proxy for regulatory freedom by employing the highly detailed regulatory subcomponent of the state-specific version of the economic freedom index, *Freedom in the 50 States* (Ruger & Sorens, 2021). We also include other state-level variables with potential bearing on the time it takes to enact statewide ridesharing legislation, notably political contributions from ridesharing firms and the taxi industry, the order of ridesharing rollout, and the urbanization rate.

To test the proposed relationships, we employ cross-sectional OLS and Cox hazard analysis, and a stratified extension of the Cox model, the Prentice, Williams, and Petersen gap time model (henceforth PWP-GT). Previously unused in the entrepreneurship literature, PWP-GT enables us to separate (the first event of) ridesharing rollout in a state from (the second event of) ridesharing legislation. Cross-sectional results support our hypothesis that regulatory freedom facilitates the filling of regulatory voids. A one-standard deviation increase in regulatory freedom is associated with a 192-day decrease in the time until legislation. Results from the PWP-GT model corroborate these results, associating higher regulatory freedom with greater monthly likelihood that legislation will be passed. No additional covariates are consistently significant across models.

This article contributes to our understanding of the relationship between formal institutions and entrepreneurship by hypothesizing and systematically examining the conditions under which regulatory voids are filled, hinting at an important yet underappreciated role for a polity's extant institutional setup in facilitating entrepreneurship. By focusing on a developed economy, we also contribute to an institutional void literature that is usually centered on emerging contexts. We also demonstrate the value of public choice theory to understand the institutional context of the void-filling process. Filling regulatory voids is a crucial function of a flexible institutional system, meaning polities characterized with low regulatory freedom will be at a disadvantage for reaping the benefits of innovation. The paper suggests new ways to understand the institutional context of entrepreneurial newcomers' regulatory battles, contributing to the discussion on institutional dynamics and institutional entrepreneurship, and what is necessary for profit-driven entrepreneurs to affect institutional change. We also make an empirical contribution by employing a stratified Cox model extension, which should be useful to entrepreneurship researchers considering the effect of the same set of covariates on related yet distinct events.

## 2. Theory and Hypothesis Development

### *2.1 Regulatory voids*

Formal institutions are critical for entrepreneurship because they can reduce the uncertainty associated with the entrepreneurial activity, enabling entrepreneurs to allocate resources to more productive uses (Baumol, 1990; Bjørnskov & Foss, 2013). This seems especially to be the case for institutions reflecting economic freedom (Berggren, 2003; Gwartney et al., 2021): Using various economic freedom indices including regulations as important subcomponents, researchers have generally found that polities with more economic freedom exhibit higher rates of entrepreneurship, innovation, and economic growth (e.g., McMullen et al., 2008; Sobel, 2008; Hall & Lawson, 2014; Zhu & Zhu, 2017). Yet, the freedom-entrepreneurship relationship seems to vary by context (e.g., Gohmann et al., 2008, 2013; Estrin et al., 2013; Audretsch et al., 2019), likely because institutions and regulations can be heterogeneous in their effects (Lucas & Boudreaux, 2020).

Notably, managing social costs using regulations often seems to come at the expense of entrepreneurial activity; thus, regulation can be labeled a double-edged sword (Friske & Zachary, 2019). While cross-country evidence suggests, e.g., that excessive entry regulations deter entrepreneurship (e.g., Djankov et al. 2002; Klapper et al. 2006), research in this vein also indicates that, overall, "a functional regulatory environment incentivizes entrepreneurs" (Audretsch et al., 2019, p. 1150; see also Estrin et al., 2013), though there seems to be "a delicate balance between providing an institutional environment that is conducive to entry and growth, and passing the point where overregulation curbs the potentially large welfare effects related to entrepreneurship and growing firms" (Braunerhjelm et al., 2015, p. 5).

Thus, new forms of entrepreneurship likely necessitate *some* regulation, and even economically free contexts may require continual regulatory adaptation to safeguard people's expectations while accommodating the novelty inherent in entrepreneurship (Mokyr, 1992; Thierer, 2020). Institutional scholars stress that as circumstances change, an institutional structure might become sub-optimal without "a coordinating device, such as legislation or the appearance of a 'political entrepreneur', to engineer a change in the rules" (Kingston & Caballero, 2009, p. 165). A key implication is that "institutions may constrain or enable entrepreneurial action, but they do not *determine* them. There is still room for design—both in designing institutions as a matter of social welfare and in individual entrepreneurs and their

stakeholders designing institutions as a matter of *self-interested* entrepreneurial action" (Pacheco et al., 2010, p. 1004).

Emerging markets are replete with formal institutional voids, lacking laws and regulations that facilitate various types of market transactions (Khanna & Palepu, 2010). Actors attempt to fill these voids, e.g., by using informal institutional arrangements (Webb et al., 2020) such as reputation (Gao et al., 2017) and business networks (Khanna & Palepu 2010) or by engaging in entrepreneurship of a social or an institutional nature (Zahra et al., 2009; Mair & Marti, 2009). Institutional entrepreneurship can be described as "the activities of actors who have an interest in encouraging particular institutional arrangements and who leverage resources to create new institutions or to transform existing ones" (Bruton et al., 2010, p. 429; see also Hardy & Maguire, 2008). According to Li et al. (2006, p. 358), institutional entrepreneurs in emerging markets do not "only play the role of traditional entrepreneurs in the Schumpeterian sense, but also help establish market institutions in the process of their business activities."

While the void literature has mainly focused on emerging market contexts (Gao et al., 2017), institutional voids are also present in "developed" markets like the United States, where they usually emerge because technological advances outpace changes in regulatory frameworks (Webb et al., 2020). An example is the attempt to launch pay-tv in the strictly regulated US broadcasting industry, as studied by Gurses & Ozcan (2015), who use the term "regulatory void," a term we also find apt. Thus, a regulatory void usually occurs when a new product or service is too different to conform to a polity's existing laws and regulations. The US biotech sector and the life insurance industry faced historical examples of regulatory voids (Zelizer, 1978), while online genetic analysis, bitcoin, 3-D printing, advanced medical devices, and the sharing economy face modern variations of the same phenomenon (Thierer, 2016).

Institutional entrepreneurship permeates the issue of regulatory voids, from their emergence until the time they are filled (if they are filled). First, whether regulatory voids are discovered or created is a matter of perspective: Entrepreneurs are strategic, and when it benefits them, they can intentionally rebel against traditional structures and rules (Thierer, 2020). Sometimes, they enter markets even though they know their operations violate existing regulations, e.g., to gain visibility and jump-start network effects (Garud et al., 2020). Such evasive efforts can be described as an indirect form of institutional entrepreneurship (Li et al. 2006, p. 359) that changes the de facto effect of regulations (Elert & Henrekson, 2016, p. 101). Subsequently, these efforts may also (intentionally or unintentionally) prompt a legislative response that results in formal changes in the regulatory environment (Hwang & Powell, 2005;

Elert & Henrekson, 2017). However, such a strategy is likely to be fraught with "conflicts, tensions, and contestation" as the venture must struggle for cognitive legitimacy in the market and sociopolitical legitimacy vis-à-vis regulators (Garud et al., 2020, p. 4; see also Mair & Reischauer, 2017). That said, non-evading entrants also face considerable challenges, e.g., in choosing whether to compete or cooperate with incumbent firms (see, e.g., Ansari et al., 2016) and in how to deal with incumbent resistance when entrants' technologies are seen as socially beneficial (Zietsma et al. 2018).

