Disloyal managers and shareholders' wealth[*]

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Abstract

The prohibition against fiduciaries appropriating business opportunities from their companies is a fundamental part of the duty of loyalty, the expectation of which is integral to U.S. corporate governance. However, starting in 2000, several states, including Delaware, allowed boards to waive this duty. Exploiting the staggered passage of waiver laws, we show that this weakening of fiduciary duty has significantly decreased public firms' investment in innovation. Firms covered by waiver laws invest less in R&D, produce fewer and less valuable patents and exhibit abnormally high inventor departures. Remaining innovation activities contribute less to firm value, a fact confirmed by the market reaction when firms reveal their curtailed internal growth opportunities by announcing acquisitions. Consistent with the laws' intent to provide contracting flexibility to emerging firms, we do find evidence of positive impacts for small firms.

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1. Introduction

Agency conflicts arise when managers' interests depart from those of shareholders. Shareholders expect managers to have a fiduciary duty to subordinate their personal interests to those of shareholders, and in particular, not to take new business opportunities for themselves rather than giving them to the corporation. For the vast majority of the history of corporate law, shareholders would have been correct in this presumption. But starting in 2000 with Delaware, states changed the law to allow boards to waive this so-called duty of loyalty. These corporate opportunity waivers explicitly allow managers to ignore the duty of loyalty when in the course of their employment, they discover new business opportunities.

One might wonder why states would allow, and boards would adopt, waivers to the duty of loyalty. Courts had noted that absolute prohibitions of waivers left firms, especially small ones, without contracting flexibility when, for example, seeking funding from individuals or venture capitalists who might have varied business interests and therefore overlapping duties of loyalty. A reasonable expectation, and one likely adopted by the legislatures, would be that start-up and small firms would take advantage of the flexibility and it would have no effect on larger, public firms without these potential conflicts. Nonetheless, a law review article (Rauterberg and Talley, 2017), documents a substantial number of large public firms making waivers. Rauterberg and Talley (2017) note that when waiving the duty of loyalty to potentially conflicted board members, firms often extend the waiver to managers as well. This could be due to board capture, as well as a race-to-the-bottom in an attempt to attract and retain executives (see, for example, Acharya and Volpin, 2010). Thus, their law review article provides some basis for the concern that the effect of the waiver laws was broader than intended. In this study, we present the first investigation of the consequences of this shift in duty for corporate innovation and growth strategies at public firms.[1]

[1] In a concurrent working paper, Eldar, Grennan, and Waldock (2022) evaluate the economic consequences of common ownership for startups using the staggered adoption of corporate opportunity waivers laws across eight

Specifically, we use the staggered state-level adoption of corporate opportunity waivers to identify their causal effect on corporate innovation activity, the value shareholders put on internal financial slack, and the value implications of acquisitions. The waiver laws intended to solve a specific problem at small, emerging firms, but were written with unrestricted applicability to all firms. At larger firms, where contracting flexibility to raise capital is not an issue, the impact is uncertain because the net effect of agency conflicts weighed against the benefits of the waiver is an empirical question, and might well be expected to be small in the aggregate. The channels through which waivers could impact public firms would be through managers and inventors expropriating new opportunities for themselves without first offering them to their employer. Thus, in order for the waivers to impact innovation, they would have to increase inventor mobility and especially the rate at which inventors depart public firms to join startups (potentially taking an opportunity with them).

Under that scenario, public corporation capture of innovation, through patents assigned to the company, would decrease. Notably, waivers' effect on innovation input (R&D spending) is uncertain; granted the ability to take new opportunities for themselves, managers would be expected to increase R&D spending in the hopes of discovering an expropriable opportunity. Depending on whether one expects the board to decrease investment in R&D in response to the lower return on such investment, or whether one expects a captured board to go along with managers, R&D investment could increase or decrease.

Nonetheless, if expropriation is taking place, shareholders will place a lower value on internal slack because their return on the use of this slack is unambiguously lower. Finally, facing slower internal growth due to the lower value of investing in internal innovation, boards will pursue growth through acquisition, but as these are a second-best solution compared to the originally better internal growth opportunities, their announcement will induce more negative

states from 2000 to 2016 as an exogenous shock to common ownership and Geng, et al. (2022) investigate the laws' effect on board overlap and investment in public firms.

stock price reactions. This last result can obtain either due to worse acquisitions (partly because emerging firms no longer need to be acquired to finance their innovation), or due to the revelation bias documented in Wang (2018), which in this case is the revelation that the effect of the waiver is strong enough to diminish the firm's organic growth prospects, forcing it to conclude that it is better off acquiring.

We present evidence on the corporate opportunity waiver laws' net effect on a large panel of publicly traded U.S. firms, exploiting their staggered adoption by nine states between 2000 and 2016 (see Table 1). The ideal experimental setting would be randomized waiver implementation across firms. However, while the adoption of corporate opportunity waiver laws by state legislatures is exogenous to our sample firms, the decision to implement a waiver is endogenous to the firm. Therefore, throughout the paper, we use the next best experimental approach, which is to conduct intention-to-treat (ITT) analyses in a reduced form difference-in-differences (DiD) setting by framing our empirical tests on a state's adoption of a waiver law rather than on the actual implementation of the waiver by individual firms. To the extent that firms incorporated in states that enact the law do not include the waiver in their respective charters, our analyses would underestimate the true effect of the waiver law. As a result, the ITT effects we report should be viewed as a *lower bound* to the treatment-on-the-treated (TOT) effects (i.e., the effects of actually including the waiver in a corporate charter). Nevertheless, unlike the TOT effects, which are vulnerable to selection concerns, our ITT effects provide unbiased estimates of the average impact of a treatment (i.e., the passing of a waiver law) on the cohort of firms eligible to embrace the waiver.[2] Rauterberg and Talley (2017) present some summary evidence on the types of firms that add the waiver to their corporate charter, concluding that many large, unconstrained firms choose to do so. We discuss their evidence in Section 2 herein.

[2] Recent applications of the ITT approach include Berger, Turner and Zwick (2020), Von Beschwitz (2018), and Stango and Zinman (2014).

We first show that there is a sharp discontinuity in innovation after the adoption of the waivers, with R&D spending, patent value and patent counts all dropping in the year after the waiver adoption and remaining at the new lower level, rejecting the null that the laws' impact on large firms is limited. We then explore the value of the remaining innovation and find that the contribution of marginal spending on R&D to market value is lower, as is the incremental patent value. Next, using inventor-level data, we find that after waiver laws pass, firms experience abnormally high inventor departures and a drop in the innovation productivity of the inventors that remain. Moreover, results show that after waiver laws pass, the most talented inventors move to startup firms. The inventor-level results provide direct evidence on the mechanism through which the COW laws impact corporate-level innovation.

Having found that the waivers do impact corporate innovation activity, we next ask whether that translates to a lower value of slack and a shift in companies' acquisition activity. The results show that, subsequent to waiver law adoption, the market valuation of a marginal dollar of internal cash is 7 to 12 cents lower than it was prior to the waiver law adoption. Further, we test the hypothesis that, with greater potential expropriation of internal growth opportunities, the board turns to acquisitions for growth, and that after a waiver law passes, an acquisition announcement reveals more negative information to the stock market. We find that acquisition announcement returns are significantly lower after a waiver law adoption, and that acquirers are less likely to withdraw from acquisitions met with negative returns as well. This last result is consistent with the interpretation that the announcement reaction is due to the revelation of the waiver's effect on the acquirer's internal growth prospects rather than the value implication of the deal itself. We note that our results hold for Delaware-incorporated firms as well as for firms incorporated in other states that promulgate corporate opportunity waiver (COW) laws.

Additional tests provide evidence consistent with the theory in Jensen and Meckling (1976) that to reduce agency conflicts between managers and shareholders, managerial incentives should be tied to shareholder wealth. Indeed, in line with an agency channel underlying the

COW effects we observe, we find that higher managerial ownership or a greater proportion of independent board members reduces the effect of the waiver laws on the contribution of innovation to the market value of the firm, the value of internal slack, and the behavior of firms in the M&A market. Further, we show a direct connection between inventor departures and the documented value consequences, operating through an agency channel. Specifically, in high-tech industries, firms that lose inventors and exhibit high agency problems suffer significantly worse declines in value than those not losing inventors or those with low agency problems.

Our paper advances the growing literature on the real implications of changes in corporate law, and in particular, the heterogeneous impact of one-size-fits-all legislation. This work includes the vast literature on the effects of antitakeover legislation (see, Atanassov (2013) on innovation, and Karpoff and Wittry (2018) and Cain, McKeon and Solomon (2017), for example, more generally), and work on the effects of Universal Demand Laws (see, for example, Appel (2019)). Along with Rauterberg and Talley (2017), Eldar, Grennan, and Waldock (2022), Eldar and Grennan (2022) and Geng, et al. (2022), we form a small, but growing literature exploring corporate opportunity waivers. Eldar, et al. and Eldar and Grennan provide evidence of the intended positive effect of facilitating common ownership in start-up firms and in having a positive overall effect on entrepreneurial activity, including its ability to disrupt noncompetitive markets dominated by public firms. Geng, et al. show that by providing a safe harbor for overlapping board membership among competing firms, COW laws impact information spillover, and investment efficiency, and further conclude that coordination allows such overlapped firms to reduce competitive R&D. Our study is also related to the Barzuza and Smith (2014) study of Nevada in particular, and more generally on the race to the bottom in creating manager friendly corporate legal environments.

