

RESEARCH ARTICLE

# Informational lobbying, information asymmetry, and the adoption of the ride-hailing model policy in the U.S. States

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## Abstract

Existing research on lobbying has predominantly focused on its material returns, such as equity returns, stock prices, and government contracts while overlooking its informational impact. This paper addresses this gap by investigating to what extent and under what conditions policymakers assimilate information delivered through corporate lobbying. Drawing on an informational perspective, it proposes that the informational effect of lobbying is moderated by the information asymmetry between policymakers and firms. Focusing on the U.S. ride-hailing industry, this study utilizes a unique dataset on U.S. state legislatures' adoption of the model policy lobbied by ride-hailing companies. The results reveal that the informational impact of corporate lobbying is highly contingent upon the presence of information asymmetry between policymakers and firms, which can be attributed to policymakers' resources for independent information gathering, information deliberation through public hearings or media discussions, and countervailing lobbying efforts.

**Keywords:** lobbying; corporate political activity; information asymmetry; model policy

## Introduction

Lobbying is a longstanding corporate political activity that firms deploy to shape policymaking through the transfer of information.<sup>1</sup> To capture the effectiveness of lobbying in helping firms advance their interests, existing research has examined how firms' monetary expenditures in persuading government officials are associated with firm-level outcomes, such as equity returns, stock prices, and government contracts,<sup>2</sup> as well as the enactment of policies.<sup>3</sup> However, this prevalent emphasis on the material returns to lobbying, primarily driven by data availability, can obscure the informational nature of lobbying. An alternative informational view of lobbying contends that the financial resources firms allocate to lobbying activities do not automatically generate pressure on policymakers. Instead, the transmission of information plays the key role, as policymakers seek information to determine their position on a given issue and choose the best policy option.<sup>4</sup> For this reason, despite many studies on the effectiveness of lobbying, we still know little about to what extent and under what circumstances lobbying can effectively deliver information to policymakers.

The investigation of the effectiveness of lobbying in delivering information has been constrained by data. This is because lobbying often takes place in a private and covert manner, and measuring and quantifying the information transmitted through lobbying is challenging.<sup>5</sup> To overcome this challenge, this paper focuses on the U.S. ride-hailing industry and utilizes a unique dataset on the adoption of the

<sup>1</sup>Hillman and Hitt (1999); de Figueiredo and Richter (2014); de Figueiredo (2002).

<sup>2</sup>e.g., Kim (2008); Borghesi and Chang (2015); Ridge, Ingram, and Hill (2017).

<sup>3</sup>e.g., Kang (2016); Schuler (1996); Baumgartner et al. (2009).

<sup>4</sup>Potters and van Winden (1990); Austen-Smith and Wright (1996); Bennesen and Feldmann, (2002).

<sup>5</sup>Bombardini and Trebbi (2020).

ride-hailing model policy by U.S. state governments. Model policies are draft policies promoted by firms on a particular issue to wider groups of legislators as the template for policymaking.<sup>6</sup> Since 2015, ride-hailing firms have employed an army of lobbyists to promote a model policy to the fifty state governments.<sup>7</sup> The content of the ride-hailing model policy was made available by the Centre for Media and Democracy,<sup>8</sup> and as of now, 49 U.S. state governments have passed 86 policies governing ride-hailing services. By analyzing the extent to which the passed policies incorporate the model policy across different states, I aim to capture variation in policymakers' adoption of information delivered through firm lobbying. Additionally, I will explore the conditions that contribute to these varying levels of information intake.

Building upon the informational perspective of lobbying, this paper proposes that policymakers' intake of information provided by firms is co-determined by two key factors: the lobbying efforts made by firms to transmit information and the information asymmetry between policymakers and firms. This paper further argues that such information asymmetry is the result of (1) policymakers' resources to gather their own information on a given issue, (2) information deliberation through public hearings or media discussions, and (3) countervailing lobbying efforts. The empirical findings in the U.S. ride-hailing industry provide compelling support for this argument, indicating that the informational impact of lobbying activities of ride-hailing firms is heavily reliant on the presence of significant information asymmetry between state legislators and ride-hailing firms.

This study is expected to make several contributions to the literature on corporate political activities (CPAs). First, it shifts the focus from the traditional emphasis on the material returns of corporate lobbying to the informational view of lobbying. It speaks to the growing body of work on informational lobbying by analyzing the delivery of information not merely as the substance but also as the outcome of lobbying activities.<sup>9</sup> Second, this research addresses the long-standing data restriction and measurement challenges in lobbying studies regarding the informational impact of lobbying.<sup>10</sup> It overcomes this limitation by leveraging a unique dataset on the adoption of the ride-hailing model policy by fifty U.S. state governments. Third, this study contributes to the emerging stream of CPA literature that focuses on the supplier side of the political market.<sup>11</sup> It sheds light on information asymmetry as a crucial characteristic of policy suppliers. It provides a nuanced picture of how information asymmetry moderates the impact of firm lobbying, while not affecting petitions and campaign contributions.

## Theory and hypotheses

### *An informational view of lobbying*

Firms engage in various CPAs to influence public policies in their favor.<sup>12</sup> These activities include providing information, building constituencies, and making financial contributions.<sup>13</sup> Among them, lobbying, which refers to the transfer of information between firms and politicians in private settings,<sup>14</sup> is the most commonly used corporate political strategy.<sup>15</sup> This is because compared to campaign contributions, which provide financial support to political candidates during elections, lobbying is low-profile and subject to less public scrutiny<sup>16</sup>; unlike grassroots mobilization, which relies on third-party

<sup>6</sup>Hertel-Fernandez (2014).

<sup>7</sup>Borkholder et al. (2018).

<sup>8</sup>CMD (2017).

<sup>9</sup>Albareda, Braaun and Fraussen (2023); Austen-Smith (1993).

<sup>10</sup>Bombardini and Trebbi (2020).

<sup>11</sup>Choi, Jia, and Lu (2015); Wang, Du, and Marquis (2019).

<sup>12</sup>Hillman, Keim, and Schuler (2004).

<sup>13</sup>Hillman and Hitt (1999); Bonardi, Holburn, and Vanden Bergh (2006).

<sup>14</sup>de Figueiredo and Richter (2014).

<sup>15</sup>Milyo et al. (2000).

<sup>16</sup>Djankov et al. (2010).

stakeholders to pressure politicians, lobbying allows firms to directly convey their demands without distortion.<sup>17</sup>

Existing CPA literature has predominantly treated lobbying as a material transaction between firms and politicians.<sup>18</sup> Early studies placed significant emphasis on the amount of expenditure firms spend on lobbying government officials,<sup>19</sup> but more recently, research has started to focus on the specific government entities targeted by firm lobbying and the breadth of their lobbying expenditure.<sup>20</sup> Moreover, the current measurements of returns to lobbying have mostly focused on firm-level material benefits, such as accounting-based firm performance,<sup>21</sup> government contracts awarded to a focal firm,<sup>22</sup> tax breaks,<sup>23</sup> and stock market prices.<sup>24</sup> For instance, Chen, Parsley, and Yang's comprehensive analysis of firms in Compustat showed that firms' lobbying expenditures are positively associated with their performance, measured by assets, sales, and stock prices.<sup>25</sup> To a lesser extent, a few studies have underscored the enactment of policies as the consequence of lobbying.<sup>26</sup> For example, Kang indicated that the energy industry's lobbying efforts had a significant, albeit modest, impact on the probability of energy law enactments by the U.S. Congress.<sup>27</sup> This emphasis on the material returns to lobbying is primarily driven by the availability of data, as the data on firm-level benefits, and policy enactments are accessible and observable.<sup>28</sup>

However, this prevalent focus on material returns to lobbying overshadows the fact that lobbying inherently involves transmission of information and that firms can directly benefit from transmitting their private information into public policies.<sup>29</sup> A group of political scientists has advocated for an informational view of lobbying, which posits that the interaction between firms and politicians primarily involves the exchange of information and messages, rather than material goods or services.<sup>30</sup> Although firms allocate financial resources to lobbying activities, this money is not explicitly transferred to politicians, as is the case with campaign contributions.<sup>31</sup> Instead, the value of lobbying lies in "the storage of good information and the ability to convey it in a useful way" (quoted in Levine, 2009). On the one hand, policymakers always feel "information starved" (quoted in Levine, 2009)—They need information to choose the best alternative among all policy options and decide their positions on a policy issue to enhance their own chances of re-election.<sup>32</sup> On the other hand, firms acquire relevant information, and they gain influence by strategically revealing that information through lobbyists to sway policymakers toward their preferred policy.<sup>33</sup> The National Institute for Lobbying and Ethics made this statement, "Information must be provided in order to produce informed decisions. Public officials cannot make fair and informed decisions without considering information from a broad range of interested parties"<sup>34</sup>

The importance of informational lobbying has also been highlighted by some empirical and model studies. For example, Drutman and Hopkins, through an analysis of emails sent by Enron employees, demonstrated that Enron's lobbying efforts relied on their "monopoly on policy-relevant information"

<sup>17</sup>Wen and Yue (2021).

<sup>18</sup>Grossman and Helpman (1994); Bombardini and Trebbi (2020).

<sup>19</sup>Brasher and Lowery (2006); Drope and Hansen (2006); Kim (2008).

<sup>20</sup>Albareda et al. (2023); Ridge et al. (2017).

<sup>21</sup>Unsal, Hassan, and Zirek (2016); Lambert (2019).

<sup>22</sup>Ridge et al. (2017); Kim (2019).

<sup>23</sup>Richter, Samphantharak and Timmons (2009).

<sup>24</sup>Hill et al. (2013).

<sup>25</sup>Chen, Parsley and Yang (2015).

<sup>26</sup>Baumgartner et al. (2009); Schuler (1996); Grasse and Heidebreder (2011).

<sup>27</sup>Kang (2016).

<sup>28</sup>Bombardini and Trebbi (2020).

<sup>29</sup>Grossman and Helpman (2011).

<sup>30</sup>Potters and van Winden (1990); Austen-Smith and Wright (1996); Bennedsen and Feldmann, (2002); U.S. Constitution, amend. I.

<sup>31</sup>de Figueiredo (2002).

<sup>32</sup>Milyo et al. (2000).