When firms operating in a void actively try to influence the legislative outcome in order "to improve the environment and to create structures that help their business to be recognized and promoted" (Bruton et al., 2010, p. 428), they are engaged in a more direct form of institutional entrepreneurship. They rationalize this process by discrediting the status quo and presenting "the alternative practices they are championing as necessary, valid and appropriate" (Hardy & Maguire, 2008, p. 208). However, similar efforts are undertaken by firms with an interest in maintaining the status quo – e.g., incumbents in traditional sectors –either by opposing regulatory change altogether or by promoting changes that make it impossible for the newcomers to remain in operation. The dynamics of these struggles (discussed in more detail in Section 2.3) arguably hinge on an industry's level of regulation and the overall level of regulation in the economy. Generally, polities characterized by overregulation will be less flexible and more vulnerable to extant special interests, meaning regulatory voids will take longer to be filled, if they are allowed to be filled at all.

It is difficult to overstate the long-term consequences of these regulatory struggles. As most new technologies appear to require "a defined institutional, including regulatory, space" to govern production, distribution, and consumption (Gurses & Ozcan, 2015, p. 1712), failing to fill a regulatory void surrounding a new technology—as has been the case in many locales with driverless cars (Downes, 2016)—will likely cause the industry to suffer a considerable amount of uncertainty (Anderson & Tushman, 1990; Hargadon & Douglas, 2001). Because entrepreneurship is productive or non-productive relative to the institutional context in which it takes place (Lucas & Fuller, 2017), persistent voids risk hampering long-term innovation and economic progress (Webb et al., 2020).

The advent of ridesharing offers a prime example of the kind of regulatory void that occurs when entrepreneurship does not conform to a polity's existing laws and regulations. Studying ridesharing in the United States helps shed light on the general question of under what conditions such voids can be filled. As we shall see, while ridesharing generally clashed

with local regulations following rollout, the void surrounding ridesharing primarily seems to have been filled by legislation introduced at the state-level.

*2.2 Ridesharing and the regulatory void*

Studies suggest that ridesharing provides societal benefits such as increases in consumer surplus (Cohen et al., 2016), efficiency (Cachon et al., 2017), and less low-quality entrepreneurial activity (Burtch et al., 2018), but there is also evidence of detrimental effects like increased congestion and more accidents (Barrios et al., 2020), and privacy threats (Cheng et al., 2021). Thus, judgments concerning the benefits of ridesharing depend on the considered outcome *and* on the context where it takes place. In fact, authors speculate that both the benefits and the costs of this type of entrepreneurship largely depends on the institutional and regulatory framework that is established to govern it (Choe et al., 2020; see also Lucas & Fuller, 2017). Yet, when ridesharing rolled out in local markets across the United States, it often clashed with extant regulations (Koopman et al., 2015; Davidson & Infranca, 2016), thus facing considerable (cognitive and sociopolitical) legitimacy challenges (Garud et al. 2020). These facts can be explained by several organizational and technological features characterizing ridesharing.

First, ridesharing firms enabled customers to hail rides via smartphone applications, essentially providing the same service as traditional taxis through different means (Sundararajan, 2016). Second, instead of the preset prices and quantities of normal taxis, ridesharing firms charged prices based on supply and demand, a pay flexibility enabling them to adjust labor costs, particularly wages, to changing market conditions (Hahn & Metcalfe, 2017, p. 2). Add to this the concerns various parties have raised regarding labor contracts, discrimination, and privacy (Davidsson & Infranca, 2016), and it becomes easy to see why the existing regulatory landscapes governing pre-ridesharing transportation markets often were ill-equipped to reap the benefits of, and handle the challenges from, ridesharing.

The relevance of regulatory policy for American transportation markets is evident; usually the domain of local or urban jurisdictions, these markets are typically heavily regulated with licensing systems that create high entry barriers. Indeed, regulatory capture is considered common in local transportation markets, with regulations serving the interests of established taxi firms rather than the interests of consumers and newcomers, protecting them from competition (Farren et al., 2016; see also Tullock, 1975). Many cities had franchise requirements for taxi companies (Schaller, 2007), and taxi medallions giving rights to operate

have been sold for more than a million dollars on the secondary market in big cities (Agovino, 2017), indicative of the large rents earned by those with access.

Ridesharing firms were able to enter taxi markets despite these impediments (Barry & Caron, 2015) by engaging in permissionless innovation and consciously leverage local regulatory ambiguity (Elert & Henrekson, 2017; Thierer, 2020). Thus, Uber and its competitor Lyft initially framed themselves as technology companies, arguing that they should not be regulated like taxis even though they provided a transportation service (Garud et al. 2020, p. 10). Uber entered without waiting for permission or despite warnings from regulators in many cities, likely because it realized that regulatory compliance would compromise its business model's core value proposition of offering convenient rides through its smartphone app. This "intentional illegality" (Edelman, 2017) came with a cost of less sociopolitical legitimacy and a greater difficulty attracting necessary resources (Garud et al., 2020; see also Aldrich & Fiol, 1994). Still, seeking regulatory permission and complying with existing regulations could seriously have jeopardized the business model (cf., Fenwick et al., 2016). Put differently, these firms engaged in an evasive form of institutional entrepreneurship that changed the de facto effect of regulations (Elert & Henrekson, 2017).

The advent of ridesharing threatened incumbent taxi companies' rents, as attested, e.g., by the steep drop in taxi medallion prices in many markets (Choe et al., 2020). This likely prompted taxi companies to make local political contributions (e.g., Sandes, 2018) and engage in numerous lawsuits, sometimes followed by cease-and-desist orders for ridesharers from local regulators (Atlanta Journal-Constitution, 2014). The success of such efforts seems to have hinged on the extent of incumbents' regulatory capture (Garud et al., 2020; see also Carpenter & Moss, 2013). And, while local responses ranged from welcoming (usually because transportation options were limited, see, e.g., Torres, 2017) to hostile, ridesharing firms behaved differently in different regulatory contexts, sometimes abiding by and sometimes ignoring injunctions or cease-and-desist orders (Reuters, 2014; Portland Bureau of Transportation, 2014). Ridesharings' apparent benefits enabled ridesharing firms to co-opt key social groups and engage in direct forms of institutional entrepreneurship, e.g., petitioning or working with "regulators to enact favorable regulations and policies" (Garud et al., 2020, p. 21). Growing popularity and legitimacy meant the ridesharing companies could use their ridesharing platforms to mobilize the public against resistant officials, making it difficult to ban the service or enforce existing bans (Pollman & Berry, 2017). Their use of strategic framing to argue they favored the public interest also put regulators attempting to justify constraints in a potentially difficult position (Garud et al., 2020, p. 21). A dramatic example occurred in New

York City, when Uber, its drivers, its users, and the public pushed back against advocates of harsh ridesharing regulation. This "too big to ban" strategy was successful, as New York's governor "waded into the fight to say the state and not [NYC Mayor Bill] de Blasio should regulate Uber" (Jorgensen & Bredderman, 2016).