Overall, our study fits into the broad literature on corporate governance (see Yermack (2010), Edmans (2014), and Hilt (2014) for reviews) and how certain legal principles, such as the duty of loyalty, are critical determinants of the ability of shareholders to capture the value created by their investment. Changes in these duties impact the incentive to invest in innovation activities, which ultimately alters the growth path of innovating firms and hence, the allocation of assets in the economy. Lastly, our work contributes to a growing literature on inventor mobility (Almeida and Kogut, 1999; Marx, Strumsky, and Fleming 2009; Bernstein, 2015, Hombert and Matray, 2017; Brav, Jiang, Ma, and Tian, 2018, Balasubramaniam, et al. (2020), Starr, et al. (2022)) and, more broadly, to research on the migration of talented employees (Docquier and Rapoport 2012, Marx, Singh and Fleming (2015)). Our results indicate that corporate opportunity waivers promote the relocation of skilled human capital, such that their total welfare impact may still be positive.

The paper continues as follows. Section 2 provides a brief background on the corporate opportunities doctrine and the state legislated waivers to this doctrine. Section 3 evaluates the effect of a waiver on innovation activities, on their contribution to firm value, and on inventor mobility and productivity. Section 4 examines the impact of the waivers on the marginal value of cash. Section 5 considers whether and how the waivers affect acquisition decisions and outcomes. Section 6 explores whether agency is a channel underlying the COW effects we document. Section 7 presents several robustness tests. Our conclusions appear in Section 8. The variables we use in this study are defined in Appendix A. Appendix B presents additional analyses and robustness tests.

2. Corporate opportunity waivers

A foundational part of the duty of loyalty owed by corporate managers to shareholders is the corporate opportunities doctrine.[3] The corporate opportunities doctrine is the legal principle requiring that directors and officers of a corporation, in their role as fiduciaries, must not take for themselves any business opportunity that could benefit the firm. The purpose of the doctrine

[3] We draw from the law review article by Rauterberg and Talley (2017) in generating this summary of the corporate opportunities doctrine and waivers.

is to recognize an inevitable conflict of interest and decide it firmly in the shareholders' favor. Specifically, a self-interested fiduciary that discovers a business opportunity might be tempted to appropriate the opportunity for him or herself. However, a direct conflict of interest will arise if (1) the corporation is financially able to undertake the opportunity; (2) the opportunity is within the firm's line of business; (3) the corporation has an interest or expectancy in the opportunity; and (4) by personally appropriating the opportunity, the corporate fiduciary will thereby be placed in a position that conflicts with his duties to the corporation.[4] The doctrine resolves this conflict by unequivocally requiring the company to decline the opportunity before the fiduciary can pursue it.

This doctrine has been an immutable part of common law legal system's corporate law since the 1800s, which made it all the more surprising when the Delaware legislature amended Delaware corporate law to explicitly allow companies incorporated in that state to waive this part of the duty of loyalty. Delaware was soon followed by eight more states, thereby freeing thousands of US corporations to waive the opportunities requirement. Rauterberg and Talley (2017) estimate that over one thousand public companies have subsequently executed a corporate opportunities waiver.

The motivation for Delaware's action was sound; the existing doctrine was inflexible and demanded "undivided" loyalty of a fiduciary. However, many growing organization forms (venture capital, private equity, partial spin-offs, joint ventures, etc.) involve managers and board members with concerns in businesses with potentially overlapping interests. The existing doctrine did not permit a corporation the flexibility to contract on specific boundaries of

[4] These four parameters, which are outlined in the Broz v. Cellular Info. Sys 673 A.2d 148 (Del. 1996) decision, were first mentioned in the Delaware Chancery Court 1939 decision of Guth v. Loft. In that case, Charles Guth, president of Loft, Inc., a firm that served cola drinks in its fountain stores, relied on cola syrup supplied from Coca-Cola Ltd. Guth personally bought the Pepsi company and its syrup recipe after Pepsi filed for bankruptcy. Afterwards, using Loft's chemists, Guth reformulated Pepsi's syrup recipe and intended to sell it to Loft. As a result, Guth was sued by Loft's shareholders, who alleged that he breached his fiduciary duty of loyalty to the company by failing to offer the Pepsi business opportunity to Loft, instead appropriating it for himself. The court ruled in favor of Loft's shareholders.

loyalty. The rationale for the legislative action was to create that flexibility. Nonetheless, Rauterberg and Talley (2017) find that companies waiving the opportunities doctrine are typically large and profitable, not the types of companies that motivated the law change.

We briefly summarize the types of companies that are known to have enacted waivers. Unfortunately, the very flexibility built into the statutes makes it difficult to identify waiver enactments; the waivers can be enacted through charter amendment, bylaws, incorporated into contracts, or by board resolutions. Rauterberg and Talley (2017) discuss this problem in identifying which firms actually enact waivers. Nonetheless, after extensive filing searches and manual coding, they are able to determine that beginning in 2004, there was substantial growth in waiver enactment, and that they estimate that by 2014 over 1000 public firms had enacted a waiver. The Oil and Gas industry, as well as Business Services (which includes firms in hi-tech industries), have more waivers than proportional to their representation among public firms. By any measure, enacting firms are larger than the median Compustat firm, and are more profitable (ROA) with higher growth opportunities (as measured by Tobin's q) as well. Since our interest is in Intention-to-Treat, we do not attempt to construct the sample of waiver adopters ourselves, but instead turn to the broader consequences of these waivers in the rest of this study. To emphasize that these issues are at play even in large companies (as suggested by Rauterberg and Talley), we present a few examples of corporate opportunity lawsuits involving large public companies in Appendix B.

3. The effects of corporate opportunity waivers on innovation

We hypothesize that the unintended effect that allowing all corporations (rather than just small or emerging ones) to waive the corporate opportunities doctrine—a fundamental aspect of the duty of loyalty—will adversely affect corporate innovation because the firm's fiduciaries will no longer be required to subordinate their own interests to their corporation's shareholders. While at small firms, agency conflicts are not as severe and the flexibility for financing and advising will outweigh the agency conflict, the same is not true of large firms. As such, managers covered by a corporate opportunity waiver (COW) could legally pursue and develop new business projects for their personal benefit without the obligation of offering them to their firms. This will decrease the expected return on innovation activities, as some opportunities discovered in the course of research and development will be appropriated by fiduciaries, and will have a quick and lasting impact on the quality of current innovation retained by the company. To test this hypothesis, we first use firm-level data to study firms' innovation activity around the passing of COW laws by considering research and development (R&D) spending, the quality (value) of the innovation, and the number of patents generated. As we note in the introduction, firm capture of innovation output (patents) is predicted to decrease, but the prediction of innovation input (R&D) is ambiguous; it is an empirical question whether managers will be able to increase investment in R&D despite the fact that shareholder capture of the return on that investment has decreased. We then explore the impact of the waiver on the creators of the innovation—the inventors. Specifically, we investigate inventor productivity and mobility after COW laws are enacted.

Our econometric approach relies on DiD estimation based on the staggered state-level adoption of corporate opportunity waiver laws. Therefore, our empirical tests use an indicator variable set to one if the waiver is effective in the firm's incorporation state. If not, the indicator is set to zero. A potential concern with this strategy is that innovation activity might not happen at the state of incorporation. Nevertheless, according to the U.S. Supreme Court, the *internal affairs doctrine* is a conflict of laws principle stating that fiduciary matters peculiar to the relationships among or between the corporation and its officers, directors, and shareholders will be governed by the statutes and case law of the incorporation state.[5] In addition,

[5] See Edgar v. MITE Corp., 457 U.S. 624,645 (1982).

employment contracts often stipulate that the laws of the firm's state of incorporation shall govern any disputes or claims regardless of the location in which the alleged issues occurred. In our context, the use of the internal affairs doctrine by State Courts throughout the U.S. in claims involving the wrongful appropriation of business opportunities mitigates concerns related to the innovation activity location. We show robustness to this assumption in Section 7.

3.1. Firm-level analyses

We draw patent information from the Kogan, Papanikolaou, Seru, and Stoffman (2017) dataset which covers all patent applications filed with (and ultimately granted by) the US Patent and Trademark Office (USPTO) from 1926 to 2017. With the identifiers provided for each patent filing firm by Kogan *et al*., we merge their dataset with CRSP and Compustat to create a sample of 76,558 firm-years for 9,692 unique U.S. firms from 1996 to 2017.[6]

For our first proxy of innovation activity, we estimate R&D intensity by scaling R&D expenditures by the firm's assets. For the second proxy, we follow Kogan *et al*. (2017) and measure the quality of innovation (or patent's dollar value based on the stock market reaction upon the patent's approval) by adding all the values of patents that are granted to the firm in the year, and then scaling this total by the firm's assets.[7] For the third proxy, we use patent output (the number of patents granted scaled by the firm's assets) as it is a widely accepted measure of innovation (Hall, Jaffe, and Trajtenberg 2001). Nevertheless, comparing patent counts is not straight forward since counts vary over time and across technological classes. Moreover, counts are susceptible to a truncation bias because patents are recorded (in the Kogan *et al*. dataset) only after they are granted. We alleviate these issues by weighting each

[6] The sample excludes financials (SIC 4900-4999), utilities (SIC 6000-6999), and public administration firms (SIC 9000-9999).

[7] Specifically, for each patent, Kogan *et al*. use standard event study methods to estimate the firm's market-adjusted stock return running from the day of the patent approval announcement date until two days after (t, t+2).

patent by the mean number of patents granted in the same year and technology class (Hall, Jaffe, and Trajtenberg, 2001, 2005). Thus, patents granted in fields with more patent activity receive less weight.

Panel A of Table 2 provides summary statistics for our innovation sample. On average, firms invest an equivalent of 7.8% of their assets in R&D, which is close to the 7.3% value reported by Koh and Reeb (2015) for the same variable. We note that for the average firm, the value of its patents represents 3% of its assets, aligning well with the 3.1% reported by Kogan *et al*. (2017).