<sup>33</sup>Schnakenberg (2017)

<sup>34</sup>National Institute for Lobbying and Ethics, (n.d.).

to persuade policymakers.<sup>35</sup> Austen-Smith introduced a policymaking model accounting for incomplete information, where he posits that lobbyists, though without legislative power, can exert great influence on policies with the specialist information they offer, and their influence differs at different policy stages.<sup>36</sup> Similarly, several case studies emphasized the idea of “access”, which refers to the exchange of policy-relevant information with public actors.<sup>37</sup> Furthermore, Bruycker identified two modes of information supply of lobbying: one is the transmission of technical, economic, and legal expertise, and the other is political information, which is to indicate the level of public support and opposition to a specific decision.<sup>38</sup> These are echoed in the work of Albareda and colleagues, whose survey of EU public officials suggests that the capacity of interest groups to affect policy is linked to their supply of both technical expertise and insights into public sentiment.<sup>39</sup>

Despite the growing body of work on informational lobbying, it has failed to capture the effectiveness of lobbying in delivering information. In the political market where both firms and politicians derive private gains from their exchange,<sup>40</sup> such gains for corporate lobbying accrue not only from corporates’ material outcomes but also from the extent to which policymakers assimilate the information transmitted through corporate lobbying. Lobbying activities have traditionally taken place covertly within private settings, making it challenging to discern the specifics of the information being communicated.<sup>41</sup> Additionally, quantifying and measuring information itself poses a significant challenge. Obtaining data on the informational need of government agents and measuring their intake of the information provided is difficult, further complicating the research process.<sup>42</sup> This paper aims to fill this gap by investigating the extent to which and under what conditions policymakers adopt information delivered through corporate lobbying. Specifically, it employs a unique dataset of the model policy lobbied by U.S. ride-hailing firms. By measuring the extent to which the model policy is manifested in the enacted policies, it captures the informational impacts of lobbying.

As indicated by the informational view of lobbying, it is expected that with more corporate lobbying efforts to deliver information, policymakers would incorporate a greater amount of corporate-derived information into their policymaking. Here the lobbying efforts are operationalized as the number of lobbyists because firms can achieve the spread of information through multiple lobbyists. Network theory suggests that a greater number of lobbyists can tap into diverse networks and channels within the political sphere, therefore facilitating information spread.<sup>43</sup> Communication theory also indicates that more lobbyists mean information redundancy, which increases the likelihood that key messages reach their intended targets.<sup>44</sup> It therefore generates the baseline hypothesis as follows.

*Baseline Hypothesis: The volume of information policymakers adopt from firms is positively associated with firms’ lobbying efforts.*

Additionally, the effectiveness of lobbying is contingent upon contextual factors, especially the characteristics of policy suppliers.<sup>45</sup> A growing body of CPA research has recognized the heterogeneous and dynamic nature of politicians’ receptivity to corporate political strategy, shifting focus from the demand side to the supply side of the political market.<sup>46</sup> As highlighted by two recent reviews of CPA scholarship, firms engage with various government actors within specific institutional contexts.<sup>47</sup>

<sup>35</sup>Drutman and Hopkins (2013).

<sup>36</sup>Austen-Smith (1993).

<sup>37</sup>Beyers (2002), Bouwen (2002), Bouwen (2004).

<sup>38</sup>De. Bruycker (2016).

<sup>39</sup>Albared, Braun, and Fraussen (2023).

<sup>40</sup>Bonardi, Hillman and Keim (2006), Hillman and Hitt (1999).

<sup>41</sup>Nothhaft (2017).

<sup>42</sup>Bombardini and Trebbi (2020).

<sup>43</sup>Burt (2000).

<sup>44</sup>Cutlip (1962).

<sup>45</sup>Ridege et al. (2017).

<sup>46</sup>McDonnell and Werner (2016); Wang, Du and Marquis (2019); Hadani, Bonardi and Dahan, (2017).

<sup>47</sup>Katic and Hillman (2023); Lenway et al. (2022); Powell (2012).

Notably, Choi et al. utilized cross-country firm-level data and found that the influence of firms' lobbying activities on public policies depends on the levels of political competition and electoral accountability faced by policymakers in different countries.<sup>48</sup> This paper delves into one particular feature of policy suppliers—information asymmetry, and its impact on the effectiveness of lobbying, measured by policymakers' assimilation of information from firms.

### *Information asymmetry between policymakers and firms*

The informational view of lobbying is based on the premise that policymakers are less informed than firms on a relevant policy issue.<sup>49</sup> Policymakers face significant challenges when it comes to accessing and evaluating the economic and technical consequences of policies and gauging public opinion on them. Meanwhile, much of the information necessary for assessing the economic consequences of policies is readily available to businesses.<sup>50</sup> This information asymmetry arises not only from the capacity limitations and broader range of responsibilities faced by policymakers,<sup>51</sup> but also from firms' incentives to research issues of concern for their own survival. Moreover, firms have the advantage of gathering information about relevant policy matters through their daily operations, granting them access to private information that holds significant importance for political decision-making.<sup>52</sup> For example, a case study by Mello, Abiola, and Colgrove highlighted that Merck's provision of policy-relevant information resulted in the introduction of cervical cancer vaccinations in 41 states and proposed mandates in 24 states for teenage girls.<sup>53</sup> Policymakers openly acknowledged their reliance on Merck's lobbying efforts for making policy changes. Gao and McDonald's recent case study on the personal genomic industry discovered that the industry organized a series of private workshops and meetings with the Food and Drug Administration, which was in information deficiency of the new technology; as a result, the industry was able to develop a set of recommendations for personal genomics, including data privacy and accuracy of test results, which were eventually adopted by the regulators.<sup>54</sup> This paper argues that information asymmetry between policymakers and firms is the result of three factors: firstly, policymakers have limited resources to independently gather information regarding policy issues; secondly, there is an absence of public deliberation concerning the matter; and thirdly, there is a deficiency in countervailing lobbying activities.

### *Information gathering*

Policymakers tend to gather information with regard to a given issue on their own in order to choose the best alternative among all policy options.<sup>55</sup> They are aware that firms can selectively present or withhold information in a manner that aligns with their own interests.<sup>56</sup> However, policymakers require resources to gather information.<sup>57</sup> The concept of legislative professionalism was created to refer to the amount of resource policymakers can devote to policymaking.<sup>58</sup> On one end, professional legislatures receive relatively high pay, have large staffs, and tend to hold no other jobs outside of their political position. On the other end, the so-called citizen or amateur legislatures have small staffs, receive relatively low compensation, and usually have another income source.<sup>59</sup> Professional legislators are able to conduct research on a given issue and tailor policies to their own needs.<sup>60</sup> Part-time policymakers,

<sup>48</sup>Choi et al (2015).

<sup>49</sup>Bombardini and Trebbi (2020).

<sup>50</sup>Van Winde (1999).

<sup>51</sup>Bernhagen and Bräuninger (2005).

<sup>52</sup>Polk (2002).

<sup>53</sup>Mello, Abiola, and Colgrove (2012).

<sup>54</sup>Gao and McDonald (2022).

<sup>55</sup>Ellis and Groll (2020).

<sup>56</sup>Schlozman and Tierney (1983).

<sup>57</sup>Baumgartner et al. (2009).

<sup>58</sup>Woods and Baranowski (2006).

<sup>59</sup>Grumm (1971).

<sup>60</sup>Hertel-Fernandez (2014).

especially those who are not well compensated, have no time or motivation to adequately gather information on larger and more complex issues.<sup>61</sup> Policymakers' capacity to collect information can also be compromised in the absence of experienced supporting staff, such as scientists to help forecast its benefits and risks, economists and accountants to calculate expenditure, and committee staff to conduct research and provide internal sources of information.<sup>62</sup>

The significance of resource constraints faced by policymakers has been extensively documented. Adopting a resource exchange perspective, various research suggests that public officials often seek the expertise, specialized knowledge, or political acumen of interest groups, which in turn bolsters the legitimacy and effectiveness of forthcoming legislations.<sup>63</sup> In particular, scholars have highlighted the heavy reliance of constrained policymakers on information from firms,<sup>64</sup> and how this reliance transforms firms into de facto "service bureaus".<sup>65</sup> The growing dependence of policymakers on firms for information can be attributed to the escalating complexity of policy issues and the declining policymaking capacity in the United States.<sup>66</sup> As an example, at the Federal level, there is a decline in congressional staff while the workload remains steady in terms of bill introductions and passage; meanwhile, an increase in the number of votes and pages in the Federal Register indicates a growing level of policy complexity.<sup>67</sup> By this view, policymakers, who are operating with limited resources to gather information, are more likely to rely on information provided by firms. Therefore, the hypothesis is summarized as follows.

*Hypothesis 1: The positive relationship between corporate lobbying and policymakers' adoption of information from corporations is weakened as policymakers' capacity for independent information gathering increases.*

### *Information deliberation*

Policy deliberation is a process in which policymakers, stakeholders, and members of the public discuss information, ideas, and perspectives related to a particular policy issue.<sup>68</sup> In this process, individuals can cultivate and articulate their viewpoints, acquire knowledge about the positions of others, and ultimately gain insight and make informed judgments about matters of public significance.<sup>69</sup> It provides a platform for policymakers to directly listen to different perspectives and information on a policy issue from different stakeholders.<sup>70</sup> Policymakers may therefore be exposed to new information that they had not previously known or considered, which can lead to a greater understanding of the issue at hand.<sup>71</sup> For instance, it has been shown that individuals who engaged in a sequence of deliberative discussion regarding the influence of money in politics exhibited enhanced understanding of the subject matter.<sup>72</sup> In a similar vein, policy deliberation can lead to more inclusive policy outcomes that take into account the demands and concerns of different groups rather than heavily leaning towards one party.<sup>73</sup> An experiment by Fishkin et al. demonstrated that deliberative polling—which involves balanced information intake, in-depth discussion with a diverse group, and moderator intervention to balance participation—yields more considered opinions than traditional polling methods.<sup>74</sup>

<sup>61</sup>Jansa, Hansen and Gray (2019).

<sup>62</sup>Bowen and Greene (2014).

<sup>63</sup>Bouwen (2002), James and Christopoulos (2018).

<sup>64</sup>Lessig (2011).

<sup>65</sup>Hall and Deardorff (2006).

<sup>66</sup>Drutnam (2015).

<sup>67</sup>Ellis and Groll (2020).