Finding a "solution" to the tug-of-war at the level of the state government is not exclusive to New York: Indeed, both newcomers and incumbents openly lobbied for statewide legislation to supersede municipal legislation (Associated Press, 2017; James, 2018). State-level political contribution data in the two years before and after ridesharing launched in the state reveal an uptick in political contributions following ridesharing rollout, especially from taxi companies, whose mean political contributions more than doubled (Figure A1 in the Appendix). Contribution dollars also correlate positively with urbanization rates, suggesting states with large cities received more contributions, likely because stakes were higher when demand was higher. Presently, all American states, except Oregon, have enacted ridesharing legislation. While they outline rules drivers must abide by, these regulations have generally been more lenient than the city ordinances they supersede (James, 2018). Moreover, many state ridesharing laws were based, in a stark example of interjurisdictional learning, on a model law inspired by Indiana's 2015 ridesharing law (developed by the National Conference of Insurance Legislators) (The Council of State Governments, 2016). This legislation includes permits from the state, rules for who can operate as a driver, and requirements of auto liability insurance purchased by the driver and/or the ridesharing company. The model law helps explain why variation in state ridesharing legislation appears limited (and thus similar enough to permit comparisons): As a concrete example, 38 out of 49 states require ridesharing drivers to hold the same minimum insurance coverage amount.

Still, the time between local ridesharing rollout and subsequent statewide legislation differed substantially across states, as seen in Figure 1. On average, 730 days passed between rollout and legislation passage, but whereas New York needed over 2,000 days, South Dakota did so 581 days *before* ridesharing became available. And, as large metropolitan areas were the first to experience rollout, states with smaller urban populations had time to develop their future response to ridesharing, e.g., by following the model law, which likely explains the strong, negative correlation between the order of ridesharing launch and the time from rollout until statewide legalization. Yet, state and local regulatory policy have loomed large over ridesharing's history from the outset; as we shall see, there are sound theoretical reasons to consider regulatory freedom as a key determinant of how fast states moved to fill the regulatory void surrounding ridesharing.

*Figure 1. Time between ridesharing rollout and enactment of statewide ridesharing legislation.*
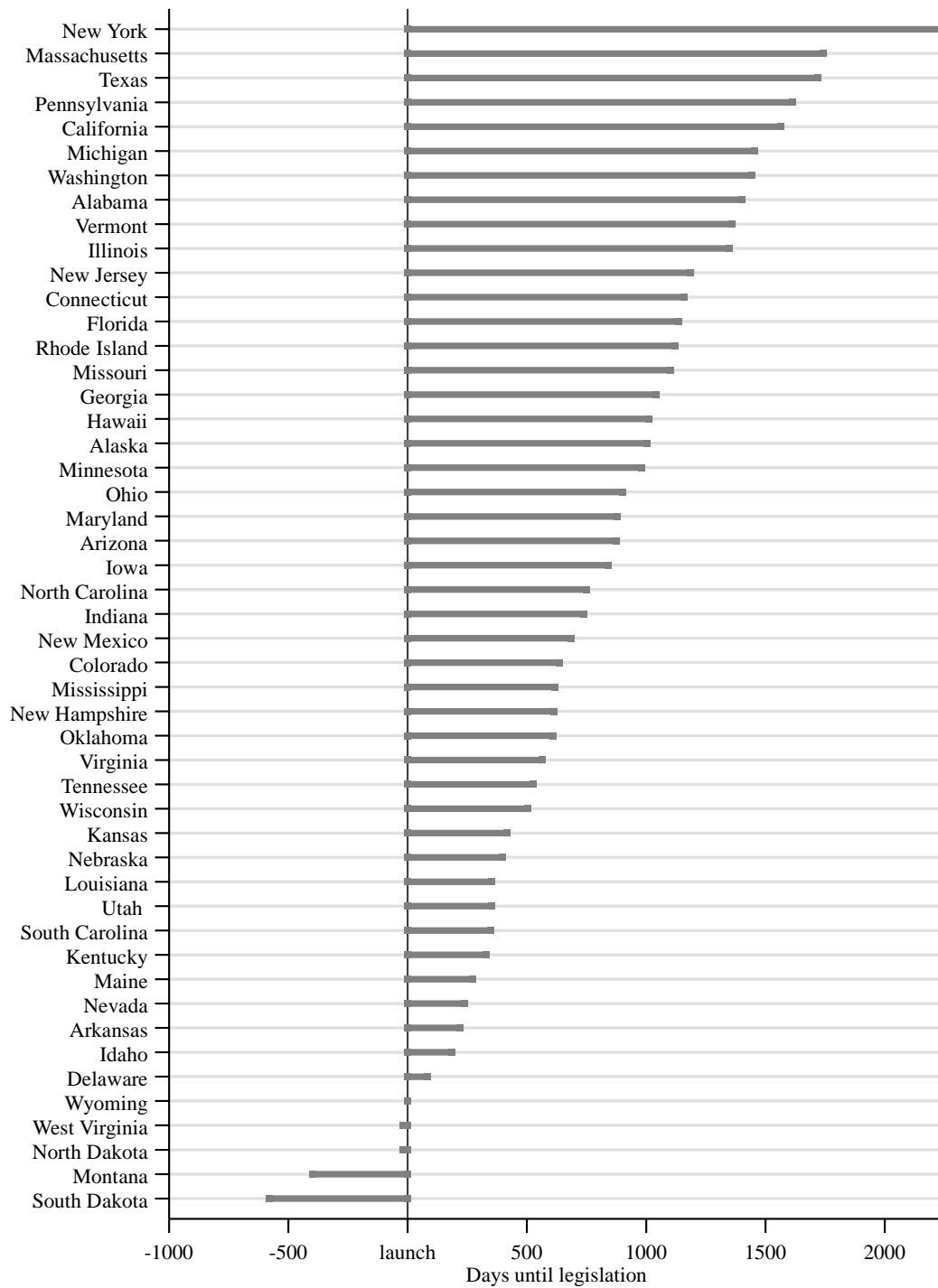
*2.3 Hypothesis development: Regulatory freedom and ridesharing legislation*

Whether entrepreneurship is beneficial or not depends in large part on the institutional setting in which it takes place and whether it enables a society to simultaneously reap the potential benefits of new entrepreneurship and limiting its potential downsides (Elert & Henrekson 2017; Choe et al., 2020). That governments fill regulatory voids by introducing regulation (Mair & Marti, 2009, p. 419) is perhaps self-evident from a public interest view of regulation, which posits that regulation benefits society, e.g., by encouraging innovation and reducing market uncertainty in the presence of competing technological standards (Pigou, 1932; Blind et al., 2017).

In contrast, a public choice view offers a clear role for institutional entrepreneurship by treating rules and regulations as objects of exchange on a market where politically connected (incumbent) market actors demand them while providing support to regulators or politicians (Stigler, 1971; Djankov et al., 2002; Blind et al., 2017). Importantly, incumbents will then fully capitalize on the gains from existing regulation and resist attempts at changing the status quo in what Tullock (1975) brands a transitional gains trap (explicitly citing the case of NYC taxi medallions as an example; see also Thomas, 2009).[1] Thus, in a market with low regulatory freedom, introducing new legislation that abolishes policies favoring rent-seeking firms may be difficult because the relative returns to productive activity have been reduced (Murphy et al., 1991; Gohmann et al., 2013). Conversely, where regulatory freedom is high, regulators and politicians will be more susceptible to new forms of entrepreneurship and more likely to enact regulation accommodating them.