We begin with a simple test that considers changes in our innovation proxies around the adoption of a COW law. As treatment (i.e., passing of a COW law) occurs at different times for different states, we use the method in Gormley and Matsa (2014) and construct cohorts of treated and control firms for the three years before and the three years after each COW event. We then pool the data across cohorts and regress our innovation variables on a COW indicator for years (-3) through (+3), firm-cohort, headquarter state-year-cohort, and industry-year-cohort fixed effects. The COW indicator is set to one once the firm's state of incorporation adopts a COW law. Otherwise, the indicator is set to zero. For each innovation proxy, we plot the OLS point estimates excluding the indicator for the year in which a state passes the law—COW Year (0)—in order to trace its effect relative to this year.[8] The objective of these plots, which we report in Figure 1, is to determine whether there is a clear change in the trend of the innovation variables around the promulgation of COW laws. Visual inspection of Figure 1 reveals that the change in treatment group behavior describes a sharp decrease in innovation for all our innovation proxies *after* COW laws pass. According to Figure 1, after COW adoptions, R&D spending drops by 0.015, which represents a cut of 19% based on the sample mean of 0.078. Likewise, once COW laws are in effect, innovation value falls by 0.0055

[8] We winsorize the variables in these tests at the 1% tails to reduce noise in each period point estimate.

(equivalent to a 18% reduction from the sample mean of 0.030) and patent counts decline by 0.0012 (a 9% decrease from the sample mean of 0.014).

The plots in Figure 1 indicate that innovation activity, proxied by R&D spending, innovation value, and patent generation declines after COW laws pass. We complement the graphical analyses with regressions like those in Hall et. al. (2005). Specifically, Panel B of Table 2 presents six regressions in which we respectively evaluate the relative contribution of our three innovation variables to the market value of the firm. Equation (1) describes the baseline regression we estimate:

$$ln(\text{Tobin's } q)_{i,t} = \alpha_{i,t} + \beta_1 \text{innovation}_{i,t} + \beta_2 COW_{s,t} + \beta_3 \text{innovation}_{i,t} \times COW_{s,t} + f_i + \omega_{l,t} + \lambda_{j,t} \quad (1)$$

where i indexes firms, s indexes the firm's state of incorporation, l indexes a firm's headquarters (HQ) location, j indexes industries, and t indexes time.

In the baseline model, the dependent variable is the natural logarithm of Tobin's q and $COW_{s,t}$ is a (0,1) indicator variable denoting that a corporate opportunities waiver law is effective in state of incorporation s at time t at the end of the fiscal year. Equation (1) controls for unobserved firm heterogeneity, time-varying differences across states, and time-varying differences across industries by including firm (f_i), HQ state-by-year ($\omega_{l,t}$), and 3-digit SIC industry-by-year ($\lambda_{j,t}$) fixed effects for a firm i, headquartered in state l, operating in industry j, at time t. Angrist and Pischke (2009) and Gormley and Matsa (2014) argue that including additional controls in the presence of fixed effects may lead to biased parameter estimates if they are contemporaneously affected by the identifying construct (in our case, the passage of COW laws). Therefore, the baseline estimations of equation (1) reported as models 1, 3, and 5 of Table 2 Panel B exclude all control variables. We include the control variables in models 2, 4, and 6. In all tests, we control for serial correlation with robust Rogers (1993) standard errors clustered at the state of incorporation level s.

Looking at the regressions in Panel B of Table 2, we focus on the β_3 coefficient (for the innovation$_{i,t}$ × $COW_{s,t}$ interaction term) as it provides the contribution of our innovation proxies to the market value of the firm *after* COW laws pass. The results associated with β_3 indicate that the market value of the firm relies significantly less on innovation activity after COW laws pass. According to model 1, for example, a one percentage point increase in R&D intensity is associated with an increase of 0.57% in the firm's market value but it is reduced by 0.12% once a COW is in effect. Likewise, the estimates in model 3 imply that increasing the value of patents per dollar of assets by one percentage point is related to an increase of 0.31% in Tobin's *q* which is lowered by 0.07% when a waiver releases the firm's managers from their duty of loyalty.[9] Model 5 paints a similar picture: a single percentage point increase in the number of patents per dollar of assets contributes 0.39% to the average firm's market value, but once COW laws pass, the contribution drops by 0.24%.[10]

Overall, the results in Panel B of Table 2 suggest that once corporate fiduciaries can lawfully appropriate new business opportunities for themselves without first presenting them to the company, the relative contribution of innovation to their firm's market value declines sharply. In this regard, our results suggest that by diluting the fiduciary duty of loyalty, COW laws limit a firm's ability to grow organically.

3.2. Inventor-level analyses

The preceding tests show that public firms exhibit a decline in R&D spending, innovation value, and patent counts after their state of incorporation adopts COW laws. Because the COW laws make it possible to take an opportunity with you when exiting the firm, evidence of

[9] This result is not straightforward to interpret because the value of a patent is based on the patent's market reaction. One interpretation is that while the firm captures the value of the innovation with the patent, shareholders might capture less of the follow-on value of the innovation because of the waiver. This interpretation of the result is consistent with the view that our dependent variable, Tobin's *q*, is an often-used proxy for growth opportunities.
[10] Our results are qualitatively similar if we use the "total *q*" measure proposed by Peters and Taylor (2017) that considers intangible capital. For example, increasing the value of patents per dollar of assets by one percentage point is related to an increase of 0.42% in "total q" which is reduced by 0.08% after COW laws pass.

increased inventor departures would bear directly on this mechanism. Not only would this have a direct negative effect on a firm's innovation, but also it would indirectly reduce successful innovation further by disrupting the firm's teams and reducing the productivity of inventors who stay (consistent with the results in Bernstein (2015)). He finds that after an inventor leaves an IPO firm, those that remain (i.e., stayers) suffer a drop in their innovation productivity.[11]

In this section, we investigate the 'inventor mobility' and 'stayer productivity' conjectures by examining disambiguated data on inventor and innovation respectively drawn from the extended Kogan et al. (2017) data and the USPTO's PatentsViews databases. To obtain one observation per inventor-employer-year, we collapse into one observation all patents created by an inventor during the same year with the same employer. As in Bernstein (2015), we exclude inventors who appear only once in the database. This process identifies 792,944 different inventors employed in the U.S. from 1996 to 2018 leading to a sample of 6,092,123 inventor-employer-year observations. We use the unique inventor identifiers in the data to track individual inventors across different employers over time and estimate their individual innovation productivity. To identify inventors that switch employers (and the timing of the switch), we evaluate each pair of subsequent patents filed by every unique inventor. The year associated with each observation is the midpoint between the filing year of the first patent and the filing year of the next patent.[12]

Panel A of Table 3 presents summary statistics for our inventor-level data. We find that 12.84% of inventor-employer-year observations are associated with a move. Among 792,944 unique inventors in our sample, 32% switch employers at least once during their career. This

[11] Zacchia (2018) also find that the innovation productivity of a team of inventors declines after the departure of one of its members.

[12] If more than a year elapses between two patent filings, we assume that the employment switch happens at the midpoint between the patent application years. When the year of the move is different from the last year the inventor is with an employer before the move, we create a new inventor-employer-year observation with a pseudo year as the move year. The pseudo year is the midpoint between the last year with the last employer and the first year with the next employer. We also look at inventors over time to identify the first and the last year these inventors work for specific employers and create observations for the missing years during their careers.

incidence is comparable to the 25% average incidence of inventor moves reported by Rosenkopf and Almeida (2003). The average number of citations per patent in our sample is 14, a figure close to the mean of 13 that Bernstein (2015) reports for the same variable.

3.2.1. Inventor mobility

Panel B of Table 3 reports four different linear DiD regressions that we use to study inventor mobility. In all tests, the key independent variable, *COW*, equals one if the waiver law is effective in the employer's state of incorporation during the year, and equals zero otherwise. The regressions in Panel B include inventor fixed effects as well as technological sector-by-year fixed effects.

In the Model 1 of Panel B, the dependent variable, *Move (0,1)*, is set to one if the inventor switches employers during the year and is set to zero in the absence of such a switch. The results in Model 1 indicate that inventors are 1.4 percentage points more likely to move to another employer once COW laws pass. This is an economically meaningful increase when benchmarked against the 12.8% average unconditional probability of moving to a different employer in our data.

It is possible that some inventors switching employers go to early-stage private companies (i.e., startups). While these companies are not explicitly identified in the data, we code an employer as a startup if it is a first-time patent assignee private company. We use these assumptions to define the dependent variable in Model 2, *Move to a Startup (0,1)*, and set it to 1 if during the year the inventor moves to a startup and set it to zero otherwise. According to the coefficient estimate for *COW* in Model 2, after the waiver is enacted, inventors are 0.4 percentage points more likely to move to a startup. In our sample, this 0.4 percentage point increase substantially augments the 1.2% average unconditional probability of moving to a startup.

Next, we evaluate whether the most accomplished inventors are precisely those more likely to switch employers after COW laws pass. For this purpose, as in Baghai, Silva, and Ye (2019), we define "superstar" inventors as those in the top 25% of all sample inventors in terms of the number of patents granted by the USPTO. Model 3 shows that, in general, the passing of COW is not significantly associated with employer switches by superstar inventors. However, according to Model 4, superstar inventors are 0.2 percentage points more likely to move to a startup after the enactment of waivers laws. This is sizeable increase because, the annual unconditional probability of superstar inventors moving to a startup in the data is only 0.7%, on average. The increased transfer of innovation to startups is especially consistent with the ability of superstar inventors to discover an innovative opportunity and then choose to exploit it themselves rather than give it to their employer.