<sup>68</sup>Lindeman (2002).

<sup>69</sup>Benhabib (1992); Habermas (1989).

<sup>70</sup>Jacquet and van der Does (2021).

<sup>71</sup>Barabas (2004).

<sup>72</sup>Carpini, Cook and Jacobs (2004).

<sup>73</sup>Neshkova and Guo (2012).

<sup>74</sup>Fishkin et al. (2015).

Public hearings play a significant role in facilitating deliberation for policy formation, as they provide a structured platform for evaluating critical social, technological, and economic matters through formalized procedures.<sup>75</sup> In a public hearing, a legislative body invites representatives from government agencies, industries, academic researchers, advocacy groups, and members of the public to provide testimonies or comments on the proposed policy or decision.<sup>76</sup> Public hearings channel demands that are difficult for government to address because of limited resources, and provide an opportunity to challenge the prevailing discourse.<sup>77</sup> Mass media is another primary channel for political deliberation.<sup>78</sup> Page, while recognizing the “face-to-face ideal” for conventional deliberation, suggests that in contemporary democracies, deliberation is predominantly conducted through mass media, “who not only help policy experts communicate with each other, but also assemble, explain, debate, and disseminate the best available information and ideas about public policy, in ways that are accessible to large audiences of ordinary citizens.”<sup>79</sup> Habermas also refers to the mass media as the dominant public sphere of Western democracies where citizens can express their viewpoints and engage in critical debates.<sup>80</sup> Media coverage of an issue enhances policymakers’ and the public’s access to information regarding an issue, and consequently, they tend to form their views based on the information readily accessible to them through mass media sources.<sup>81</sup> It is therefore expected that information deliberation, represented by public hearings and media discussion, can weaken the informational impact of corporate lobbying on policymakers. The hypotheses are as follows.

*Hypothesis 2a: The positive relationship between corporate lobbying and policymakers’ adoption of information from corporations is weakened with the occurrence of public hearings.*<sup>82</sup>

*Hypothesis 2b: The positive relationship between corporate lobbying and policymakers’ adoption of information from corporations is weakened with more local media discussion.*

### Countervailing forces

Countervailing force theorists posit that in the regulatory landscape, the power of large businesses to influence policy decisions is moderated by the presence of opposing groups. These groups exert their own form of power to negotiate and advocate for interests that may counteract those of dominant firms, thus restoring public welfare and fair market practices.<sup>83</sup> Specifically, Austen-Smith and Wright pointed out that competing groups lobby strategically and counteractively to offset information from a group, so the result is a policy outcome that reflects the relative influence of the competing lobbying efforts.<sup>84</sup> In addition, the trustworthiness of each lobbyist’s information plays a critical role in whose input is valued more in the policymaking process.<sup>85</sup> It follows that when opposing lobbyists present conflicting information or perspectives, policymakers must discern which sources are more reliable and are less likely to fully trust any single party. It is therefore expected that the informational impact of corporate lobbying is diminished by the presence of countervailing lobbying efforts.

*Hypothesis 3: The positive relationship between corporate lobbying and policymakers’ adoption of information from corporations is weakened with more countervailing lobbying efforts.*

<sup>75</sup>Gephart (2007).

<sup>76</sup>Ridge et al, (2019); Topal, (2009).

<sup>77</sup>Gephart and Pitter (1993).

<sup>78</sup>Strömbäck and Shehata (2010).

<sup>79</sup>Page (1996): 5.

<sup>80</sup>Habermas (1989).

<sup>81</sup>Scheufele and Tewksbury (2007).

<sup>82</sup>Here, “public hearings” pertain to those where policymakers are directly involved, such as in committee and legislative hearings.

<sup>83</sup>Galbraith (1954).

<sup>84</sup>Austen-Smith and Wright (1994).

<sup>85</sup>Levine (2009).

## Data and method

### *Empirical context: the ride-hailing model policy*

Ride-hailing firms, also known as transportation network firms (TNCs), utilize digital platforms to connect riders with private drivers. The ride-hailing sector is markedly monopolized, with Uber commanding the majority of the market at around 70 percent, followed by Lyft with about 20 percent. This study thus only focuses on these two companies. This industry was created in a regulatory gray area, with these firms asserting that they should be categorized as technology firms and exempt from traditional taxi regulations.<sup>86</sup> It sparked protests from taxi drivers nationwide and resulted in over 100 municipal governments implementing bans or moratoriums on ride-hailing firms.<sup>87</sup> The industry was faced with a series of regulatory controversies. For example, one main issue is how to define ride-hailing, especially how to differentiate it from taxi and for-hire services.<sup>88</sup> Insurance is another area of concern, as most traditional auto insurance policies do not cover commercial driving activities. It is unclear how to design insurance policies for ride-hailing drivers who mainly work part-time.<sup>89</sup> Safety is also a significant concern, with the question of whether and how vehicle inspections and driver background checks should be implemented to ensure passenger safety, or whether online ratings of drivers alone can ensure safety.<sup>90</sup>

Starting in late 2014, ride-hailing firms began lobbying state governments in the hope of establishing new state-wide regulatory frameworks to clarify these regulatory issues.<sup>91</sup> To achieve this goal, Uber and Lyft joined the American Legislative Exchange Council (ALEC) and drafted a model policy in December 2014.<sup>92</sup> The model policy contained seven key regulatory issues, including the definition of transportation network firms (TNCs), regulatory authority, liability insurance, operating requirements such as driver background checks and vehicle inspections, information disclosure, conversion from taxi firms to TNCs, TNC funds, and obtaining permission.<sup>93</sup> Ride-hailing lobbyists have been advocating for and circulating the model policy among legislators across states.<sup>94</sup> One sponsor of the model policy praised it as “an effort by the concerned parties to help bring clarity and consistency to TNC laws across the country”.<sup>95</sup> By 2019, most U.S. states have enacted at least one policy to govern ride-hailing. It provides a unique setting to examine under what conditions policymakers assimilate information from firms, as measured by their adoption of ride-hailing model policies.

### *Sample and dependent variables*

The sample for this study included all fifty U.S. states between 2015 and 2019. The sample began in 2015, as the model policy was made in December 2014, and ended in 2019, when most U.S. states had already issued state-wide policies to govern ride-hailing and the wave of ride-hailing policy enactments came to an end.

The dependent variable is *the extent to which policymakers adopt information from firms into policymaking*. This is measured using a proxy variable: the adoption of the ride-hailing model policy by state legislatures. To assess this, I analyzed the text similarity between the model policy proposed by ride-hailing firms and the actual ride-hailing policies passed by state governments within a given year. The original text of the ride-hailing model policy was exposed by the Centre for Media and Democracy (CMD), a nationally recognized watchdog group for corruption and democracy. To triangulate the text, I also retrieved the text of the ride-hailing model policy from the Internet Archive, a nonprofit library

<sup>86</sup>Baron (2018).

<sup>87</sup>Paik, Kang, and Seamans (2019).

<sup>88</sup>Cetin and Deakin (2019).

<sup>89</sup>Posen (2015).

<sup>90</sup>Crespo (2016).

<sup>91</sup>Wen and Yue (2021).

<sup>92</sup>Borkholder et al. (2018).

<sup>93</sup>CMD (2017).

<sup>94</sup>Borkholder et al. (2018).

<sup>95</sup>O'Donnel (2015).



**DRAFT Transportation Network Company Act**

**Summary**

This Act requires transportation network companies to carry liability insurance, conduct background checks on transportation network company drivers, inspect transportation network company vehicles, and obtain a permit from the public utilities commission.

**Model Policy**

**Section 1. {Short Title.}**

This Act shall be known as the Transportation Network Company Act.

**Section 2. {Definitions.}** For the purposes of this Act:

(A) "Transportation Network Company" means a corporation, partnership, sole proprietorship, or other entity that uses a digital network to connect riders to drivers for the purpose of providing transportation.

(1) A transportation network company does not provide taxi service, transportation service arranged through a transportation broker, ridesharing arrangements, or any transportation service over fixed routes at regular intervals.

(2) A transportation network company is not deemed to own, control, operate, or manage the personal vehicles used by transportation network company drivers.

(3) A transportation network company does not include a political subdivision or other entity exempted from federal income tax under section 115 of the federal "Internal Revenue Code of 1986" as amended.

(B) "Public Utilities Commission" or "Commission" means a governing body that regulates the rates and services of public utilities, including transportation utilities.

(C) "Contract carrier" means every person, other than a common carrier or a motor carrier of passengers, who, by special contract, directly or indirectly affords a means of passenger transportation over any public highway of this state; except that the term does not include a transportation network company.

(D) "Motor Carrier" means any person owning, controlling, operating, or managing any motor vehicle that provides transportation in intrastate commerce pursuant

DRAFT Transportation Company Act (2014)

Figure 1. An excerpt of the ride-hailing model policy.

that collects and preserves digital online content. Figure 1 is an excerpt of the model policy. To obtain the texts of all the ride-hailing policies passed by state governments, I searched the keyword "transportation network company (TNC)" in LegiScan, a website tracking all the state-level bills and laws. It shows a total of 86 ride-hailing policies enacted by 49 state governments, except Oregon.<sup>96</sup>

<sup>96</sup>Oregon is the only state that had not enacted any legislations on ride-hailing.

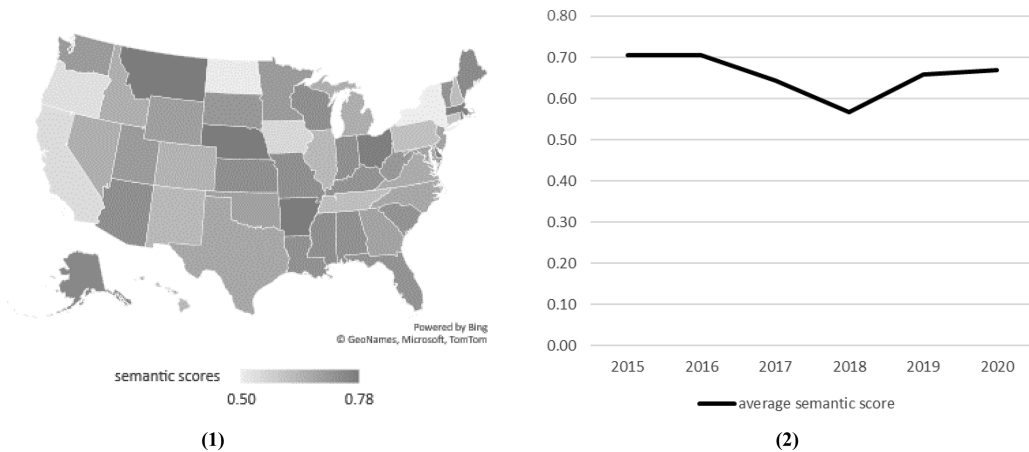


Figure 2. Semantic text similarity score variation by state and by year.