Policies across government levels often overlap, and regulations at one level can either complement or offset regulations at another (Macey, 1990; Revesz, 2001), as demonstrated, e.g., by recent evidence that state- and city-level institutions and conditions alter the effects of national regulatory rules on local economic activity (Audretsch et al., 2019; Lucas & Boudreaux, 2020). As seen, local transportation markets in the US were generally highly regulated and captured pre-ridesharing, characterized by incumbent-friendly regulations putting newcomers at a disadvantage. Because the relative effectiveness of interest groups at different legislative levels matters greatly for regulatory outcomes (Revesz, 2001), ridesharing firms had much to gain by moving the legislative battle to the state level. Lobbying state

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[1] Though usually presented as competing (e.g., Audretsch et al., 2019; Lucas & Boudreaux, 2020), the public interest and public choice perspectives may be said to overlap during the regulation of new technologies when the definition of *what* serves the public interest is particularly open to interpretation (Gurses & Ozcan, 2015, p. 1730).

politicians opened the door for rule changes that would have been impossible at the captured local level. Meanwhile, incumbent firms were forced to focus their efforts where ridesharing firms focused theirs, although the fact that local legislation seldom deterred rideshares from local entry helps explains why incumbents sought state legislation. Still, this less captured arena put incumbents in a less advantageous position, as did ridesharing firms' effective mobilization of their users. The increased public support for ridesharing likely explains why state regulators, long content with letting cities regulate transportation markets, decided to step in, as they could now maximize political support by regulating an area that was previously seen as a local concern (for a general discussion, see Macey, 1990).

Yet, the state's overall regulation level arguably mattered for the enactment of ridesharing-friendly legislation for several reasons. First, incumbent taxi firms, having been present in the state for years, likely held sway over state politicians, too. After all, taxi firms did engage in state-level lobbying prior to ridesharing rollout (Figure A1), and generally, state-level politicians can obviously encourage certain firms at the expense of others, e.g., through marketing restrictions, tax credits, and other forms of regulatory exemptions (e.g., Friske & Zachary, 2019). Thus, state-level regulatory capture should have impeded the legislative efforts of ridesharing firms. Furthermore, in an analogy to the municipal level case, regulatory capture was likely stronger when state-level regulatory freedom was low because there was more regulations and thus more gains on which incumbents could capitalize (see Tullock, 1975; Thomas, 2009), e.g., environmental regulations or regulations related to the use of the court system (cf., Gohmann et al., 2008, p. 870), prompting them to maintain strong connections to key policymakers. Thus, by increasing the scope and possibility for incumbents to engage in regulatory capture, less state-level regulatory freedom should have made legislation legalizing ridesharing more difficult to achieve.

Second, but relatedly, regulatory complementarities suggest that regulations in different areas may reinforce each other's efficiency and increase the gains interest groups can make from rent-seeking (North, 1990; Hall & Soskice, 2001). As North (1990, p. 95) argues, "the interdependent web of an institutional matrix produces massive increasing returns" (cf. Pierson, 2004). A regulation's "embedding" in the overall institutional landscape helps explain why isolated reform attempts have been unsuccessful (Granovetter, 1985; Hall & Soskice, 2001). Thus, when highly regulated local taxi markets are embedded in a matrix of highly regulated state-level institutions, complementarities may be stronger, meaning there will be more resistance against reforming or altering the functioning of these markets (cf. North, 1990; Pierson, 2004). For example, fear of cascading effects may prompt firms in other sectors of the

economy facing their own sharing economy challengers to resist sharing economy-friendly legislation in related areas. Thus, less state-level regulatory freedom should make legislation legalizing ridesharing more difficult by increasing the likelihood that other interest groups will mobilize in favor of incumbents.

Low regulatory freedom may also result in a hard-to-navigate complexity (Boudreaux et al., 2019) for both entrepreneurial newcomers and reformers. When regulations are ubiquitous, there will also be a tendency to rely on more regulations to fix problems, rather than on market friendly reforms. Thus, low regulatory freedom may yield more regulations, in a regulatory spiral. It may also bias politicians and the public against reforms threatening that status quo (Ebbinghaus, 2009), making it more difficult for entrepreneurial newcomers such as ridesharing firms to sway public opinion and persuade institutional actors. Thus, while states with high regulatory freedom may perceive ridesharing legislation as unproblematic, it may be seen as a strong—and undesirable—break with the past when regulatory freedom is low.

That the difficulty of introducing new legislation can be captured by how much time it takes to do so, is evident from media accounts (e.g., Barrett, 2014) and scholarly articles on the productivity of legislative bodies (e.g., Alesina & Drazen, 1991). While our overall argument is that it should be relatively easier to fill regulatory voids surrounding new forms of entrepreneurship when regulatory freedom is high, for the case at hand, we state:

*Hypothesis: States with more regulatory freedom can more quickly pass legislation filling regulatory voids surrounding ridesharing than states with less regulatory freedom.*

We thus identify plausible theoretical reasons why regulatory freedom affects a polity's ability to fill regulatory voids surrounding new entrepreneurial forms. However, as our account (section 2.2) suggests, other factors potentially influence the filling of regulatory voids too, notably political contributions, the order of ridesharing rollout, and local demand. To test the hypothesized relationship, we now turn to a description of our empirical model.

## 3. Methods and Data Description

### 3.1. Research design

The ridesharing experience of American states presents us with a relevant empirical framework to test the hypothesis proposed in section 2. Specifically, we examine whether states with greater regulatory freedom fill regulatory voids surrounding ridesharing quicker, ceteris paribus. To do so, we use cross-sectional OLS, cross-section Cox hazard analysis, and a stratified extension of the Cox model, PWP-GT. This variety of models should put appropriate

scrutiny on the hypothesized relationship, making any consistent finding more reliable. Notably, PWP-GT enables us to separate (the first event of) ridesharing rollout in a state from (the second event of) ridesharing legislation. We use variables from publicly available datasets and a new dataset created specifically for this study. Moreover, we undertake several robustness checks using alternative models and proxies from other sources.

*3.2. Methodology*

Our first approach is a cross-sectional analysis including all American states that have passed statewide ridesharing legislation (all states except Oregon, n= 49). As we cannot reject normality of the variable denoting the time between rollout and legislation passage, we begin by using ordinary least squares:

$$Y_i = \alpha + \delta D_i + X_i \beta + u_i, \tag{1}$$

where the number of days between rollout and statewide legislation passage ($Y_i$) is dependent on regulatory freedom ($D_i$), a vector of state-specific variables ($X_i$), and an error term $u_i$. We expect the relationship between the dependent variable and regulatory freedom to be negative, indicating that states with greater regulatory freedom more quickly passed state legislation legalizing ridesharing, ceteris paribus.