The results in Panel B indicate that inventors are more likely to switch jobs after the employer's state of incorporation adopts corporate opportunity waiver laws. This evidence is subject to some important caveats. For example, following Bernstein (2015) we remove inventors that appear only once in the disambiguated dataset. However, a dropped inventor could switch to an employer in which he has no subsequent patent filings. Moreover, to identify inventor mobility we rely on the inventor-employer association reported by the USPTO. However, even if this information is accurate, an inventor of record could leave her employer during the patent review period which will lead us to miss her job switch. If these error-in-measurement issues were pervasive, we could not detect whether COW laws affect the likelihood that inventors switch jobs as these errors would lead to a downward bias that would understate the statistical significance of our mobility measures.

3.2.2. Innovation productivity after inventor departures

In our data, almost 3.5 million inventor-employer-year observations involve a team of inventors that experience the departure of a teammate. We now study whether the productivity of the inventors that remain with the team (i.e., 'stayers') varies by whether their employer's state of incorporation enacts a COW law. For this purpose, in Panel C of Table 3 we estimate four different DiD regressions in which the respective dependent variables are the *Number of patents*, the *Number of citations*, the patents' *Generality*, and the patents' *Originality*.[13] Aside from these different dependent variables, the tests in Panel C are otherwise specified as those in Panel B.

Regression results in Panel C document no significant post-COW changes in either the *Originality* or the *Generality* of the patents produced by stayers. However, other results in that panel show that stayer inventors obtain 1.4% fewer patents (Model 1) and garner 5.5% fewer citations (Model 2) after a COW law passes.[14] The reduction in the innovation productivity of stayers is consistent with our earlier finding that a firm's innovation contributes less towards its market value once COW laws pass.

Overall, the inventor-level tests provide compelling evidence suggesting that weakening the duty of loyalty through corporate opportunity waivers boosts the probability that innovation projects are taken outside the boundary of the firm and developed elsewhere. According to our results, a post-COW increase in the mobility of inventors is a channel underlying this phenomenon. In Section 6, we connect inventor departures to the decrease in firm value documented in Table 2.

4. Corporate opportunity waivers and the marginal value of cash

Dittmar and Mahrt-Smith (2007) show that that the value of an extra dollar of cash is lower in firms with poor corporate governance. If our setting, we would expect a similar finding if

[13] The measures of originality and generality, which help us assess the importance of the innovation, are estimated following the steps outlined by Trajtenberg et al. (1997). Originality identifies patents that promote a new citation stream whereas generality distinguishes patents that influence a broad range of succeeding patent classes.
[14] We estimate the 1.4% drop in the number of patents and the 5.5% decline in the number of citations, relative to the annual mean for these variables as reported in Panel A of Table 3.

corporate opportunity waivers increase the expression of agency problems in firms incorporated in states that approve such waivers. We evaluate this possibility in this section.

We expand the empirical framework in Faulkender and Wang (2006),[15] in a specification, given by equation (2), as follows:

$$r_{i,t} - R^B_{i,t} = \gamma_0 + \gamma_1 COW_{s,t} + \gamma_2 \frac{\Delta C_{i,t}}{M_{i,t-1}} \times COW_{s,t} + \gamma_3 \frac{\Delta C_{i,t}}{M_{i,t-1}} + \gamma_4 \frac{\Delta E_{i,t}}{M_{i,t-1}} + \gamma_5 \frac{\Delta NA_{i,t}}{M_{i,t-1}} + \gamma_6 \frac{\Delta RD_{i,t}}{M_{i,t-1}} + \gamma_7 \frac{\Delta I_{i,t}}{M_{i,t-1}} + \gamma_8 \frac{\Delta D_{i,t}}{M_{i,t-1}} + \gamma_9 \frac{C_{i,t-1}}{M_{i,t-1}} + \gamma_{10} L_{i,t} + \gamma_{11} \frac{NF_{i,t}}{M_{i,t-1}} + \gamma_{12} \frac{C_{i,t-1}}{M_{i,t-1}} \times \frac{\Delta C_{i,t}}{M_{i,t-1}} + \gamma_{13} L_{i,t} \times \frac{\Delta C_{i,t}}{M_{i,t-1}} \quad (2)$$

where ΔX reflects the change in the variable X. $COW_{s,t}$ is a (0,1) dummy variable that, when set equal to 1, indicates that a corporate opportunities waiver law is effective in state of incorporation s at time t at the end of the fiscal year. $C_{i,t}$ and $C_{i,t-1}$ are cash and marketable securities at the end and beginning of the period (respectively), $E_{i,t}$ is earnings before interest and extraordinary items, $NA_{i,t}$ is total assets net of cash, $RD_{i,t}$ is research and development expenditures, $I_{i,t}$ is interest expense, $D_{i,t}$ is total dividends, $L_{i,t}$ is market leverage, and $NF_{i,t}$ is the net amount of external financing. All firm level control variables are normalized by the beginning of period market capitalization ($M_{i,t-1}$). In equation (2), the coefficient of interest, γ_2, measures the dollar change in equity value resulting from a dollar change in the firm's cash holdings *after* COW laws pass.

As in Masulis, Wang, and Xie (2009), we estimate the benchmark return in two different ways. The first is the value-weighted return based on market capitalization within each of the 25 Fama-French portfolios formed based on size and book-to-market ratio. The second is the value-weighted Fama-French (1997) 48-industry returns.

[15] Other recent papers that adapt the Faulkender and Wang specification include: Dittmar and Mahrt-Smith (2007); Masulis, Wang, and Xie. (2009); Denis and Sibilkov (2009); Harford, Klasa, and Maxwell (2014); and Duchin, Gilbert, Harford and Hrdlicka (2017).

Panel A of Table 4 presents descriptive statistics for the sample we use to estimate equation (2). It consists of 48,764 firm-years for 7,734 unique U.S. firms from 1996 to 2018 drawn from the merged CRSP-COMPUSTAT database. In many important respects, our sample looks like the samples used to estimate the marginal value of cash in other work. For instance, the median values for our size and market-to-book adjusted return and our industry-adjusted excess return are -11.2% and -7.7%, respectively. These values are similar in magnitude to the medians of -10.1% and 7.4% reported by Chen, Harford, and Lin (2015) for the same variables. In our sample, the median levels of cash (0.088) and leverage (0.138) are comparable to the medians reported for those variables (0.116 and 0.179) by Masulis *et al*. (2009).

Panel B of Table 4 presents the regression results for equation (2). In models 1 and 2, the dependent variable is the size and market-to-book adjusted excess return during fiscal year *t* whereas in models 3 and 4, it is the industry-adjusted excess return during fiscal year *t*.

We note that some control variables generate findings that match those in other studies. For instance, we find negative and significant coefficients for the interaction term between the change in cash and lagged cash, and for the interaction between leverage and change in cash. These results are consistent with those in Chen *et al*. (2015), Faulkender and Wang (2006), and Masulis *et al*. (2009).[16] More importantly, across the four models, we consistently estimate a statistically significant negative coefficient for γ_2, indicating that the value of an extra dollar of cash declines after COW laws are enacted. According to the estimates in Table 4 Panel B, on average, the value of an additional dollar falls by 9 to 12 cents in firms incorporated in states that pass corporate opportunities waiver legislation. This decrease is economically large and roughly equivalent to one standard deviation of the marginal value of cash (10.4 cents) before COW laws pass.

[16] Furthermore, in models 2 and 4, the respective estimates on Δ Cash, 1.542 and 1.647, are close to the values of 1.801 reported by Chen *et al*. (2015) and 1.466 reported by Faulkender and Wang (2006) for the same variable.

5. The impact of COW on firms' acquisitions

So far, our results (Panel B of Table 2) indicate that innovation activity contributes less to the market value of firms incorporated in states where their fiduciaries are covered by a corporate opportunities waiver. This evidence suggests that these waivers lessen the ability of firms to grow organically. When organic growth is muted, firms are likely to pursue growth through acquisitions. If those acquisitions are on average worse than before the waiver, or if the market then interprets an M&A announcement as revealing that the firm's internal growth prospects have declined, the announcement return will be lower, ceteris paribus (Wang, 2018). It is important to keep in mind that the law's passage at the state level is clearly known. As a result, the market can react and make a general assessment of how the potential of a waiver will affect public firms in that state (this is what we find in the event study tests upon the state passage of waiver laws which we present in Appendix B). By contrast, because the implementation of a waiver at the firm level is often hard to detect, further learning is expected, both about which firms have implemented the waivers, and about the implications of those waivers for specific firms' internal growth prospects. Consequently, a revelation effect upon an M&A announcement reflecting this updating would occur, even after the state passage of the law.

In this section, we evaluate these conjectures by examining whether firms covered by COW laws (i) are more likely to make acquisition bids, (ii) are more likely to make acquisition bids that are met with negative market announcement reactions, and (iii) are less likely to withdraw from M&A deals that trigger negative announcement returns.

5.1. Acquisition decisions

We begin with 81,134 firm-years for 9,752 unique U.S. firms excluding financials (SIC 4900-4999), utilities (SIC 6000-6999), and public administration firms (SIC 9000-9999) in the merged CRSP-COMPUSTAT database. We match these observations with information from the Securities Data Corporation's (SDC) US Mergers and Acquisitions (M&A) database to identify firms that issue acquisition bids during the sample period. Panel A in Table 5 presents descriptive statistics for this sample. We note that the unconditional probability of making an acquisition bid for our sample firms is 5.6%, a value that is within the 4.5% and 8.2% reported by Akbulut (2013) and Cai and Vijh (2005), respectively. We use the sample described in Panel A to evaluate the effect of COW laws on the likelihood of issuing a merger bid.