I adopted two approaches to capture text similarity. The first approach is the cosine similarity score. It is a mathematical technique that calculates the cosine of the angle between two vectors, where the vectors represent the frequency of occurrence of each word in the texts.<sup>97</sup> The second approach is semantic matching, which measures the closeness of meaning between two texts, instead of a simple overlap of word sets.<sup>98</sup> I adopted Cortical, a recent AI tool that leverages natural language processing to understand the meaning of text data. It creates a semantic map where related snippets are grouped together and then compares the semantic fingerprints generated from input texts by activating relevant map positions. Both the cosine and semantic similarity scores range from 0 to 1, with 1 indicating perfect similarity between the two texts, and the two scores are highly correlated ( $r = 0.99$ ). Figure 2 (1) illustrates the range of semantic text similarity scores among different states, highlighting an average score of 0.68. It means that the passed ride-hailing policies have incorporated a substantial proportion of the text of the model policy. Figure 2(2) presents variation in average semantic similarity scores across years.

### Independent variables

The major independent variable is *ride-hailing lobbying efforts*, operationalized as the number of lobbyists hired by ride-hailing firms to influence a state government in a year. I obtained data on lobbying by ride-hailing firms from the National Institute of Money in State Politics, which discloses all the registered lobbyists working on state governments and their firm clients. I triangulated the lobbying data with the lobbying database provided by each state government. Lobbyist number is a more appropriate measurement of corporate lobbying efforts on the U.S. state level than lobbying expenditures.<sup>99</sup> This is due to the relatively incomplete lobbying expenditure records on the state level, as approximately 33 states do not mandate lobbyists to report expenditure data.<sup>100</sup> My own dataset also suggests that in over half of the instances where ride-hailing firms engaged in lobbying activities, as evidenced by reported lobbyists, they neglected to disclose their lobbying expenditures. Moreover, as discussed earlier, corporate lobbying efforts are quantified as the number of lobbyists, because a higher count leads to the effective spread of information across various political networks and channels, as well as information redundancy, enhancing the reception of critical messages.

<sup>97</sup>Arts, Cassiman, and Gomez (2018).

<sup>98</sup>Roberts (2020).

<sup>99</sup>Clemens (2014).

<sup>100</sup>NCSL (2018).

### Moderating variables

The first moderator of this study is *legislative professionalism*. Professional legislators have more resources to devote to gathering information for policymaking. I used the Squire's Index, the most commonly adopted measurement for legislative professionalism.<sup>101</sup> The index consists of three dimensions: length of the legislative session, staff resources, and member pay. The states are scored between zero to one, with one indicating that a state legislature resembles Congress and zero indicating no resemblance whatsoever. For example, California, the highest ranked state in Squire's Index, pays its legislators nearly as much as members of Congress with annual salaries of \$116,000.27, and California's legislature meets annually with no limit on session length and has an average of 8.9 staff per member. By contrast, New Hampshire pays its members \$100 annually and only meets forty-five days a year.

The second moderator is *ride-hailing public hearing*. During those public hearings, state legislatures received testimonies and information input from various participants, not just ride-hailing firms, but also taxi firms, transportation officials, passengers, drivers, and academics. I measured it with a binary variable indicating whether a public hearing on ride-hailing issues was held in a particular state government in a given year. To obtain data on public hearings, I searched for the keywords "transportation network company" and "ride-hailing" in the archives of public hearings on the official websites of state legislative bodies in the United States. I only included legislative hearings and committee hearings that directly involved the legislative body, excluding the administrative and judicial hearings.

The third moderator is *media discussion of ride-hailing*. Local newspapers are key providers of political information.<sup>102</sup> I measured media deliberation by counting the number of local media reports discussing ride-hailing regulatory issues. I confined the search on both firms—Uber and Lyft—to the media database *Factiva*, and obtained news reports that contained the following key words: "regulation", "political," "public," "policy," "legislation," and "legal." *Factiva* allows media search by geographical locations of newspapers, so I was able to filter the local media articles published in a certain state. I then obtained the accumulated number of media reports on ride-hailing in that state in a year.

The fourth moderating variable is *countervailing taxi lobbyists*. It was measured as the number of lobbyists hired by taxi companies to influence a state government in a year. I collected the data from the National Institute of Money in State Politics, where I searched all the keywords related to taxi companies, including "taxi," "limo," and "cab."

### Control variables

I included a number of control variables. First, I controlled for other political strategies adopted by ride-hailing firms. I measured *ride-hailing petitions* (vote-based political strategy) with a dummy variable: whether ride-hailing firms called for their users to sign online petitions in a state in a year. I obtained the year in which they initiated petitions from ride-hailing firms' petition websites and the signed support shared by ride-hailing users on social media. I measured *ride-hailing campaign contributions* (money-based political strategy) as the amount of money ride-hailing firms donated to a state election in a year. The campaign contribution data were also obtained from the National Institute of Money in State Politics.

Second, I accounted for other political actions of the taxi industry and other stakeholders. To identify *taxi protests*, I searched "protest" in combination with all the taxi-related keywords in *Factiva*. I created a count variable to indicate the number of taxi protests in a state in a year. The control variable of *taxi campaign contributions* was measured as the amount of money taxi firms donated to a state election in a year. The data source was the National Institute of Money in State Politics. Similarly, I included the lobbying influence of insurance companies, which are important allies of ride-hailing companies in promoting the model policy. The following insurance companies were involved in the making and promoting of the ride-hailing model policy: Allstate, Farmers Insurance, State Farm, United Services Automobile Association, the American Insurance Association, the National Association of Mutual

<sup>101</sup>Squire (2017); Dorrell and Jansa (2022).

<sup>102</sup>Snyder and Stromberg (2010).

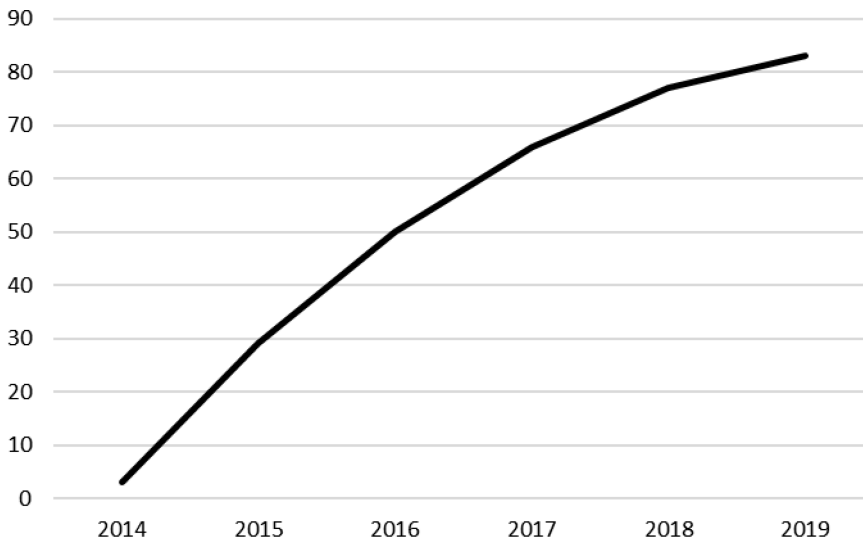


Figure 3. Cumulative enactments of ride-hailing-related laws by U.S. states.

Insurance Companies, and the Property Casualty Insurers Association of America.<sup>103</sup> I obtained their lobbying data from the National Institute of Money in State Politics.

Third, I considered the market demand for ride-hailing because ride-hailing firms may have more influence in states where they have larger markets. One proxy for market demand is the *urban population* in a state in a year, considering that ride-hailing is mainly operating in population-dense areas. The data were provided by the U.S. Census. Another proxy is the number of *cities with ride-hailing services*. I measured it with the number of cities in which ride-hailing firms have been operating in a state in a year. I obtained the list of cities in which Uber and Lyft operate from their official websites. I then searched the entry announcement for each city on both firms' websites to identify their time of entry into these cities and calculated the number of cities in which ride-hailing firms were operating in that state in a year.

Fourth, it included political alliances of ride-hailing in state legislatures. Republicans are known to be more supportive of the ride-hailing industry.<sup>104</sup> I used a binary metric to represent states where the *Republican Party control* over the governorship and held majorities in both the state senate and state house in the year. The data were provided by the Annual Book of the States from the Council of State Governments. I also controlled the *percentage of ALEC legislators* in a state legislature in a year. I acquired the roster of state lawmakers engaged with ALEC initiatives from the Centre for Media and Democracy (CMD). By examining the official webpages of state legislatures and using the Ballotpedia database for state legislators, I determined the tenure of each ALEC-affiliated legislator. Through this process, I was able to ascertain the count of ALEC legislators in a state for a specific year and computed the proportion of ALEC legislators by comparing their number to the overall quantity of state legislators.

Additionally, I considered the economic and sociodemographic features of a state, including its annual *population* and *per capita income*. I drew this data from the U.S. Census and the Bureau of Economic Analysis. Finally, I took into account the influence of policy diffusion between states, as a state government may pass ride-hailing legislations that mimic peer states. To assess this, I counted the total number of states (*diffusion*), as well as those bordering the state in question (*neighboring diffusion*), that had passed ride-hailing-related legislation by a year. Figure 3 presents the accumulated number of passed state legislations on ride-hailing.

<sup>103</sup>O'Donnell (2015).

<sup>104</sup>Buss (2014).