We also employ Cox survival analysis, a hazard-based model suitable for duration data (Cox, 1972; Hensher & Mannering, 1994). A hazard function expresses the probability that an episode starting at time *t* is terminated within a given time interval, provided the event has not occurred before the beginning of the interval, i.e., at the time of rollout. Thus, we lose observations from the four states that enacted ridesharing legislation before rollout (n=45). The probability of passing such legislation after waiting for a duration Δt is represented by the hazard function. The Cox regression equation can be expressed as,

$$h_i(t) = h_0(t)exp(\delta D_i + X_i \beta) \tag{2}$$

where $h_i(t)$ is the hazard function for state $i$, $h_0(t)$ is the baseline hazard function, ($X_i$) is a vector of state-specific variables, and ($D_i$) is regulatory freedom. Results are presented using hazard ratios, and we expect the hazard ratio for regulatory freedom to be greater than 1 because it reveals the variable's contribution to increasing the probability of passing statewide ridesharing legislation.

Estimations of equation (1) and (2) offer an intuitive way to understand the hypothesized relationship but suffer from a small sample size and the risk of omitted variable bias. We therefore utilize the time-varying aspect of our data to construct a state-month time series, with each states' time-series beginning in the month that ridesharing first launched in the United

States, June of 2010, and ending in the month legislation passed in the state. We employ this monthly data in a stratified survival analysis, specifically the Prentice, Williams, and Peterson Gap Time model (PWP-GT), which can be considered an extension of the single-event Cox model used in Equation (2).

Described as a means to model recurrent events of a different nature (baseline intensity) (e.g. Prentice et al., 1981; Therneau & Grambsch, 2000), PWP-GT has, to our knowledge, yet to be used in the entrepreneurship literature. The model allows us to account for the fact that there are, in effect, two events in this study—the event of rollout and the event of legislation passage. Because the model is stratified by the event sequence (creating one stratum for each event so that the baseline hazard function can differ between the sequential events), we can use it to isolate the event we are interested in, meaning the rollout decision does not confound the legislation results (cf. Yang et al., 2017). Thus, we focus on how the explanatory variables, especially regulatory freedom, affect the time from rollout to legislation. Again, the hazard function expresses the probability that an episode starting at time *t* is terminated within a given time interval, provided the event has not occurred before the beginning of the interval, i.e., at the time of rollout, meaning only states that pass statewide ridesharing legislation *after* rollout are included. The probability is represented by the hazard function, expressed as:

$$h_{itj}(t) = h_{0j}(t)exp(\delta D_{it} + X_{it}\beta), \tag{3}$$

where $h_{itj}(t)$ is the hazard function for state $i$ at time $t$, in stratum $j$, $h_{0j}(t)$ the baseline hazard function in that stratum, $(X_{it})$ a vector of state-specific variables, and $(D_{it})$ regulatory freedom. Results are again presented using hazard ratios. We also present results showing how these variables affect the first event, rollout.

*3.3. Data and descriptive statistics*

Table 1 and Table 2 shows descriptive statistics for all variables included in estimations of equations (1)-(2) and equations (3), respectively (Tables A1 and A2 in the appendix show their correlations). Below, we describe how we gather and measure all variables.

**3.3.1. Dependent variables**

We compiled a proprietary dataset utilizing sources including legal documents (usually from state legislatures), media articles (often from local news sites), and publicly available information from ridesharing companies. The dataset spans observations from June 2010, when the first ridesharing firm Uber launched in San Francisco, until June 2018, when 49 of 50 states had enacted ridesharing legislation (Oregon still has not done so.). It includes the date a

ridesharing firm first launched locally in each American state (Uber was usually first, except in Florida, Missouri, and South Dakota where Lyft launched first.) and the date statewide ridesharing legislation was passed. All dates were double-checked by a research assistant.[2]

*Table 1: Descriptive Statistics for variables in Equations (1)-(2), unit of analysis: state*

| Variable | Obs | Mean | Std. Dev. | Min | Max |
|---|---|---|---|---|---|
| *Dependent variable* | | | | | |
| Days until legislation | 49 | 751.29 | 579.99 | -581 | 2248 |
| *Main independent variable* | | | | | |
| Regulatory freedom | 49 | 0.47 | 1.49 | -3.73 | 2.277 |
| *Additional independent variables* | | | | | |
| Order of rollout | 49 | 25.00 | 14.29 | 1 | 49 |
| Taxi contributions (000s) | 49 | 20.48 | 75.30 | 0.00 | 483.25 |
| Ridesharing contributions (000s) | 49 | 1.28 | 4.26 | 0.00 | 22.20 |
| Unknown contributions (000s) | 49 | 8.91 | 23.75 | 0.00 | 136.10 |
| Urbanization rate (000s) | 49 | 73.43 | 14.68 | 38.66 | 94.95 |

*Descriptive statistics for only states that saw legislation after rollout (n=45) in Equation (2) are available upon request.

*Table 2: Descriptive Statistics for variables in Equation (3), unit of analysis: state-month*

| Variable | Obs | Mean | Std. Dev. | Min | Max |
|---|---|---|---|---|---|
| *Dependent variable* | | | | | |
| Legislation passed (0/1) | 1,212 | 0.04 | 0.19 | 0 | 1 |
| *Main independent variable* | | | | | |
| Regulatory freedom | 1,212 | -1.43 | 1.47 | -4.68 | 0.71 |
| *Additional independent variables* | | | | | |
| Taxi contributions (000s) | 1,212 | 8273.77 | 26986.77 | 0.00 | 295466.30 |
| Ridesharing contributions (000s) | 1,212 | 645.64 | 2928.78 | 0.00 | 22700.00 |
| Unknown contributions (000s) | 1,212 | 8730.44 | 30288.40 | 0.00 | 401668.70 |
| Urbanization rate | 1,212 | 78.58 | 13.66 | 38.66 | 94.95 |

*Descriptive statistics for the PWP-GT first event (n=1,793) in Equation (3) are available upon request.

The first dependent variable, *Days until legislation*, captures the time from the first instance of local ridesharing rollout until statewide legislation legalizing ridesharing is passed, measured in days. It will be used in the estimations of Equations (1) and (2). The second dependent variable, *Legislation passed*, takes the form of a dummy variable taking the value 1 if

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[2] The Excel file, Ridesharing-Data, available as supplementary material, includes a) links to sources confirming when rollout occurred in the state and b) links to sources confirming when statewide ridesharing legislation was enacted. We used this data to construct the cross-sectional dataset (also n=49) used to estimate Equations (1) and (2) and the time-series dataset (n=1,793 in the first stage, n=1,212 in the second stage) for Equation (3).

legislation has been passed in a particular month, 0 otherwise. We use it in the PWP-GT model to capture the time between the rollout in a state and the event of legislation passage in that state, the occurrence of which is defined by stratification in Equation (3) (effects for the first event, i.e., the time until a state's rollout from the country's first ridesharing launch, are also reported). The dependent variables shed light on different facets of the hypothesized relationship.

### 3.3.2. Main independent variable

Many studies explaining differences in entrepreneurship across American states proxy for economic freedom using the Economic Freedom of North America (EFNA) index (Stansel et al., 2019) and its three subcomponents size of government, taxes, and labor market freedom (e.g., Sobel, 2008; Gohmann et al., 2008; Lucas & Boudreaux, 2020). Because the main query of this paper is the filling of regulatory voids, we instead consult the Cato Institute's *Freedom in the 50 States* economic freedom index (Ruger & Sorens, 2021), which estimates the economic freedom of each state based on several fiscal and regulatory policy measures. The regulatory policy score is particularly detailed, including seven major subcomponents (land use freedom, health insurance freedom, labor market freedom, lawsuit freedom, occupational freedom, miscellaneous regulatory freedom, and cable and telecommunications) that are given different weights in the overall regulatory freedom score and altogether composed of 50 different measures. As such, it should offer a comprehensive view of a state's regulatory freedom.