We examine firms' acquisition decisions using differences-in-differences estimation in which we expand the linear regression model in Comment and Schwert (1995) and Palepu (1986) with our COW indicator as the key independent variable. Specifically, in the six models reported in Panel B of Table 5, the dependent variables are as follows: a dummy variable set to 1 if the firm makes a merger bid during the year and set to 0 otherwise (in models 1 and 2), the natural logarithm of 1 plus the number of bids (in models 3 and 4), and the natural logarithm of 1 plus the total M&A deal value of all bids made by the firm during the year (in models 5 and 6). The odd-numbered models include headquarter state × year and industry × year fixed effects while the even-numbered tests include a vector of firm characteristics in addition to the fixed effects.

The COW indicator, our main independent variable, attains a positive and significant coefficient in all tests. The magnitude of the regression coefficients indicates that the effect of a COW is economically important. For example, looking at model 1 in Panel B of Table 5, we find that firms incorporated in COW states are 0.8% more likely to make a merger bid. This estimate represents an increase of 14 percentage points based on the 5.7% unconditional probability of issuing a bid for the sample firms. According to model 3, the annual number of M&A bids increases by 0.7% once COW laws are in effect. In terms of the money spent by the acquirers, the estimates in model 5 imply an increase of 4.7% in total M&A deal value after COW laws are enacted. Consistent with our conjectures, the results in Panel B of Table 5 suggest that firms covered by COW laws are more likely to grow through acquisitions and to commit more resources to achieve such growth.

5.2. Acquisition quality

We refine the sample in Table 5 Panel A by requiring that (i) the acquisition is completed, (ii) the transaction value reported in SDC is more than \$1 million and is at least 1% of the acquirer's market value of total assets, measured at the fiscal year-end before the M&A announcement, (iii) the acquirer owns less than 50% of the target's equity before the M&A announcement but more than 50% after the deal is completed, (iv) the acquirer has 272 trading days of stock return data before the M&A announcement available from CRSP and accounting data available from Compustat, and (v) the deal is not classified as a spinoff, recapitalization, exchange offer, repurchase, self-tender, or privatization. These requirements yield a sample of 4,716 completed U.S. domestic M&A deals made by 2,376 unique U.S. acquirers during 1996-2018. We use this sample, which is described in Panel A of Table 6, to study the effect of COW legislation on acquisition quality.

As can be seen in Panel A of Table 6, our summary statistics resemble those reported in other studies. For instance, at 0.346%, our median acquirer announcement return is comparable to the 0.473% reported by Masulis *et al*. (2009) for the same variable. Likewise, in our sample, the proportion of negative CAR deals is 0.466 which is close to the 0.517 reported in Chen *et al*. (2015). The magnitude for the mean values we report for the acquirer's size, Tobin's *q*, and ROA (8,258, 2.930, and 0.16) are similar to those in Chen *et al*. (8,460, 3.052, and 0.131).

We now use the sample described in Panel A of Table 6 in regressions that examine acquisition quality of firms incorporated in states that enact COW laws. These tests are reported in Panel B of Table 6. In model 1 of Panel B, the dependent variable is the acquirer's three-day cumulative abnormal return (CAR) during the window centered around the M&A announcement (-1,+1). We estimate abnormal returns as the acquirer's stock return minus the

CRSP value weighted market return (Dodd and Warner, 1983).[17] The independent variable of interest in model 1, COW (0,1), is a dummy variable that equals 1 if a corporate opportunities waiver law is effective in the firm's state of incorporation when the M&A deal is announced. Otherwise, the dummy variable equals 0. Model 1 also includes a wide array of acquirer- and deal-specific control variables like those in other studies (e.g., Masulis *et al*., 2009) as well as state × year and industry × year fixed effects.

The results in model 1 of Panel B (Table 6) indicate that that the three-day M&A CAR accruing to the acquirers in our sample is 77 basis points lower once COW laws pass. This drop implies a reduction of about US$64 million in the market capitalization for the average sample acquirer during the announcement period. To assess whether firms covered by COW laws are more likely to engage in inferior acquisitions, we set the dependent variable in model 2 of Panel B to 1 if the acquirer's CAR is negative and set it to 0 otherwise. All the right-hand side variables in model 2 are the same as those used in model 1. The results show that acquirers are 3 percentage points more likely to engage in acquisitions that generate negative stock market returns upon their announcement. This effect is economically large when benchmarked against the 47% incidence of M&A deals that generate negative M&A announcement CARs in our sample and also against an extensive body of research showing that market reactions to M&A announcements are, on average, neutral or mildly negative for acquirer firms (e.g., Andrade, Mitchell, and Stafford, 2001).

Next, we expand the sample to include withdrawn deals and examine whether COW coverage affects the acquirer firm's response to the investor's reaction to an M&A announcement. Earlier work shows that acquirers are more likely to rescind acquisition bids that are met with unfavorable investor reactions. The same work also shows that the propensity

[17] Fuller, Netter, and Stegemoller (2002) note that, in calculating abnormal returns, the estimation period often includes previous takeover bid announcements, particularly for frequent acquirers, making market model parameter estimation less meaningful. They also note that for short-window event studies, adjusting the market return by the firm's beta does not significantly improve the abnormal return estimation. Our analysis is robust to using the market model estimated during a one-year window ending one month before the deal announcement.

to pull out from a seemingly bad acquisition is lower for acquirer firms subject to agency problems (e.g., Chen, Harford, and Li, 2007). In model 3 of Panel B, we follow Masulis *et al*. (2009) and modify the specification of model 1 in two ways. First, in model 3, the dependent variable equals 1 if an acquisition is withdrawn and 0 otherwise. Second, as additional control variables, model 3 includes the acquirer's three-day M&A CAR (-1,+1) and the interaction between this CAR and the COW (0,1) indicator (i.e., COW × CAR (-1,+1)).

The results in model 3 are consistent with those in the earlier literature. We also find an inverse association between the market's reaction to the M&A upon its announcement and the probability that the deal is withdrawn. The estimates indicate that a 1% decrease in CAR is related to a 6.9% increase in the probability that the deal is withdrawn. More importantly, the COW × CAR (-1,+1) interaction term earns a positive and significant coefficient. This is consistent with our prediction that after a COW law passes, an acquisition announcement reveals the extent of the reduction in internal growth opportunities and the market's reaction is updating the value of the acquirer more than it is valuing the deal per se (consistent with the general evidence in Wang (2018)). As such, a negative market reaction would be less likely to induce the management team to withdraw the bid.

To add perspective to this finding and understand its economic importance, we consider the 508 M&A bids whose M&A announcement CARs are in the bottom decile. Among these acquisition announcements which resulted in the most negative stock price reactions, the withdrawal probability for the 199 acquirers subject to a COW is 9.55% whereas the withdrawal probability for the 309 acquirers in states not allowing loyalty waivers is 15.48%. The *p*-value for the difference in proportions between the two groups is 0.05. Unless directors in states enacting a COW statute are systematically less likely to learn from and react to the acquisition announcement return, the difference in withdrawal probabilities suggests that directors in COW states are focused on the acquisition as replacement for lost internal growth, rather than on the market's perception of the transaction. Such board behavior is consistent with our initial premise that a corporate opportunities waiver lowers the firm's value by reducing its avenues for internal growth. The extent of this reduction is revealed when the acquisition is announced.

The empirical findings in Panel B of Table 6 support the view that, once their state approves a COW law, firms face a lower return on internal growth and turn to second-best (less value-increasing) growth through acquisitions. Our results show that these firms are more likely to make M&A bids, and that the market reaction and subsequent managerial actions are consistent with the revelation of the negative effects of a corporate opportunities waiver on firm value.

6. Evidence of an agency channel

Managers of firms that waive the duty of loyalty can legally take for themselves new investments without requiring board approval. Therefore, in many of these firms, waiver laws misalign the incentives of managers and shareholders since the former are no longer dutybound to increase the latter's wealth. In this section, we examine whether greater managerial ownership dampens the effects of COW we document in our baseline analyses. This prediction follows from Jensen and Meckling (1976), and if confirmed, would be evidence that the COW law outcomes are operating through an agency channel. Mitigating agency conflicts at the top of the organization will reduce direct appropriation by top managers. Further, better CEO incentives and board governance reduce the likelihood that the firm would adopt the broad waivers permitted by the statutes in the first place.

For about 50% of our sample, we are able to obtain CEO ownership data from either Execucomp or the Thomson Financial Insider database. We use these data to re-estimate our baseline analyses in tests that interact the CEO's ownership in the firm (as a proportion of the firm's shares outstanding) with the COW (0,1) indicator. Except for this interaction term, the tests in Panels A, B, C, and D of Table 7 are otherwise similar to those in Table 2 Panel B, Table 4 Panel B, Table 5 Panel B, and Table 6 Panel B, respectively.[18]

The results in Panel A of Table 7 show that a one percentage point increase in R&D intensity is associated with an increase of 0.52% in the firm's market value but reduced by 0.18% once COW is in effect. Importantly, an interquartile increase in CEO ownership (2.8%) counteracts the reduction of 0.18% by 0.06%. The estimates in Panel B of Table 7 indicate that the same interquartile increase in CEO ownership offsets the 9.3 cents drop in the marginal value of cash associated with the passing of COW by 2.7 cents. The tests related to the dampening effect of managerial ownership on COW in the acquisition setting provides consistent results. In Panel C of Table 7 we observe that the passing of COW is related to an increase of 1.2% in probability of making a bid. An interquartile increase CEO ownership (2.8%) reduces the increase by 0.03%. More importantly, according to the estimates in Panel D, a similar growth in ownership is related to a 0.09% increase in the post-COW M&A announcement CARs (model 1), to a 0.39% drop in the probability that the merger generates a negative CAR (model 2), and to a 0.22% increase in the probability of terminating a bad takeover (model 3).