### *Estimation method*

Considering that both the semantic and cosine similarity scores are between 0 and 1, I used fractional regression models.<sup>105</sup> However, there is the problem of endogeneity in that unobserved variables may have simultaneously influenced ride-hailing firms' lobbying efforts and the text of ride-hailing policies. To deal with the problem, I used a two-stage Heckman regression model.<sup>106</sup> This approach is based on the nonrandom assignment of observations to the control and experimental groups. When applied to panel data, such as in this study, the model effectively addresses concerns related to time-invariant, unit-specific omitted-variable bias. I used a Probit model for the first stage, where the coefficients are used to calculate the inverse Mills ratio, which is an estimated selection hazard for the probability that ride-hailing firms are selected to engage in lobbying. Although this method does not strictly require an instrumental variable, the inclusion of an instrumental variable that affects selection but not outcomes greatly increases the robustness of the estimates.<sup>107</sup> I used lobbying by Airbnb as the instrument to estimate the probability of ride-hailing firms engaging in lobbying, considering that the homesharing and ride-hailing industries have highly overlapped markets, mainly in urban and populous areas, and both encountered regulatory challenges in 2014; meanwhile, Airbnb's lobbying has no impact on the regulatory outcome of the ride-hailing industry. In addition, the other co-variables in the first-stage models include urban population, the number of cities with ride-hailing, the Republican-controlled state legislature, the percentage of ALEC legislators, state population, and income. It shows that Airbnb lobbying is a significant predictor of ride-hailing lobbying in the first-stage model, indicating that the exclusion restrictions of the Heckman model were met.<sup>108</sup> Next, I inserted the inverse Mills ratio calculated from the first-stage model into the second-stage outcome model to estimate text similarity between passed ride-hailing policies and the model policy.

Another concern is that the text similarity score is dependent upon the enactment of a ride-hailing policy. I followed a similar procedure for Heckman selection to address this concern. First, a selection equation was used to estimate the likelihood of ride-hailing policy enactment by a state government. To establish the first stage, a variable pertaining to the power structure between local and state governments was used as an instrument: Dillon's Rule or Home Rule. In the states with Home Rule, local governments can independently issue certain policies, whereas in the states with Dillon's Rule, local governments need the state government's approval to issue policies. This variable was selected because prior research and media reports have demonstrated competition between local and state governments in regulating the ride-hailing industry.<sup>109</sup> When local governments have less regulatory power, the state government is prompted to nullify the local-level regulations by issuing state-wide policies. However, the power structure between local and state governments has no impact on the text of the passed state policies. This variable used as an exclusion restriction was also significant in the selection model. Similarly, I calculated the inverse Mills' ratio from this first-stage model for state policy enactment and inserted it into the second-stage outcome models.

## **Results**

### *Main results*

Table 1 presents descriptive statistics and bivariate correlations. Table 2 shows the Heckman selection fractional models predicting semantic text similarity between the passed ride-hailing policies and the model policy in a state in a year. Model 1 only includes the control variables. It indicates that taxi protests can discourage the adoption of the ride-hailing model policy by state legislatures, while the lobbyists hired by insurance companies, the allies of ride-hailing companies, can encourage it. Model 2 adds the independent variable of ride-hailing lobbyists. In the baseline hypothesis, I proposed a direct

<sup>105</sup>Ramalho, Ramalho, and Murteira (2011).

<sup>106</sup>Heckman (1979).

<sup>107</sup>Sartori (2003).

<sup>108</sup>Bascle (2008).

<sup>109</sup>Wen and Yue (2021); Collier, Dubal and Carter (2018).

**Table 1:** Descriptive statistics

Variables	Mean	S.D.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1. Semantic text similarity	0.21	0.31																			
2. Cosine text similarity	0.21	0.31	0.99																		
3. Ride-hailing lobbyists number	10.54	14.98	0.16	0.19																	
4. Legis. professionalism (Squire score)	0.22	0.10	0.10	0.14	0.50																
5. Public hearing	0.13	0.34	0.37	0.36	0.21	0.03															
6. Media discussion (×1000)	0.07	0.22	0.08	0.13	0.41	0.61	−0.02														
7. Taxi lobbyist number	3.53	11.16	0.06	0.08	0.82	0.41	0.26	0.29													
8. Ride-hailing petition	0.12	0.33	0.18	0.17	0.08	0.16	0.29	−0.07	0.17												
9. Ride-hailing camp. donation (×1000)	3.98	21.36	0.06	0.09	0.20	0.32	−0.06	0.48	0.02	−0.06											
10. Urban population (×1million)	4.99	6.03	0.13	0.17	0.69	0.69	0.04	0.67	0.43	0.08	0.42										
11. Cities with ride-hailing	4.80	4.06	0.00	0.03	0.29	0.37	−0.12	0.39	0.04	−0.08	0.25	0.70									
12. Taxi protest	0.18	0.72	0.00	0.01	0.42	0.28	0.10	0.06	0.47	0.36	0.00	0.42	0.16								
13. Taxi camp. donation (×1000)	2.06	10.00	0.07	0.11	0.14	0.21	0.00	0.19	0.08	−0.05	0.39	0.36	0.22	0.11							
14. Insurance lobbyist number	0.07	0.35	0.17	0.18	0.42	0.31	0.19	0.23	0.36	0.13	0.12	0.45	0.19	0.43	0.09						
15. Republican-controlled legislature	0.48	0.50	−0.05	−0.05	−0.18	−0.30	−0.02	−0.09	−0.15	−0.09	−0.11	−0.06	0.11	−0.08	−0.10	−0.06					
16. % ALEC legislators	0.19	0.14	0.01	−0.01	−0.10	−0.10	0.07	−0.07	−0.15	0.02	−0.12	0.11	0.35	−0.03	−0.04	0.01	0.56				
17. Population (×1million)	6.48	7.25	0.12	0.17	0.65	0.67	0.03	0.66	0.40	0.07	0.42	1.00	0.74	0.40	0.36	0.43	−0.03	0.15			
18. Per capita income (×1000)	50.56	8.38	−0.05	−0.03	0.33	0.40	0.04	0.27	0.28	−0.08	0.17	0.25	−0.04	0.08	0.10	0.05	−0.43	−0.36	0.19		
19. Diffusion	30.40	6.63	−0.27	−0.25	0.03	0.00	−0.47	0.17	−0.04	−0.55	0.09	0.00	0.19	−0.24	0.04	−0.12	0.01	−0.06	0.01	0.23	
20. Neighboring state diffusion	3.64	1.97	−0.12	−0.11	−0.06	−0.22	−0.18	−0.04	−0.04	−0.23	−0.08	−0.11	0.07	−0.17	0.00	−0.04	0.41	0.41	−0.07	−0.28	0.31

N = 250.

**Table 2:** Heckman selection (fractional) models for semantic text similarity between the passed ride-hailing state policies and the ride-hailing model policy

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	semantic	semantic	semantic	semantic	semantic	semantic	semantic	semantic	semantic	semantic
Ride-hailing petition	0.212 (0.255)	0.225 (0.253)	0.232 (0.252)	0.151 (0.256)	0.181 (0.254)	0.235 (0.256)	0.224 (0.253)	0.210 (0.254)	0.288 (0.246)	0.222 (0.256)
Ride-hailing campaign contributions	-0.001 (0.002)	-0.000 (0.002)	-0.000 (0.002)	-0.001 (0.002)	-0.000 (0.002)	-0.003 (0.002)	-0.001 (0.002)	-0.001 (0.002)	-0.002 (0.002)	-0.002 (0.002)
Urban population	0.152 (0.169)	-0.018 (0.188)	-0.017 (0.189)	-0.174 (0.200)	0.065 (0.194)	-0.291 (0.223)	-0.018 (0.189)	-0.243 (0.210)	-0.142 (0.210)	-0.387 (0.222)
Cities with ride-hailing	0.041 (0.054)	0.029 (0.053)	0.028 (0.054)	-0.023 (0.059)	0.025 (0.053)	-0.041 (0.059)	0.032 (0.054)	-0.018 (0.057)	-0.012 (0.058)	-0.050 (0.058)
Taxi protest	-0.387* (0.156)	-0.409** (0.153)	-0.413** (0.154)	-0.479** (0.186)	-0.390** (0.150)	-0.538*** (0.152)	-0.395* (0.164)	-0.535** (0.199)	-0.428* (0.180)	-0.532* (0.208)
Taxi campaign contribution	0.006 (0.005)	0.008 (0.005)	0.008 (0.005)	0.011 (0.006)	0.006 (0.006)	0.011 (0.006)	0.009 (0.006)	0.010 (0.006)	0.010 (0.006)	0.012* (0.006)
Insurance lobbyists	0.379** (0.142)	0.344* (0.152)	0.347* (0.152)	0.474** (0.179)	0.268 (0.168)	0.584*** (0.167)	0.348* (0.152)	0.443** (0.157)	0.400* (0.155)	0.594** (0.184)
Republican-controlled legislature	0.094 (0.245)	0.034 (0.245)	0.031 (0.246)	-0.045 (0.248)	-0.009 (0.240)	-0.073 (0.248)	0.038 (0.244)	-0.056 (0.246)	0.018 (0.249)	-0.034 (0.250)
% ALEC legislators	0.012 (0.765)	0.253 (0.762)	0.252 (0.766)	-0.363 (0.803)	-0.132 (0.779)	0.038 (0.823)	0.294 (0.758)	-0.057 (0.804)	0.233 (0.766)	0.270 (0.779)

(Continued)

**Table 2:** (Continued)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	semantic	semantic	semantic	semantic	semantic	semantic	semantic	semantic	semantic	semantic
Population	-0.145 (0.150)	-0.012 (0.163)	-0.011 (0.163)	0.150 (0.177)	-0.061 (0.168)	0.234 (0.193)	-0.017 (0.161)	0.189 (0.182)	0.101 (0.181)	0.299 (0.188)
Income	0.001 (0.014)	-0.004 (0.015)	-0.004 (0.015)	-0.012 (0.016)	-0.013 (0.015)	-0.017 (0.015)	-0.004 (0.015)	-0.010 (0.015)	-0.006 (0.015)	-0.010 (0.015)
Diffusion	-0.031 (0.014)	-0.031 (0.014)	-0.031 (0.014)	-0.033 (0.014)	-0.014 (0.015)	-0.007 (0.014)	-0.032 (0.014)	-0.035 (0.014)	-0.032 (0.014)	-0.029 (0.015)
Neighboring state diffusion	-0.046 (0.048)	-0.072 (0.049)	-0.073 (0.049)	-0.059 (0.049)	-0.050 (0.050)	-0.054 (0.051)	-0.073 (0.049)	-0.077 (0.050)	-0.072 (0.051)	-0.089 (0.051)
Ride-hailing lobbyists		0.015* (0.007)	0.015* (0.007)	0.062** (0.024)	0.007 (0.008)	0.054*** (0.015)	0.016* (0.007)	0.041** (0.013)	0.039** (0.012)	0.062*** (0.014)
Legis. professionalism			-0.183 (1.154)	1.618 (1.490)						
Lobbyist×professionalism				-0.125* (0.062)						
Public hearing					0.722** (0.228)	1.327*** (0.264)				
Lobbyist× public hearing						-0.050*** (0.013)				
Media discussion							0.141 (0.418)	1.525* (0.778)		