In our main specifications, we thus estimate separate regressions for all equations where the *regulatory freedom* component of the *Freedom in the 50 States* index serves as the main independent variable. For the cross-sectional analysis, we use the 2009 scores for this variable because this was the year before ridesharing was available in any state, whereas the PWP-GT analysis includes the annual scores for each state at the time of rollout through legalization. Moreover, because the underlying variables composing the state-level index are standardized to mean zero and unit standard deviation, with the freedom scores being the weighted sum of those standardized variables, we scale the index scores by 10 to facilitate the interpretation of the regression results.

### 3.3.3. Additional independent variables

The vectors $X_i$ and $X_{it}$ in the equations include other variables with a clear theoretical potential to affect our dependent variable. First, we may observe an interjurisdictional learning effect, in the sense that states with a later ridesharing launch were able to pass statewide ridesharing

legislation more quickly because they learned from the states that had experienced earlier launches. The model law described in section 3 points to this possibility. In the cross-sectional estimations, we control for this potential learning effect by using our own dataset to construct an *order of rollout* variable, ranking states according to the order in which they experienced rollout.

Second, while we theorize that regulatory freedom affects the relative rewards to incumbent rent-seeking activities, actors may also influence the legislative process more directly. We therefore include data on political contributions, collected from the *National Institute on Money in Politics* and measured in 1,000s of dollars (because only 18 states publish lobbying expenditures, we abstain from using this data) (National Institute on Money in Politics, 2018), classifying donors into three groups: *ridesharing contributions*, *taxi contributions*, and *unknown contributions* (from individuals and companies whose industry affiliation is unknown). We use the data from the first two years after ridesharing launched in each state in the cross-sectional models but allow the observations to change annually in the PWP-GT model. The data reveal that most contributions were in states that experienced early local ridesharing launch and that six states saw no contributions at all. Correlations between the contribution measures and the days until legislation (Tables A1 and A2) are near zero, suggesting contributions may be of limited importance.

Third, bigger cities offer large market opportunities despite possibly burdensome regulations (Audretsch et al., 2019). Hence, the size of local markets could potentially matter for legislation passage, by helping determine both the extent to which there are incumbents and the size of the economic pie these incumbents may wish to defend. Because ridesharing is a mostly urban phenomenon, we capture the size of the local market by including the *urbanization rate* of each state, taken from the United States Census Bureau's 2010 census (Census Bureau, 2011).

## 4. Results

### 4.1. Main results

Table 3 shows that results from estimating equation (1) using OLS and equation (2) using the Cox hazard model are consistent. In the OLS regression, regulatory freedom has a significant, negative relationship with the dependent variable, suggesting states with greater regulatory freedom experienced a shorter time lapse between ridesharing launch and statewide legalization than states with lower levels of regulatory freedom, ceteris paribus. Cox model

results associate a higher level of regulatory freedom with a greater probability that statewide legislation will occur following launch. As to the economic significance of the results, OLS results reveal that one-standard deviation increase in *regulatory freedom* is associated with a 192-day decrease in the time until legislation, or roughly a 26% decrease relative to the mean time of 751 days, while Cox result associate a one standard deviation increase with 51% greater probability that legislation will occur. These results support the hypothesis that states with higher regulatory freedom may be more prone to enact legislation to fill regulatory voids.

*Table 3. Results from estimating eq. (1) and (2). Dependent variable:* Days until legislation.

| | OLS: Coefficients | Cox model: Hazard Ratios |
|---|---|---|
| Regulatory freedom | -129.15*** | 1.51*** |
| | (42.56) | (0.22) |
| Order of rollout | -21.15*** | 1.04** |
| | (5.49) | (0.02) |
| Taxi contributions (000s) | -0.11 | 1.00 |
| | (0.95) | (0.00) |
| Ridesharing contributions (000s) | -9.02 | 1.03 |
| | (14.13) | (0.04) |
| Unknown contributions (000s) | -0.07 | 1.00 |
| | (2.87) | (0.01) |
| Urbanization rate | 3.08 | 1.00 |
| | (5.521) | (0.02) |
| Constant | 1129.24** | |
| | (498.96) | |
| Obs | 49 | 45 |
| R2 | 0.57 | |
| Adj R2 | 0.51 | |
| Log likelihood | | -116.759 |

Note: Standard errors within parentheses. ***, **, * denote significance at the 1, 5, and 10 % level.

Results for the remainder of the explanatory variables are insignificant, with the exception of *order of rollout*, which seems to affect the passing of legislation: OLS coefficients suggest that the (n+1)th state to see rollout will need about 21 days less to pass ridesharing legislation than the nth state, possibly by learning from earlier states. Meanwhile, *taxi contributions*, *ridesharing contributions*, or *unknown contributions* are all insignificant, suggesting that if political contributions matter, this is captured by the regulatory variable. Finally, the urbanization rate is insignificant, suggesting that a greater local market mattered little for the passing of statewide ridesharing legislation.

We now turn to the PWP-GT estimation of equation (3), which, as mentioned, examines the effects of the covariates on two events, defined by stratification: i) origin to rollout, i.e., the time between the first launch of ridesharing in the country and a state's rollout and ii) rollout to legislation, i.e., the time between each state's rollout and legislation. These results are also presented as hazard ratios, so a ratio of greater (less) than 1 indicates a variable increases (decreases) the likelihood of the event occurring. Table 5 shows that for the first event (time until rollout), the hazard ratio for urbanization rate is highly significant and greater than one, indicating that local demand is what mattered most for the rollout decision. Together with the fact that the hazard ratio for regulatory policy is weakly significant and less than one here, this suggests that states with high levels of urbanization and low levels of regulatory freedom actually experienced rollout sooner than less urban but more free states (urbanization rate and regulatory freedom are negatively correlated, see Tables A1 and A2).

In the results for the second event (time from rollout until legislation passage), regulatory freedom once more has a significant, positive effect. The hazard ratio associates a one-unit higher regulatory freedom score with a 30 percent greater monthly likelihood of legislation passage. Moreover, these results suggest that greater *taxi contributions* correspond to a greater likelihood of legislation passage, but these effects are only significant at the 10 % level.

*Table 4. Results from estimating (3). Outcome of interest: Time to event (in months)[a]*

|  | Origin to Rollout: Hazard ratios | Rollout to Legislation: Hazard ratios |
|---|---|---|
| Regulatory policy | 0.83* | 1.30** |
|  | (0.01) | (0.02) |
| Urbanization rate | 1.58*** | 1.07 |
|  | (0.03) | (0.02) |
| Taxi contributions (000s) | 1.08 | 1.57* |
|  | (0.07) | (0.10) |
| Ridesharing contributions (000s) | 1.20 | 1.20 |
|  | (29.46) | (0.02) |
| Unknown contributions (000s) | 0.83 | 0.87 |
|  | (0.37) | (0.02) |
| Obs | 1,793 | 1,212 |
| Groups | 45 | 45 |
| A1Cc | 249 | 247 |
| Relative Likelihood (within/overall) | 0.000/0.000 | 0.082/0.014 |

Note: Standard errors within parentheses. ***, **, * denote significance at the 1, 5, and 10 % level. [a]*Legislation passed* (0/1) is used to measure the time until the occurrence of the two events, defined by stratification.