In general, the findings in Table 7 buttress the conclusion that the COW effects we observe are at least partially acting through an agency channel; managerial ownership, an agency conflict mitigation device, reduces the negative effects of a corporate opportunity waiver statute. To bolster this interpretation, in Table 8, we consider another agency mitigation proxy: the fraction of independent directors.[19] The results in Table 8 also support the idea that the impact of COW laws manifests through an agency channel as increasing the proportion of independent directors lessens the adverse impact of the waiver.

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[18] We cannot replicate the tests that use the inventor-level data because that data includes private firms.

[19] Fama and Jensen (1983) theorize that monitoring by independent directors incentivizes CEOs to take actions that are in their shareholders' best interests. As a result, their monitoring should alleviate agency problems such as tunnelling corporate resources (Harris and Raviv, 1978; Holmstrom, 1979; Holmstrom and Milgrom, 1991).

We find evidence consistent with the possibility that firms and investors are aware of the unintended consequences of COW and take some actions to allay this situation. Specifically, in untabulated multivariate analyses we find that, after COW laws pass, managerial ownership increases by 1.6% and the proportion of independent directors increases by 0.86%. Further, it is possible that informal channels also work to mitigate the potential negative effects of the waivers. These channels include trust and/or a culture of integrity, or the firm being known as a supportive, innovative place to work. Issues of culture and trust are well-studied in the management literature, but recent advances in the financial economics literature are tying measures of culture to outcomes such as innovation (see, for example, Li, et al. 2020).

Finally, in Table 9 we show how the agency channel connects the inventor departures documented in Table 3 directly to the value loss after the passage of COW laws. We use a CEO's ownership and their board's proportion of independent directors to identify firms with low or high agency problems. We then calculate the change in Tobin's q from two years before to two years after passage of a COW law. In Panel A, we examine high-tech firms: FF3 (Business Equipment, Telephone and Television Transmission) and FF4 (Healthcare, Medical Equipment, and Drugs), and in Panel B we examine all other firms. In each panel, we further split firms into those losing inventors and those not losing inventors. The results show that high-tech firms losing inventors or those with greater agency problems are significantly more likely to suffer a material value loss. In Panel B, we show that the problem is substantially muted outside the high-tech industries, as one would expect, but for such firms that still have inventors, losing inventors increases the probability of a material value loss.

7. Robustness tests

In this section, we conduct several analyses to probe the robustness of our baseline findings.

7.1. Innovation location

As discussed in Section 3, the internal affairs doctrine determines that the COW law of a firm's state of incorporation applies to its inventors regardless of the location of their activity. Yet, despite the frequent application of this doctrine, some courts have denied a transfer of venue from the state where a claim was filed (the forum state) to the firm's incorporation state.[20] Moreover, labor laws in California (and other states) stipulate that no firm shall require it employees residing and working in the state to agree to provisions that would deprive them of the basic protection of California law.[21] Given these issues, we assess the robustness of our baseline results in subsamples involving firms headquartered in their state of incorporation. Because several recent studies suggest that headquarter locations provide a reasonable approximation of a firm's major economic activity,[22] we assume that these are the places where innovation activity happens. From a legal standpoint, the rationale for studying firms headquartered and incorporated in the same state is that claims about the misappropriation of a corporate opportunity are likely to occur in the firm's state of incorporation.

The robustness tests involving firms headquartered and incorporated in the same state, reported in Table 10, generate inferences similar to those form our baseline analyses. These findings assuage concerns related to whether innovation activity does not occur at the firm's state of incorporation.

[20] For example, in Recurrent Capital Bridge Fund I, LLC v. ISR Systems and Sensors Corp., S.D.N.Y.2012, 875 F.Supp.2d 297, transfer of venue from New York to Florida was denied in a claim that corporate officers attempted to misappropriate a corporate opportunity, even though the alleged 'situs' of breach of fiduciary duty was in Florida.
[21] See: CAL. LAB. CODE § 925(a).
[22] See, for example, Pirinsky and Wang (2006), Dougal, Parsons, and Titman (2015), Barrot and Sauvagnat (2016), and Grieser, LeSage, and Zekhnini (2021).

7.2. Delaware incorporation, legal regime, and firm characteristics

Over fifty percent of all U.S. publicly listed firms are incorporated in Delaware.[23] Accordingly, the different samples we use to study the effect of COW laws exhibit a preponderance of Delaware incorporation. This issue raises the concern that Delaware firms might be driving our findings. To address it, we repeat our baseline tests by excluding Delaware-incorporated firms. Table 11 reports these additional analyses. The new estimates yield inferences similar to those from our baseline tests thereby dismissing the concern that Delaware firms drive our findings.

A related concern is that other contemporaneous corporate laws (many of which were first promulgated in Delaware) may have weakened corporate governance and lessened the impact of COW laws. Such a possibility would be congruent with the view by Karpoff and Wittry (2018) that the effect of a given governance law varies according (a) to key characteristics of the affected firms and (b) to the legal regime in which these laws are deployed.

Given the above discussion, in Table 12, we evaluate the robustness of our findings to controls for several governance and firm characteristics (e.g., classified board,[24] managerial ownership, active institutional ownership, dividend policy, common ownership, and the number of business segments).[25] In addition, in Table 13, we test whether our baseline results withstand control variables that track a state of incorporation's legal regime (e.g. the level of enforceability of non-compete (NC) laws,[26] and the presence of second generation business combination (BC) laws, control share acquisition (CS) laws, fair price (FP) laws, directors' duties (DD) laws, poison pill (PP) laws, and mandatory classified board (CB) laws). To be

[23] https://medium.com/useless-knowledge-daily/why-most-companies-incorporate-in-delaware-b8eae1e528a3

[24] Guernsey, Sepe, and Serfling (2022) assembled a classified board dataset consisting of nearly all US public firms by scraping DEF14 filings and applying a machine learning algorithm. Using their data instead of data from Institutional Shareholder Services allows us to study this governance mechanism for the largest possible sample of public firms.

[25] We cannot replicate the tests that use the inventor-level data because that data includes private firms.

[26] A series of papers by Marx and Starr and co-authors (e.g., Marx, Singh and Fleming (2015), Marx (2017), Balasubramanian, et al. (2020), Starr, Prescott and Bishra (2022) and Balasubramanian, Starr and Yamaguchi (2022)) show significant impacts of non-compete clauses on inventor mobility.

thorough, we also control for whether the state of incorporation adhered to the standards of review for takeovers set by notable court cases involving Revlon, Unocal, and Blasius. The rationale for adding the latter set of controls is that these court cases delineated the fiduciary responsibilities incumbent upon directors and officers during takeovers.[27] The results in Tables 12 and 13 indicate that our baseline findings survive controls for key governance and firm characteristics and for the state of incorporation legal regime, respectively.

7.3. Empirical issues

We now discuss and address several econometric concerns that could threaten the reliability of our findings.

7.3.1. Uneven distribution of industries across states

Our tests of the impact of COW laws rely on DiD analyses based on equation (1) which, among other variables, includes HQ state-by-year and industry-by-year fixed effects. We note, however, that these fixed effects might be insufficient to account for the uneven distribution of industries across states. Moreover, during the time period of the collapse of the so-called Internet bubble, the distribution of industries across states that were subject to business cycle fluctuations shifted, which may be an important confounding factor. Therefore, to address concerns about shifts in the distribution of industries across states over time, we appraise the robustness of our baseline findings by including HQ state-by-industry-by-year fixed effects. The analyses that include these fixed effects, reported in Table 14, yield results similar to those from our baseline tests.

7.3.2. Propensity score matching

To investigate whether a selection problem might be driving our findings, we use propensity score matching (PSM) methodology to find control firms for the matched DiD

[27] See Cox and Thomas (2017) for a discussion of these cases.

regressions. For each treated firm (i.e., a firm incorporated in a state in which the waiver is in effect), we identify candidate control firms as those incorporated in the same HQ state and operating in the same industry as the treated firm with similar characteristics (firm size, leverage, operating performance, classified board, managerial ownership, institutional ownership, dividend payments, number of business segments, degree of common ownership) during the year. Because the matching occurs jointly on multiple variables, the treatment and control samples do not have the same size for all matched characteristics. Consequently, we use nearest-neighbor matching with replacement to generate a control group for every baseline test. The PSM results, reported in Table 15, generate inferences that are similar to those arising from our baseline regressions.

7.3.3. Stacked difference-in-differences estimation

Our baseline results rely on staggered difference-in-differences (DiD) estimation to evaluate outcome variables after a firm state of incorporation passes COW laws (the treatment group) against similar changes for firms incorporated elsewhere (the control group). Recent causal inference studies argue that, under some circumstances, staggered DiD models could yield biased estimates (e.g., Borusyak and Jaravel, 2020; Callaway and Sant'Anna, 2020; Sun and Abraham, 2021). The issue in some DiD models, known as the heterogeneous treatment problem, arises when later-treated observations serve as controls before treatment is applied while earlier-treated ones serve as controls after treatment is applied. For example, the latter situation could occur if a state that passes a law later reverses its original ruling. Baker, Larcker, and Wang (2022) and Cengiz, Dube, Lindner, and Zipperer (2019) suggest that these issues can be alleviated through stacked DiD estimation. The stacked DiD designs generate event-specific cohorts that include treated firms and "clean control matching firms." These matching control firms never experience a material change inside the event estimation window or treatment outside the same window. These requirements to enter the treatment and matching control groups avoid heterogeneous treatment problems as they ensure that early-treated firms are not used as effective controls for later-treated firms. These cohorts are then stacked in relative time across all events as if all treatments occur at once. The results from the stacked DiD estimation (reported in Table 16) produce inferences that are in line with those from our baseline tests.

7.4. Additional analyses and robustness tests

To conserve space, we report additional analyses and robustness tests in Appendix B. Below, we provide a brief summary of this work.