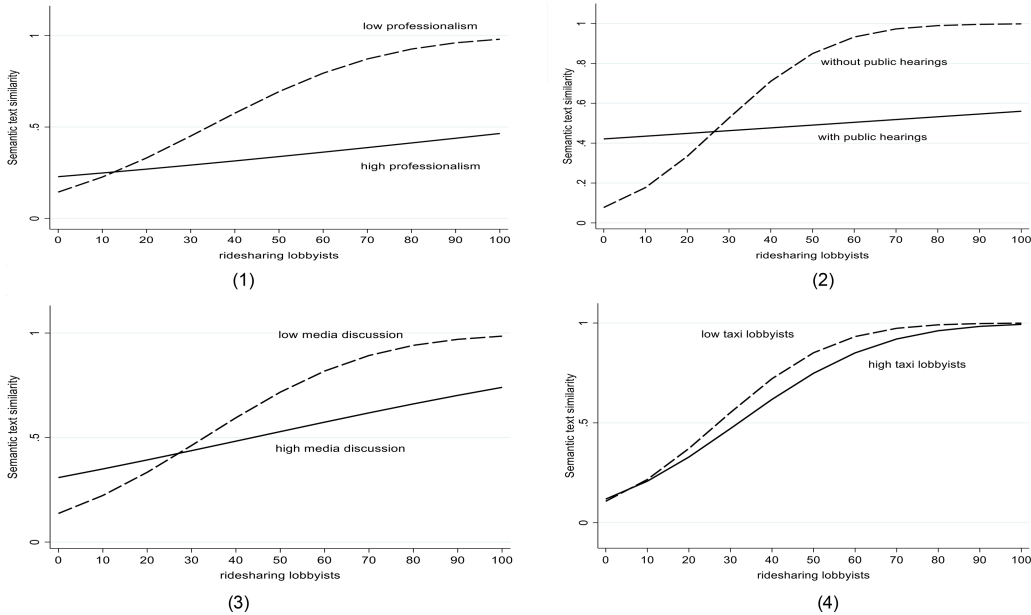
(Continued)



Table 2: (Continued)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	semantic	semantic	semantic	semantic	semantic	semantic	semantic	semantic	semantic	semantic
Lobbyist × media								−0.056*		
								(0.024)		
Taxi lobbyists									−0.032*	0.014
									(0.013)	(0.026)
Ride-hailing lobbyists × Taxi lobbyists										−0.001*
										(0.000)
IMR (lobbying)	0.038	0.238	0.229	0.750	0.116	0.411	0.215	0.656	0.374	0.702
	(0.368)	(0.393)	(0.399)	(0.454)	(0.399)	(0.422)	(0.390)	(0.423)	(0.397)	(0.409)
IMR (policy enactment)	−1.127	−0.868	−0.876	−0.555	−0.698	−0.157	−0.871	−0.442	−0.597	−0.270
	(0.642)	(0.652)	(0.656)	(0.659)	(0.650)	(0.716)	(0.650)	(0.666)	(0.661)	(0.672)
Constant	1.398	1.315	1.334	0.926	0.994	0.024	1.331	1.067	0.995	0.585
	(0.757)	(0.770)	(0.778)	(0.818)	(0.774)	(0.836)	(0.775)	(0.788)	(0.784)	(0.819)
Log likelihood	−116.7	−115.6	−115.5	−114.5	−112.9	−108.4	−115.5	−114.1	−113.8	−111.9

*N* = 250. Standard errors of state and year are clustered; s.e in parentheses; Significance level: +<0.10, \*<0.05, \*\*<0.01, \*\*\*<0.001.



**Figure 4.** Interaction plots.

Note: “low” in the graphs presents that the moderator is at the mean level; “high” in the graphs means that the moderator is at two standard deviations above the mean.

positive impact of firm lobbying on policymakers’ adoption of information provided by firms in policymaking. In Model 2, the coefficient of the number of lobbyists hired by ride-hailing firms is significant ( $\beta = 0.015, p = 0.034$ ), meaning that corporate lobbying efforts are positively associated with policymakers’ information intake. The baseline hypothesis is thus supported.

Model 3 and Model 4 in Table 2 examine the interaction effect with legislative professionalism. The negative and significant coefficient for the interaction term ( $\beta = -0.125, p = 0.042$ ) suggests that the positive relationship between corporate lobbying and the adoption of the model policy diminished with higher legislative professionalism. It thus lends support to Hypothesis 1. Further analysis shows that when legislative professionalism is high (mean + 2SD), two standard deviations increase in the number of ride-hailing lobbyists from the mean would increase the semantic text similarity between the passed ride-hailing policies and the model policy by 29 percent, in contrast to 152 percent for low legislative professionalism (mean). The interaction plot is presented in Figure 4(1).

Model 5 and Model 6 test the moderating effect of information deliberation with other stakeholders in public hearings. The results indicate that the ride-hailing lobbying strategy can only greatly increase semantic text similarity between the passed ride-hailing policies and the model policy without the presence of public hearings at state legislatures ( $\beta = -0.005, p = 0.000$ ). It thus provides evidence for Hypothesis 2a. Specifically, an increase in the number of ride-hailing lobbyists from the mean to two standard deviations above the mean results in a 294 percent increase in the semantic text similarity without the presence of public hearings, whereas it only leads to 9 percent increase with public hearings. Figure 4 (2) presents its interaction plot.

Model 7 and Model 8 examine the interaction impact of information deliberation in the media, using the proxy of the number of media articles discussing regulatory issues of ride-hailing in a state by a year. The results are consistent with Hypothesis 2b, showing that the positive relationship between corporate lobbying and the adoption of the ride-hailing model policy by state legislatures is attenuated by media discussion on the issue ( $\beta = -0.056, p = 0.018$ ). It means that an increase in the ride-hailing lobbyist number from the mean to two standard deviation deviations above the mean increases semantic text similarity by 38 percent for the high volume of media discussion of the ride-hailing issue(mean + 2SD), compared to 172 percent for the low media coverage volume (mean). Figure 4(3) displays the moderating impact.

Similarly, Model 9 and Model 10 summarize the moderating impact of the countervailing force, which was measured with the number of lobbyists hired by incumbent taxi companies. The result confirms Hypothesis 3 that the countervailing taxi lobbyists weakened the positive relationship between ride-hailing lobbyists and the adoption of the ride-hailing mode policy ( $\beta = -0.001$ ,  $p = 0.020$ ). However, as shown by Figure 4(4), its moderating impact is relatively weak compared to the other three moderators. When the number of taxi lobbyists is high (mean + 2SD), two standard deviations increase in the number of ride-hailing lobbyists from the mean would increase the semantic text similarity by 195 percent, compared to 227 percent for low taxi lobbyist number (mean).

Table 3 presents the Heckman fractional models for cosine text similarity between the passed ride-hailing policies and the model policy. The results are consistent with those obtained from semantic scores.

Hence, although corporate lobbying efforts can facilitate policymakers adopting information they provide, its impact is highly contingent upon information asymmetry between policymakers and corporations. Specifically, such information asymmetry can be attributed to the extent to which policymakers are constrained by resources to gather their own information, the level of information deliberation, and the strength of countervailing forces.

### *Additional analyses and robustness checks*

I also conducted additional analyses and checked the robustness of the findings. First, Models 1–8 tested whether the four variables regarding information asymmetry moderated the impact of corporate petitions and campaign contributions, which are another two major CPAs of ride-hailing firms. The insignificant coefficients for the interaction terms indicate that information asymmetry only moderates the impact of information-based strategies but not money-based strategies and vote-based strategies. Second, I employed an alternative instrument to mitigate the endogeneity concerns. Here I used the reverse of *the strictness of lobbying rules* as the alternative instrument, as companies are expected to refrain from lobbying efforts if the lobbying rules of a state are strict; meanwhile, strictness of lobbying rules has no direct influence on the text of ride-hailing laws. The data were obtained from OpenSecrets, a nonprofit research group that tracks the effects of money and lobbying on public policy in the United States. It scored each state by (1) whether lobbyist compensation is disclosed, (2) the quality of disclosure of lobbyist and client identities, (3) the timeliness of disclosure, and (4) how easily the public can access disclosed information. Models 9–12 suggest that all the results remained with the alternative instrument. Third, I delved deeper into the content of the model policy by examining whether corporate lobbying is associated with policymakers' adoption of the ride-hailing insurance model—a key element of the ride-hailing model policy. The insurance model clarified the insurance amounts in different periods of the ride-hailing service: During Period 1 (driver logged in), primary insurance with limits of \$50/\$100/\$25 is required, maintained by the TNC, driver, or both. For Periods 2 and 3 (en route and carrying passengers), a \$1,000,000 liability coverage, akin to limo standards, is mandated, and upheld by the TNC, driver, or a combination thereof. I adopted a dummy variable to capture the adoption of the insurance model proposed by ride-hailing. Models 13–16 indicate that all the hypotheses on corporate lobbying are still supported (Table 4).