*4.2. Robustness checks*

We undertake several robustness tests, all of which are available from the authors upon request. First, we investigate whether specific aspects of regulatory freedom drive the significant results or if they accrue to a broader conception of regulatory freedom. To do so, we employed each of the regulatory policy's seven major subcomponents as main independent variables in Equations (1)-(3), with results revealing that a majority of them are significant with the same sign as overall regulatory freedom, though labor market freedom and occupational freedom are never significant. To us, this confirms the importance of a state's overall regulatory freedom, i.e., that several regulatory policies jointly affect the time until ridesharing legislation passage, rather than a few specific aspects driving the results.

An associated issue is whether other freedom measures, and other aspects of states' institutional arrangements, yield similar results. Starting with the other underlying component of the overall Freedom in the 50 States score, fiscal policy; this variable is never significant when included instead of regulatory policy in Equations (1)-(3). The fact that the overall economic freedom score is significant when included in Equations (1)-(2), but not in the first or second stage of Equation (3) also suggests that regulatory freedom is what matters, rather than overall economic freedom. We find support for the same conclusion when repeating Equations (1)-(3) using the Fraser Institute's EFNA index and its main components: size of government, taxes, and labor market freedom, as none of these coefficients are significant. Labor market policy is obviously a part of regulatory policy, but as mentioned, the labor market subcomponent of the Freedom in the 50 States score is not significant either.

Along similar lines, a plausible assumption could be that more regulatory freedom reflects an underlying variable of greater importance, such as honesty of public officials, which makes the passing of legislation filling regulatory voids easier. To examine this, we employ the Public Integrity Section's (2018) data on conviction rates of public officials to proxy for public corruption, finding no significant results. In summary, these results suggest that institutional arrangements other than regulatory freedom matter less for the filling of regulatory voids, at least where ridesharing is concerned.

We also exploit the state-month data from equation (3) to undertake panel estimations, deeming probit and logit models most suitable given the dichotomous nature of the dependent variable. Logit models (with or without fixed effects) failed to converge, likely because of the abundance of zeros in the dependent variable, but results from probit models using random effects (fixed effects are not an option for this model) reveal positive and significant

coefficients for regulatory freedom, with the effect size roughly similar to the PWP-GT model. Panel OLS with time- and state-specific fixed effects are qualitatively similar.

Finally, while the PWP-GT model offers some evidence that political contributions mattered for legislation passage, all political contribution variables remain insignificant in Equations (1)-(2) even if regulatory freedom is excluded. However, when the sample for (1)-(2) is limited to include only the 10 states that saw the earliest ridesharing launch, both *taxi contributions* and *ridesharing contributions* have significant coefficients, the signs suggesting taxi contributions hampered legislation passage in the early states, while ridesharing contributions facilitated passage. Incidentally, among those states that saw early rollout, 7 are among the 10 that took the longest to legislate. Possibly, following these early, drawn-out battles, both ridesharing and taxi companies realized ridesharing would be legalized in most states and ceased providing as many contributions. This is supported in that contributions from both taxi and ridesharing companies were concentrated in the first 10 states, representing 30% of total contributions to all states.

# 5. Concluding Discussion

Institutional arrangements are a key determinant of entrepreneurship (Gohmann et al., 2008, 2013; McMullen et al., 2008; Sobel, 2008), yet few studies acknowledge the existence of an indirect, adaptive institutional effect that is crucial in any evolving economy: how existing institutions facilitate or hamper the introduction of new regulations in the many instances when new forms of entrepreneurship clash with extant rules and regulation (Thierer, 2016). The key issue is one of adaptability: if certain institutional and regulatory contexts determine whether regulatory voids can be filled. While a polity can afford forgoing some opportunities, an overall lack of flexibility vis-à-vis new forms of entrepreneurship will arguably be costly (Kingston & Caballero 2009). Thus, filling regulatory voids is crucial for a flexible society.

We drew on public choice theory to hypothesize that greater regulatory freedom would facilitate the filling of regulatory voids. To examine this issue, we explored the introduction of statewide ridesharing legislation across American states following the initial rollout of ridesharing, a service that at first usually operated at the fringes of legality. We find that states with greater regulatory freedom more quickly passed statewide ridesharing legislation, suggesting that regulatory freedom could be key to a polity's adaptive capability.

*5.1. Contributions*

This article makes several contributions. First, we highlight a largely overlooked way in which formal institutional arrangements like regulations indirectly matter for entrepreneurship and innovation by demonstrating that extant regulatory freedom matters for filling regulatory voids. A key implication is that polities characterized by low regulatory freedom will be at an adaptability disadvantage vis-á-vis new and unfamiliar forms of entrepreneurship; while entrepreneurial firms may still employ evasive strategies to enter these markets, their legitimacy struggles may be more difficult, and the highly regulated society may find it more difficult to balance the benefits these newcomers bring against the disadvantages. By focusing on a developed economy like the United States, we also contribute to the broader institutional void literature, which is usually centered on developing contexts. We also demonstrate the usefulness of public choice theory for understanding these kinds of situations, notably by illuminating how actors' bargaining positions on new legislation are contingent on the extant regulatory environment and by highlighting how actors can strategically choose the legislative arena that best suits their needs.

In the process, we contribute to the discussion on institutional dynamics and entrepreneurship, by highlighting how institutional embeddedness affects entrepreneurs' possibility to affect institutional change. The observation that institutions change at different paces (Kingston & Caballero, 2009, p. 169-170) is applicable to our example, as we observe how a relatively fast-changing formal institution, the political legislature which in theory can act quickly to introduce new legislation, is constrained by a relatively slow-changing formal institutional environment, namely the state's regulatory freedom. Moreover, our study suggests that institutional entrepreneurs can shape and use public opinion to further their legislative efforts. That said, such shifts in public opinion are unlikely to transpire unless the market service that the entrepreneurs offer is impactful and considered valuable by large facets of the population.

Relatedly, our results highlight that the relationship between entrepreneurship and institutions is, in fact, bidirectional. Institutions affect entrepreneurial activities, but entrepreneurs also shape institutions (Elert & Henrekson, 2017). We illustrated this fact by highlighting the different ways profit-driven ridesharing firms engaged in institutional entrepreneurship at different stages of the business model's development (cf., Li et al., 2006). Thus, ridesharing firms first evaded institutional constraints, later specified the political arena where their change efforts would be most effective (the state, rather than the local level), and

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further strengthened their position to affect change by engaging in efficient lobbying and coalition-building at that level. Thus, in line with Gurses & Ozcan (2015), Garud et al. (2020), and other case studies of entrepreneurial legitimacy struggles with respect to, e.g., the electric light bulb (Hargadon & Douglas, 2001), the digital TV recorder (Ansari et al., 2016), and clean technology (Zietsma et al., 2018), we highlight the institutional contexts that enable entrepreneurs to affect (self-serving, yet potentially socially beneficial) change by shaping popular opinion, persuading institutional actors, and combatting defenders of the status quo.