7.4.1. Waiver benefits to small firms

As noted earlier, the intent of the waiver laws is to improve the ability of parties that focus on providing financial backing and other types of support (e.g., venture capital and private equity firms) to contract with the entities that need such a help (e.g., small and emerging businesses). Therefore, if the laws are working as intended, then we should observe benefits to these firms. In Appendix B, we present evidence consistent with this conjecture. Investor reactions upon the enactment of the waiver laws are positive and statistically significant for small cap stocks but not for mid or large cap stocks. In addition, while ROA decreases for large firms post-COW enactment, it improves for small cap firms.

Moreover, while we do not find an increase in IPOs (or VC-backed IPOs) after COW enactments, the waiver laws appear to benefit emerging firms in other ways. In concurrent work, Eldar, Grennan, and Waldock (2022) study the value of common ownership for startups, using COW law adoptions as exogenous shocks to common ownership. They find that post-COW law, startups are more likely to have VC common owners. They also find that the same startups are more likely to exit through higher valuation IPOs. Indirect evidence suggests that after COW laws, small firms are less reliant on large firms to exploit their innovation; the initiation of joint ventures and strategic alliances decreases, and institutional ownership shifts toward smaller firms. Thus, our results related to small cap firms along with the VC ownership findings by Eldar *et al.*, suggest that some smaller firms benefit from COW laws. As such, there is evidence that the laws had their intended effects, but our study uncovers substantial unintended effects as well.

7.4.2. Concerns with DiD methods

With difference-in-differences (DiD) methods, we study changes in innovation activity, the marginal value of cash, and acquisition decisions for firms once their state of incorporation adopts a corporate opportunities waiver law (the treatment group) against changes in the same characteristics for firms not subject to the law (the control group). As noted by Bertrand, Duflo, and Mullainathan, (2004), two econometric issues threaten the validity of DiD models: lack of parallel trends, and serial correlation. While testing for ex post counterfactual parallel trends is inheritably infeasible, we run multivariate falsification tests showing that, in the absence of the treatment (i.e., the passing of a waiver law), the difference between the treatment and control groups stays constant over time. These findings, reported in Appendix B, suggest that our analyses comply with parallel trends. In addition, Appendix B presents results from non-parametric permutation tests (Chetty, Looney, and Kroft, 2009) suggest that serial correlation and artificially inflated *t*-statistics do not bias our results.

8. Conclusions

In 2000, a quiet revolution in the standards of corporate governance started. States, beginning with standard-setter Delaware, began allowing boards to waive the long-standing duty of loyalty barring managers from appropriating business opportunities for themselves. While the reasonable goal of contracting-flexibility for start-ups seeking financing was the driver of this change, research by Rauterberg and Talley (2017) finds that many large, unconstrained public firms embrace the waivers.

We study the impact of these waivers where they would be most expected to matter: innovation. Small, emerging firms, where agency conflicts are less of a concern and the contracting flexibility motivating the waivers is valuable, could benefit. However, at larger firms, the possibility that managers could appropriate new discoveries for their own benefit decreases the return on investment in innovation. Exploiting the staggered introduction of the waiver laws, we find that public firms invest less in R&D, produce fewer patents, and less valuable patents after COW statute enactment. Moreover, these firms exhibit abnormally high inventor departures and a decline in the innovation productivity of their remaining inventors. In line with the drop in innovation productivity, the contribution of innovation activities to firm value decreases, and with a reduction in internal growth opportunities, firms turn toward acquisitions instead. The (lower) market reaction to the acquisition announcements is consistent with the revelation of the value implications of the waiver.

Consistent with an agency conflict channel, we find that the effect from the waiver laws is less harmful in firms with high managerial ownership and those with more independent boards. While contracting flexibility is generally value-increasing for small and emerging businesses, our study provides policy-relevant evidence that in the case of weakening fiduciary duty, the effect for other firms has been negative.

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Figure 1: Innovation around COW adoption

This figure plots OLS point estimates of the effect of corporate opportunity waiver (COW) law on R&D spending, value of patents, and number of patents. To cleanly identify the timing of the effect, we construct cohorts of treated and control firms for six years around each COW adoption event. We then pool the data across cohorts and regress the outcome variable on COW indicators, firm-cohort, headquarters state-year-cohort, and industry-year-cohort fixed effects. The gray shading represents 90% confidence intervals using heteroskedasticity-consistent standard errors clustered by state of incorporation.

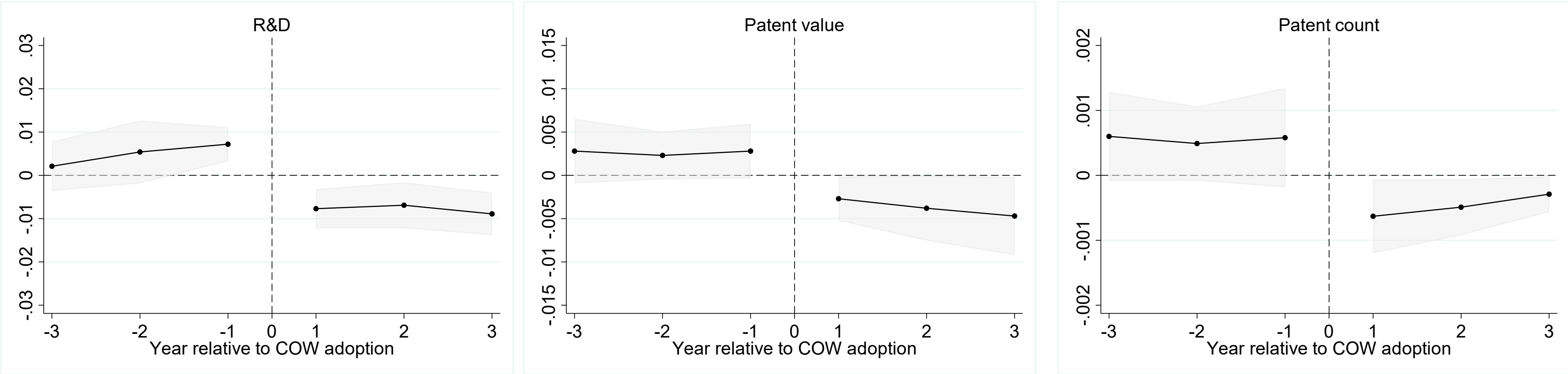

Table 1: State adoption of Corporate Opportunity Waivers law

This table presents the dates that Corporate Opportunity Waivers (COW) law was adopted. Data on the adoption of the law are obtained from Rauterberg and Talley (2017).

State	Implementing Statute	Effective date
Delaware	Del. Code Ann. tit. 8, § 122(17)	July 1, 2000
Oklahoma	Okla. Stat. Ann. tit. 18, § 1016(17)	November 1, 2001
Missouri	Mo. Ann. Stat. § 351.385(16)	October 1, 2003
Kansas	Kan. Stat. Ann. § 17-6102 (17)	January 1, 2005
Texas	Tex. Bus. Orgs. Code Ann. § 2.101(21)	January 1, 2006
Nevada	Nev. Rev. Stat. Ann. § 78.070(8)	October 1, 2007
New Jersey	NJ Stat. Ann. 14A:3-1(q)	March 11, 2011
Maryland	Md. Code Ann., Corps. & Ass'ns § 2-103(15)	October 1, 2014
Washington	Wash. Rev. Code Ann. § 23B.02.020(5)(k)	January 1, 2016

Table 2: COW and the market's valuation of innovation

The sample consists of 76,558 firm-years for 9,692 unique publicly traded U.S. firms excluding financials (SIC 4900-4999), utilities (SIC 6000-6999), and public administration firms (SIC 9000-9999) in the merged CRSP-COMPUSTAT database with complete data to analyze the market's valuation of innovation from 1996 to 2017. Panel A presents the sample summary statistics. COW is one if the firm is incorporated in a state which has passed a Corporate Opportunity Waivers law by the fiscal year end date, and zero otherwise. Innovation characteristics variables are scaled by the firm's book value of assets. All continuous variables are winsorized at the 1% and 99% level. In Panel B, the dependent variable is the natural logarithm of the firm's Tobin's q. COW is one if the firm is incorporated in a state which has passed a Corporate Opportunity Waivers law by the fiscal year end date, and zero otherwise. The coefficient for this variable is the difference-in-differences estimate. In each model we control for whether the respective innovation measure is zero. All coefficients are estimated by OLS. Industry fixed effects use 3-digit SIC and state fixed effects are based on headquarters location. Robust standard errors are clustered at the state of incorporation level. All variables are defined in Appendix A. *, **, and *** represent statistical significance at the 10%, 5%, and 1% level, respectively.