### **Conclusion and discussion**

This paper examined the effectiveness of lobbying in delivering information, represented as the extent to which and the conditions under which policymakers incorporate information delivered via firm lobbying into policy outcomes. This paper argues that the informational influence of lobbying is moderated by the information asymmetry between policymakers and firms. I find general support for this argument in an empirical study of the adoption of the ride-hailing model policy by U.S. state legislatures. To capture whether state legislatures adopt the model policy, I conducted cosine and semantic text similarity analyses between all ride-hailing policies passed by U.S. state legislatures and the model policy lobbied by ride-hailing firms. The results show that the effectiveness of corporate

**Table 3:** Heckman selection (fractional) models for cosine text similarity between the passed ride-hailing state policies and the ride-hailing model policy

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	cosine	cosine	cosine	cosine	cosine	cosine	cosine	cosine	cosine	cosine
Ride-hailing petition	0.194 (0.250)	0.207 (0.248)	0.207 (0.248)	0.130 (0.251)	0.165 (0.248)	0.213 (0.249)	0.205 (0.247)	0.191 (0.248)	0.269 (0.241)	0.201 (0.251)
Ride-hailing campaign contributions	-0.001 (0.002)	-0.000 (0.002)	-0.000 (0.002)	-0.001 (0.002)	-0.000 (0.002)	-0.003 (0.002)	-0.001 (0.002)	-0.001 (0.003)	-0.002 (0.002)	-0.002 (0.002)
Urban population	0.139 (0.169)	-0.039 (0.187)	-0.039 (0.188)	-0.194 (0.200)	0.039 (0.193)	-0.314 (0.223)	-0.038 (0.188)	-0.272 (0.210)	-0.161 (0.208)	-0.412 (0.221)
Cities with ride-hailing	0.027 (0.053)	0.013 (0.053)	0.013 (0.053)	-0.037 (0.059)	0.009 (0.053)	-0.059 (0.058)	0.019 (0.053)	-0.033 (0.056)	-0.027 (0.057)	-0.066 (0.057)
Taxi protest	-0.389** (0.148)	-0.412** (0.146)	-0.412** (0.146)	-0.475** (0.171)	-0.388** (0.143)	-0.541*** (0.149)	-0.384* (0.152)	-0.532** (0.184)	-0.427* (0.169)	-0.538** (0.195)
Taxi campaign contribution	0.007 (0.006)	0.009 (0.006)	0.009 (0.006)	0.011 (0.006)	0.007 (0.006)	0.011 (0.006)	0.010 (0.006)	0.011 (0.006)	0.011 (0.006)	0.013* (0.006)
Insurance lobbyist	0.329* (0.143)	0.298* (0.146)	0.298* (0.147)	0.420* (0.173)	0.220 (0.164)	0.524** (0.170)	0.305* (0.146)	0.401** (0.150)	0.348* (0.150)	0.547** (0.178)
Republican-controlled legislature	0.081 (0.245)	0.018 (0.245)	0.018 (0.245)	-0.059 (0.246)	-0.027 (0.240)	-0.099 (0.248)	0.026 (0.243)	-0.074 (0.244)	0.001 (0.249)	-0.058 (0.248)
% ALEC legislators	-0.183 (0.768)	0.068 (0.763)	0.068 (0.764)	-0.524 (0.813)	-0.300 (0.781)	-0.144 (0.827)	0.153 (0.754)	-0.208 (0.807)	0.051 (0.769)	0.083 (0.783)

(Continued)

Table 3: (Continued)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	cosine	cosine	cosine	cosine	cosine	cosine	cosine	cosine	cosine	cosine
Population	-0.117	0.022	0.022	0.181	-0.023	0.272	0.011	0.226	0.133	0.338
	(0.149)	(0.162)	(0.161)	(0.177)	(0.167)	(0.192)	(0.160)	(0.181)	(0.178)	(0.187)
Income	-0.000	-0.006	-0.006	-0.014	-0.015	-0.019	-0.005	-0.012	-0.007	-0.012
	(0.015)	(0.015)	(0.016)	(0.016)	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)
Diffusion	-0.030	-0.031	-0.031	-0.032	-0.014	-0.007	-0.032	-0.035	-0.031	-0.029
	(0.014)	(0.014)	(0.014)	(0.014)	(0.015)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)
Neighboring state diffusion	-0.032	-0.059	-0.059	-0.045	-0.037	-0.040	-0.061	-0.065	-0.059	-0.075
	(0.048)	(0.049)	(0.049)	(0.048)	(0.050)	(0.051)	(0.049)	(0.049)	(0.050)	(0.050)
Ride-hailing lobbyists		0.016*	0.016*	0.062*	0.008	0.054***	0.016*	0.043***	0.039**	0.062***
		(0.008)	(0.008)	(0.024)	(0.008)	(0.015)	(0.008)	(0.013)	(0.012)	(0.014)
Legis. professionalism			0.003	1.746						
			(1.160)	(1.502)						
Lobbyist×professionalism				-0.121+						
				(0.063)						
Public hearing					0.699**	1.298***				
					(0.224)	(0.258)				
Lobbyist× public hearing						-0.049***				
						(0.013)				

(Continued)

**Table 3:** (Continued)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	cosine	cosine	cosine	cosine	cosine	cosine	cosine	cosine	cosine	cosine
Media discussion							0.280	1.693*		
							(0.430)	(0.798)		
Lobbyist × media								−0.057*		
								(0.024)		
Taxi lobbyists									−0.031*	0.016
									(0.013)	(0.026)
Ride-hailing lobbyists × Taxi lobbyists										−0.001*
										(0.000)
IMR(lobbying)	0.036	0.241	0.241	0.750	0.123	0.413	0.193	0.653	0.372	0.711
	(0.357)	(0.382)	(0.389)	(0.444)	(0.383)	(0.400)	(0.378)	(0.409)	(0.385)	(0.396)
IMR (policy enactment)	−0.956	−0.679	−0.679	−0.368	−0.508	0.060	−0.685	−0.236	−0.411	−0.065
	(0.631)	(0.640)	(0.642)	(0.647)	(0.639)	(0.703)	(0.638)	(0.657)	(0.652)	(0.663)
Constant	1.213	1.121	1.121	0.722	0.803	−0.165	1.152	0.879	0.805	0.377
	(0.757)	(0.769)	(0.774)	(0.816)	(0.776)	(0.841)	(0.775)	(0.789)	(0.785)	(0.823)
Log likelihood	−116.6	−115.4	−115.4	−114.4	−112.9	−108.5	−115.3	−113.8	−113.8	−111.8

N = 250. Standard errors of state and year are clustered; s.e in parentheses; Significance level: +<0.10, \*<0.05, \*\*<0.01, \*\*\*<0.001.

**Table 4:** Additional analyses and robustness checks

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Interaction with petitions and campaign donations								
Urban population	-0.029 (0.189)	0.005 (0.193)	0.091 (0.195)	0.062 (0.195)	-0.019 (0.189)	-0.007 (0.194)	-0.091 (0.208)	-0.143 (0.210)
Cities with ride-hailing	0.030 (0.053)	0.033 (0.054)	0.039 (0.054)	0.025 (0.053)	0.032 (0.054)	0.033 (0.054)	0.000 (0.057)	-0.010 (0.058)
Taxi protest	-0.354* (0.173)	-0.410** (0.154)	-0.401** (0.147)	-0.382** (0.148)	-0.408 (0.211)	-0.398* (0.166)	-0.291 (0.207)	-0.425* (0.181)
Taxi campaign contribution	0.008 (0.006)	0.007 (0.006)	0.006 (0.006)	0.006 (0.006)	0.009 (0.006)	0.009 (0.006)	0.009 (0.006)	0.009 (0.008)
Insurance lobbyist	0.265 (0.155)	0.336* (0.154)	0.273 (0.162)	0.275 (0.163)	0.358* (0.180)	0.335* (0.156)	0.260 (0.192)	0.407** (0.156)
Republican-controlled legislature	0.054 (0.244)	0.035 (0.246)	0.013 (0.237)	-0.016 (0.242)	0.037 (0.244)	0.039 (0.244)	0.039 (0.246)	0.019 (0.249)
% ALEC legislators	0.396 (0.747)	0.268 (0.767)	-0.130 (0.792)	-0.106 (0.781)	0.296 (0.757)	0.274 (0.762)	0.254 (0.780)	0.247 (0.767)
Population	-0.008 (0.162)	-0.032 (0.167)	-0.089 (0.169)	-0.059 (0.169)	-0.017 (0.161)	-0.026 (0.165)	0.056 (0.179)	0.099 (0.181)
Income	-0.000 (0.015)	-0.003 (0.015)	-0.013 (0.015)	-0.013 (0.015)	-0.004 (0.015)	-0.004 (0.015)	-0.004 (0.015)	-0.005 (0.015)
Diffusion	-0.030* (0.014)	-0.031* (0.014)	-0.011 (0.015)	-0.013 (0.015)	-0.032* (0.015)	-0.032* (0.014)	-0.030* (0.014)	-0.032* (0.014)
Neighboring state diffusion	-0.085 (0.051)	-0.072 (0.050)	-0.054 (0.050)	-0.048 (0.050)	-0.073 (0.049)	-0.072 (0.049)	-0.076 (0.051)	-0.070 (0.051)

(Continued)

**Table 4:** (Continued)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Ride-hailing lobbyists	0.015*	0.016*	0.006	0.007	0.016*	0.016*	0.034**	0.040***
	(0.007)	(0.007)	(0.008)	(0.008)	(0.007)	(0.007)	(0.013)	(0.012)
Ride-hailing petition	1.255	0.230	0.449	0.180	0.204	0.221	0.499	0.288
	(0.715)	(0.252)	(0.321)	(0.254)	(0.278)	(0.253)	(0.264)	(0.246)
Ride-hailing campaign contribution	-0.000	-0.007	-0.000	-0.000	-0.001	-0.002	-0.002	-0.004
	(0.002)	(0.011)	(0.002)	(0.002)	(0.002)	(0.006)	(0.002)	(0.004)
Legis professionalism	0.430	-0.281						
	(1.169)	(1.166)						
Public hearing			0.921***	0.742**				
			(0.255)	(0.241)				
Media discussion					0.139	0.083		
					(0.420)	(0.464)		
Taxi lobbyists							-0.024	-0.033**
							(0.013)	(0.013)
Petition × professionalism	-4.166							
	(3.073)							
Campaign contribution × professionalism		0.013						
		(0.018)						
Petition × public hearing			-0.631					
			(0.442)					
Campaign contribution × Public hearing				-0.021				
				(0.065)				
Petition × media					0.867			
					(6.881)			
Campaign contribution × media						0.001		
						(0.003)		

(Continued)