*5.2. Future research directions*

Researchers inspired by our inquiry may consider studying the fate of other new entrepreneurial forms, e.g., juxtaposing jurisdictions where regulatory voids were and were not filled and examine the institutional and regulatory antecedents of these processes and their economic consequences. What is required, in our view, are 1) detailed case studies delving into the specific chain of events that lead to increased legitimacy and new legislation and 2) quantitative studies in the vein of our contribution, exploiting cross-country or cross-state variation over time. Interesting cases are easy to find, given institutional clashes over, e.g., genetic analysis, bitcoin, 3-D printing, advanced medical devices (Thierer, 2016), and driverless cars (Downes, 2016). Future ridesharing and sharing economy research should examine legislation passage across countries to determine whether the relationship we identify holds at the national level. After all, ridesharing inspires legal struggles beyond the United States, see, e.g., the legal ban against Uber in Germany (Reuters, 2019) and the licensing restriction in London (BBC, 2019). Nor is passing legislation an end to all strife, as ridesharing firms find themselves in continued legislative conflicts, e.g., in California and New York City (e.g., Davidsson & Infranca, 2016). Whether regulatory freedom or other aspects of formal institutional arrangements affect these long-term battles is an important research question.

Finally, by employing the stratified extension of the hazard model (PWP-GT), we introduce entrepreneurship researchers to a potentially useful model. The model should be valuable to entrepreneurship researchers considering the effect of the same set of covariates on other events that are related yet of a fundamentally different nature. Doing so prevents the relationships influencing one event from confounding the relationships influencing subsequent events (the only limit on how many consecutive events can be analyzed is the sample size, as the risk set declines with each additional strata). Entrepreneurship scholars could, for example, use this model to examine several rounds of legislation following an instigating event, e.g., the rollout of a new product of service clashing with existing rules and legislations. The effects of

covariates on firm performance or survival following events such as legislation or technology adoption is another fruitful venue.

*5.3. Limitations*

Like any study, ours has its limitations. One concern is the extent to which our results can be generalized to other contexts or are industry-specific, meaning similar studies of other industries should initially consider a broad set of institutional variables. As an example, while we found fiscal freedom to be insignificant, it may be important for filling regulatory voids in sectors where taxes are a more immediate concern, e.g., accounting or finance.

Omitted variable bias is another potential concern, which we hope to have eased through the inclusion of additional variables and the use of panel models in the robustness checks. That results can be interpreted similarly for different dependent variables and different models also strengthens our confidence in the paper's key finding. That said, a lack of data meant we could not include any variable capturing differences in public support for ridesharing across states, even though this may well have influenced the time until legislation. Hopefully, future studies with access to such data can remedy this shortcoming.

Moreover, we should stress that passing legislation is not a panacea. Our approach of focusing on the first statewide ridesharing legislation passage had the benefit that the legislative content was similar across states. Additional legislative rounds have been less uniform, with states focusing on a variety of issues, e.g., as fingerprinting requirements, vehicle emissions, and drivers' labor status. This variability makes it more difficult to treat additional legislation events as equal but may be considered a feature rather than a bug of an evolving institutional system. Investigating whether regulatory freedom and other variables affect these long-term battles is another important avenue for future research—one where we believe the stratified hazard model may further prove its usefulness.

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# Appendix

*Table A1: Correlations for variables in estimations of Equations (1) and (2), unit of analysis: state\*  (N=49).*

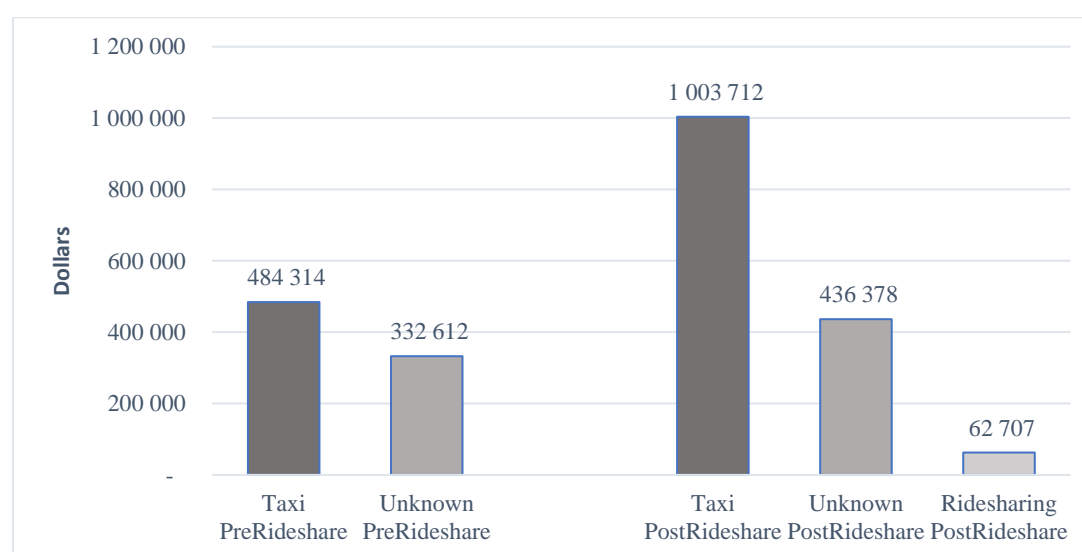| | Days until legislation | Regulatory Policy | Order of rollout | Taxi contributions (000s) | Ridesharing contributions (000s) | Unknown contributions (000s) | Urbanization Rate |
|---|---|---|---|---|---|---|---|
| Days until legislation | 1.00 | | | | | | |
| Regulatory freedom | -0.53 | 1.00 | | | | | |
| Order of rollout | -0.67 | 0.33 | 1.00 | | | | |
| Taxi contributions (000s) | 0.04 | -0.07 | -0.03 | 1.00 | | | |
| Ridesharing contributions (000s) | -0.07 | 0.09 | -0.04 | 0.17 | 1.00 | | |
| Unknown contributions (000s) | 0.03 | -0.04 | -0.02 | 0.50 | 0.04 | 1.00 | |
| Urbanization rate | 0.49 | -0.30 | -0.63 | 0.29 | 0.08 | 0.19 | 1.00 |

\*Correlations for only states that saw legislation after rollout (n=45) in Equation (2) are available upon request.

*Table A2: Correlations for variables in Equation (3), unit of analysis: state-month\* (N=1,212).*

| | Legislation passed (0/1) | Regulatory freedom | Taxi contributions (000s) | Ridesharing contributions (000s) | Unknown contributions (000s) | Urbanization rate |
|---|---|---|---|---|---|---|
| Legislation passed (0/1) | 1.00 | | | | | |
| Regulatory freedom | 0.06 | 1.00 | | | | |
| Taxi contributions (000s) | 0.00 | 0.18 | 1.00 | | | |
| Ridesharing contributions (000s) | 0.05 | -0.06 | 0.18 | 1.00 | | |
| Unknown contributions (000s) | -0.02 | -0.24 | 0.42 | 0.02 | 1.00 | |
| Urbanization rate | -0.05 | -0.35 | 0.21 | 0.11 | 0.17 | 1.00 |

\*Correlations for the first event (n=1,793) in Equation (3) are available upon request.

*Figure A1. State-level taxi market political contributions before and after ridesharing rollout.*



Source:  National Institute on Money in Politics (2018).