**Table 4:** (Continued)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Petition × taxi lobbyists							-0.054	
							(0.029)	
Campaign contribution × taxi lobbyists								0.000
								(0.001)
IMR (lobbying)	0.212	0.191	0.154	0.110	0.220	0.214	0.326	0.358
	(0.398)	(0.403)	(0.397)	(0.400)	(0.390)	(0.390)	(0.398)	(0.398)
IMR (policy enactment)	-0.914	-0.893	-0.778	-0.707	-0.880	-0.879	-0.756	-0.615
	(0.667)	(0.654)	(0.652)	(0.651)	(0.652)	(0.650)	(0.663)	(0.662)
Constant	1.082	1.354	0.924	0.983	1.355	1.344	1.079	0.969
	(0.784)	(0.777)	(0.777)	(0.774)	(0.776)	(0.774)	(0.790)	(0.787)
Log likelihood	-114.7	-115.4	-112.3	-112.8	-115.5	-115.5	-113.0	-113.8
	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
	An alternative instrument				Dummy DV: The adoption of the insurance model			
Ride-hailing petition	0.153	0.237	0.214	0.225	0.234*	0.318*	0.124*	0.394*
	(0.258)	(0.257)	(0.255)	(0.257)	(0.502)	(0.448)	(0.441)	(0.437)
Ride-hailing campaign contributions	-0.001	-0.003	-0.001	-0.002	-0.057	-0.056	-0.045*	-0.077
	(0.002)	(0.002)	(0.002)	(0.002)	(0.031)	(0.032)	(0.020)	(0.040)
Urban population	-0.173	-0.295	-0.236	-0.367	0.422	0.382	-0.033	0.439
	(0.200)	(0.223)	(0.209)	(0.220)	(0.320)	(0.301)	(0.326)	(0.340)
Cities with ride-hailing	-0.017	-0.038	-0.012	-0.042	-0.241**	-0.188**	-0.271***	-0.211**
	(0.059)	(0.060)	(0.057)	(0.058)	(0.076)	(0.070)	(0.079)	(0.082)
Taxi protest	-0.480*	-0.540***	-0.535**	-0.530*	-0.338	-0.289	-0.473	-0.039
	(0.188)	(0.152)	(0.202)	(0.209)	(0.368)	(0.198)	(0.323)	(0.326)

(Continued)

**Table 4:** (Continued)

	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
	An alternative instrument				Dummy DV: The adoption of the insurance model			
Taxi campaign contribution	0.010	0.010	0.009	0.012*	0.016	0.023	0.024	0.026
	(0.006)	(0.006)	(0.006)	(0.006)	(0.016)	(0.016)	(0.016)	(0.016)
Insurance lobbyist	0.470**	0.581***	0.439**	0.587**	-0.117	-0.328	-0.038	-0.451
	(0.180)	(0.168)	(0.158)	(0.185)	(0.424)	(0.376)	(0.406)	(0.451)
Republican-controlled legislature	-0.037	-0.074	-0.046	-0.016	-0.428	-0.330	-0.563	-0.272
	(0.247)	(0.247)	(0.244)	(0.249)	(0.356)	(0.359)	(0.358)	(0.367)
% ALEC legislators	-0.376	0.027	-0.065	0.263	1.156	1.657	0.779	1.563
	(0.802)	(0.824)	(0.805)	(0.779)	(1.191)	(1.057)	(1.237)	(1.108)
Population	0.146	0.235	0.180	0.279	-0.151	-0.192	0.217	-0.228
	(0.175)	(0.193)	(0.181)	(0.186)	(0.284)	(0.263)	(0.301)	(0.298)
Income	-0.011	-0.017	-0.009	-0.008	-0.028	-0.039	-0.052*	-0.032
	(0.016)	(0.015)	(0.015)	(0.015)	(0.019)	(0.021)	(0.020)	(0.020)
Diffusion	-0.032*	-0.007	-0.034*	-0.029	0.020	0.040	0.015	0.016
	(0.014)	(0.014)	(0.014)	(0.015)	(0.022)	(0.026)	(0.023)	(0.023)
Neighboring state diffusion	-0.061	-0.056	-0.079	-0.091	0.250***	0.230***	0.209***	0.264***
	(0.049)	(0.051)	(0.050)	(0.051)	(0.069)	(0.067)	(0.063)	(0.071)
Ride-hailing lobbyists	0.062**	0.054***	0.040**	0.060***	0.074	0.013	0.049*	0.033
	(0.024)	(0.014)	(0.012)	(0.013)	(0.041)	(0.018)	(0.025)	(0.023)
Legis. professionalism	1.678				-1.317			
	(1.488)				(2.242)			
Lobbyist×professionalism	-0.125*				-0.261*			
	(0.061)				(0.125)			

(Continued)

**Table 4:** (Continued)

	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
		An alternative instrument				Dummy DV: The adoption of the insurance model		
Public hearing		1.326***				1.093*		
		(0.264)				(0.461)		
Lobbyist × public hearing		−0.050***				−0.039*		
		(0.013)				(0.016)		
Media discussion			1.472				3.718**	
			(0.768)				(1.155)	
Lobbyist × media			−0.055*				−0.202**	
			(0.024)				(0.074)	
Taxi lobbyists				0.014				−0.105*
				(0.026)				(0.042)
Ride-hailing lobbyists × taxi lobbyists				−0.001*				−0.000+
				(0.000)				(0.001)
IMR (lobbying)	0.811	0.472	0.686	0.688				
Alternative instrument	(0.486)	(0.442)	(0.452)	(0.431)				
IMR (policy enactment)	−0.671	−0.221	−0.550	−0.394	1.376	1.320	2.020*	1.322
	(0.657)	(0.716)	(0.665)	(0.674)	(0.933)	(0.924)	(0.972)	(0.941)
IMR (lobbying)					−2.760***	−3.113***	−1.396	−2.821***
					(0.818)	(0.762)	(0.788)	(0.761)
Constant	0.995	0.071	1.134	0.667	−2.229	−2.490	−2.157	−2.155
	(0.818)	(0.838)	(0.789)	(0.819)	(1.277)	(1.319)	(1.237)	(1.216)
Log likelihood	−114.3	−108.3	−114.0	−111.9	−83.63	−87.86	−84.56	−83.03

N = 250. Standard errors of state and year are clustered; s.e in parentheses; Significance level: +<0.10, \*<0.05, \*\*<0.01, \*\*\*<0.001.

lobbying in conveying information hinges on the degree of information asymmetry between firms and policymakers, which is the result of (1) policymakers' resources to gather information, (2) information deliberation through public hearings or the media, and (3) the countervailing lobbying efforts. Normatively, the study illuminates the necessity for policymakers to possess sufficient resources for independent information acquisition and champions a balanced approach to lobbying. It suggests that a pluralistic system that incorporates diverse perspectives can foster more equitable and representative policy results.

This study contributes to the CPA literature in a few ways. First, the existing body of research on lobbying has concentrated on its material facets, with particular focus on corporate expenditure on lobbying activities and the material benefits that ensue, such as increases in equity returns, stock market valuations, tax advantages, and government contracts.<sup>110</sup> Despite this focus, a subset of literature has emerged advocating an informational perspective of lobbying, underscoring the strategic transmission of information as a pivotal element of the interactions between corporate lobbyists and politicians,<sup>111</sup> as well as the nature of the information exchanged.<sup>112</sup> However, this perspective has not sufficiently explored how effectively information from firm lobbying is integrated into resulting policy decisions. This study is the first attempt to examine the extent to which and under what conditions lobbying can effectively deliver information to politicians.

Relatedly, while the theoretical basis of this informational perspective on lobbying is well-established, its empirical progress has long been hindered by a scarcity of data.<sup>113</sup> This challenge stems not only from the fact that firm lobbying takes place through private meetings and in a covert manner but also from the inherent difficulty in quantifying and measuring information.<sup>114</sup> This study lifts the restrictions by leveraging unique data on the adoption of the ride-hailing model policy by U.S. state legislatures. On the one hand, the content of the ride-hailing model policy, which is also the information delivered by ride-hailing firms to policymakers, is disclosed. On the other hand, most U.S. state legislatures have enacted policies on ride-hailing. It follows that an analysis of the overlap between the enacted policy and the model policy enables us to quantify the information adopted by policymakers.

Third, it joins the emerging stream of CPA literature that focuses on the supply side of the political market and the heterogeneity of politicians' receptivity to CPAs.<sup>115</sup> Prior research has either emphasized the influence of the hard characteristics of policy suppliers, including political competition and electoral competition,<sup>116</sup> or their soft characteristics, such as political ideology.<sup>117</sup> This study contributes to this emerging CPA research stream by highlighting the influence of information asymmetry between policy suppliers and demanders and showing a nuanced picture that it only moderates the effectiveness of lobbying but not the constituency-building and campaign contribution strategies.

There are limitations to its findings. Firstly, this study is based on the special data on model policies being lobbied by firms. Yet, information input from firms can take various forms, such as statistics, facts, arguments, forecasts, threats, and signals.<sup>118</sup> Further research can explore and compare the effectiveness of different types of information input in influencing policy outcomes. Second, this paper only includes registered lobbyists. However, as pointed out by Thomas and LaPira, there are also "shadow lobbyists"—these are paid professionals in a gray market for lobbying services.<sup>119</sup> Should data permit, future research could shed light on the influence and dynamics of these informal lobbying

<sup>110</sup>e.g. Ridge et al. (2017); Kim (2019).

<sup>111</sup>e.g. Albareda et al.(2023); Bouwen (2002).

<sup>112</sup>e.g. De Bruycker (2016).

<sup>113</sup>Bombardini and Trebbi (2020).

<sup>114</sup>Kluver (2012); Nothhaft (2017).

<sup>115</sup>McDonnell and Werner (2016); Uzuca, Rightering, and Ozcan (2018).

<sup>116</sup>Choi et al. (2015).

<sup>117</sup>Wang et al. (2019).

<sup>118</sup>de Figueiredo (2002).

<sup>119</sup>Thomas and LaPira (2017).

activities. Third, this paper focuses on a specific issue and industry, and future research can extend generalizability by testing the results across multiple issues and industries, such as innovative industries versus conventional industries<sup>120</sup> and salient issues versus non-salient issues.<sup>121</sup> It is possible that policymakers' information dependency on firms is greater for innovative industries and non-salient issues, which are less known and understood by outsiders, than for conventional industries and salient issues.

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<sup>120</sup>Bolter and Holmquist (1996).

<sup>121</sup>Bonardi and Keim (2005).

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