Panel A: Summary statistics

	Mean	Std	Q1	Median	Q3
COW	0.531	0.499	0	0	1
Market valuation					
ln(Tobin's q)	0.561	0.623	0.123	0.444	0.892
Innovation					
R&D spending	0.078	0.129	0.001	0.023	0.997
Dollar value of patents	0.030	0.076	0	0	0.009
Number of patents	0.014	0.073	0	0	0.003
Firm characteristics					
Market value of equity (in $ million)	3,006	16,375	55	250	1,073
Leverage	0.191	0.221	0.004	0.110	0.305
ROA	0.027	0.329	0.005	0.100	0.159

Panel B: Multivariate analyses

	Dependent variable: *ln*(Tobin's *q*)											
Innovation measure =	R&D spending				Value of patents				Number of patents			
	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6	
	Coefficient	*p*-value	Coefficient	*p*-value	Coefficient	*p*-value	Coefficient	*p*-value	Coefficient	*p*-value	Coefficient	*p*-value
Innovation	0.566***	0.000	0.544***	0.000	0.310***	0.000	0.274***	0.000	0.390***	0.000	0.304***	0.000
COW	-0.048**	0.012	-0.040**	0.013	-0.047***	0.003	-0.035***	0.004	-0.052***	0.006	-0.044***	0.004
COW × Innovation	**-0.123****	**0.022**	**-0.133*****	**0.008**	**-0.068****	**0.018**	**-0.063*****	**0.013**	**-0.241*****	**0.000**	**-0.255*****	**0.001**
Firm characteristics												
Size			-0.073***	0.000			-0.081***	0.000			-0.079***	0.000
Leverage			-1.035***	0.000			-1.026***	0.000			-1.053***	0.000
ROA			0.212***	0.000			0.070***	0.007			0.069***	0.009
Zero innovation (0,1)	0.030**	0.023	0.029**	0.020	0.095***	0.000	0.070***	0.000	0.072***	0.000	0.048***	0.000
Firm FEs	Yes		Yes		Yes		Yes		Yes		Yes	
State × Year FEs	Yes		Yes		Yes		Yes		Yes		Yes	
Industry × Year FEs	Yes		Yes		Yes		Yes		Yes		Yes	
N	76,558		76,558		76,558		76,558		76,558		76,558	
Adjusted R^2	0.585		0.644		0.600		0.650		0.590		0.642	
Regression's *p*-value	0.000		0.000		0.000		0.000		0.000		0.000	

Table 3: COW and inventor mobility and productivity

The sample consists of 6,092,123 inventor-employer-years for 792,944 different inventors employed in the U.S. from 1996 to 2018. We obtain disambiguated data on inventor and innovation from Kogan et al. (2017) and the USPTO's PatentsViews, respectively. The disambiguated data contains unique inventor identifiers that allows us to follow individual inventors across different employers over time and track annual changes in their innovation productivity. Panel A presents the sample summary statistics. In Panel B, the dependent variable is respectively set to one if, during the year, an inventor moves to another employer in model 1, an inventor moves to a startup in model 2, a superstar inventor moves to another employer in model 3, and a superstar inventor moves to a startup in model 4. Otherwise, these dependent variables are set to zero. In Panel C, the sample includes only staying inventors (i.e., those that do not leave their employer during the year when another inventor departs). In Panel C, the dependent variable is the number of patents filed by an inventor during the year in model 1, the number of citations for the patents filed by an inventor during the year in model 2, the average generality score of the patents filed by an inventor in during the year in model 3, and the average originality score of the patents filed by an inventor during the year in model 4. COW is an indicator variable equal to one for the inventor-year if the inventor's employer is incorporated in a state in which a Corporate Opportunity Waivers is effective. The indicator equals zero otherwise. The coefficient for this variable is the difference-in-differences estimate. All coefficients are estimated by OLS due to high dimension fixed effects. Robust standard errors are clustered at the firm level. All variables are defined in Appendix A. The symbols *, **, and *** represent statistical significance at the 10%, 5%, and 1% level, respectively.

Panel A: Summary statistics					
	Mean	Std	Q1	Median	Q3
COW	0.333	0.471	0	0	1
Inventor mobility					
Move (0,1)	0.128	0.335	0	0	0
Move to a start-up (0,1)	0.012	0.139	0	0	0
Superstar move (0,1)	0.079	0.270	0	0	0
Superstar move to a start-up (0,1)	0.007	0.108	0	0	0
Innovation activity					
Number of patents	0.946	1.977	0	1	1
Number of citations	14.053	99.339	0	0	5
Generality	0.148	0.250	0	0	0.282
Originality	0.213	0.273	0	0	0.471

Panel B: Inventor mobility

Dependent variable =	Move (0,1)		Move to a start-up (0,1)		Superstar move (0,1)		Superstar move to a start-up (0,1)	
	Model 1		Model 2		Model 3		Model 4	
	Coefficient	*p*-value	Coefficient	*p*-value	Coefficient	*p*-value	Coefficient	*p*-value
COW	**0.014********	**0.009**	**0.004********	**0.000**	**0.004**	**0.218**	**0.002********	**0.000**
Inventor FEs	Yes		Yes		Yes		Yes	
(Tech sector × Year) FEs	Yes		Yes		Yes		Yes	
N	6,092,123		6,092,123		6,092,123		6,092,123	
Adjusted R^2	0.234		0.181		0.137		0.141	
Reg's *p*-value	0.000		0.000		0.000		0.000	

Panel C: Productivity of inventors who remain with employers that suffer an inventor departure

Dependent variable =	Number of patents		Number of citations		Generality		Originality	
	Model 1		Model 2		Model 3		Model 4	
	Coefficient	*p*-value	Coefficient	*p*-value	Coefficient	*p*-value	Coefficient	*p*-value
COW	**-0.005***	**0.000**	**-0.007***	**0.000**	**0.001**	**0.310**	**0.003**	**0.218**
Inventor FEs	Yes		Yes		Yes		Yes	
(Tech sector × Year) FEs	Yes		Yes		Yes		Yes	
N	3,471,287		3,471,287		3,471,287		3,471,287	
Adjusted R^2	0.260		0.319		0.189		0.189	
Reg's *p*-value	0.000		0.000		0.000		0.000	

Table 4: COW and the marginal value of cash holdings

The sample consists of 48,764 firm-years for 7,734 unique U.S. firms excluding financials (SIC 4900-4999), utilities (SIC 6000-6999), and public administration firms (SIC 9000-9999) in the merged CRSP-COMPUSTAT database with complete data to analyze the marginal value of cash holdings from 1996 to 2018. Panel A presents the sample summary statistics. COW is one if the firm is incorporated in a state which has passed a Corporate Opportunity Waivers law by the fiscal year end date, and zero otherwise. $^{+}$ denotes that the variable is scaled by the market value of equity of the firm of fiscal year *t-1*. All dollar values are inflation adjusted to 2001 using the Consumer Price Index (CPI). All continuous variables are winsorized at the 1% and 99% level. In Panel B, the dependent variable is the size and market-to-book adjusted annual excess stock returns during fiscal year *t* in Models 1 and 2 and the industry adjusted annual excess stock returns in Models 3 and 4. COW is one if the firm is incorporated in a state which has passed a Corporate Opportunity Waivers law by the fiscal year end date, and zero otherwise. The coefficient for this variable is the difference-in-differences estimate. All coefficients are estimated by OLS. Industry fixed effects use 3-digit SIC and state fixed effects are based on headquarters location. Robust standard errors are clustered at the state of incorporation level. All variables are defined in Appendix A. *, **, and *** represent statistical significance at the 10%, 5%, and 1% level, respectively.

Panel A: Summary statistics					
	Mean	Std	Q1	Median	Q3
COW	0.529	0.499	0	1	1
Excess stock returns during the fiscal year					
Size and M/B adjusted annual excess return	-0.059	0.517	-0.378	-0.112	0.172
Industry adjusted annual excess return	-0.034	0.526	-0.340	-0.077	0.189
Firm characteristics					
Market value of equity (in $ million)	2,833	12,631	63	312	1,313
Leverage	0.201	0.210	0.015	0.138	0.318
Δ Cash $_{t}^{+}$	0.001	0.104	-0.029	0	0.029
Cash $_{t-1}$	0.151	0.184	0.032	0.088	0.200
Δ Earnings $_{t}^{+}$	0.006	0.174	-0.030	0.004	0.033
Δ Net assets $_{t}^{+}$	0.034	0.310	-0.048	0.015	0.101
Δ R&D $_{t}^{+}$	0.000	0.019	0	0	0.001
Δ Interest $_{t}^{+}$	0.001	0.016	-0.002	0	0.002
Δ Dividends $_{t}^{+}$	-0.000	0.006	0	0	0
Net financing $_{t}^{+}$	0.033	0.173	-0.032	0	0.049

Panel B: Multivariate analyses								
	Dependent variable							
	Size and market-to-book adjusted annual excess stock return				Industry adjusted annual excess stock return			
	Model 1		Model 2		Model 3		Model 4	
	Coefficient	*p*-value	Coefficient	*p*-value	Coefficient	*p*-value	Coefficient	*p*-value
Δ Cash	0.857***	0.000	1.542***	0.000	0.942***	0.000	1.647***	0.000
COW × Δ Cash	**-0.087***	**0.064**	**-0.095*****	**0.000**	**-0.092****	**0.049**	**-0.120*****	**0.001**
COW	-0.024	0.357	0.002	0.918	0.012	0.352	0.014	0.209
Cash $_{t-1}$ × Δ Cash			-0.440***	0.001			-0.468***	0.000
Leverage × Δ Cash			-0.165***	0.000			-0.175***	0.000
Δ Earnings			0.379***	0.000			0.420***	0.000
Δ Net assets			0.191***	0.000			0.211***	0.000
Δ R&D			0.390***	0.003			0.432***	0.007
Δ Interest			-0.555***	0.003			-0.974***	0.000
Δ Dividends			0.677***	0.003			1.053***	0.000
Cash $_{t-1}$			0.938***	0.000			1.007***	0.000
Leverage			-1.035***	0.000			-1.022***	0.000
Net financing			0.041***	0.001			0.045***	0.000
Firm FEs	Yes		Yes		Yes		Yes	
State × Year FEs	Yes		Yes		Yes		Yes	
Industry × Year FEs	Yes		Yes		Yes		Yes	
N	48,764		48,764		48,764		48,764	
Adjusted R^2	0.138		0.274		0.139		0.287	
Reg's *p*-value	0.000		0.000		0.000		0.000	

Table 5: COW and the market for corporate control

In Panel A, the sample consists of 81,134 firm-years for 9,752 unique U.S. firms excluding financials (SIC 4900-4999), utilities (SIC 6000-6999), and public administration firms (SIC 9000-9999) in the merged CRSP-COMPUSTAT database with complete data to analyze acquisition decisions from 1996 to 2018. Panel A presents this sample's summary statistics. In Panel B, the dependent variable is one if the firm makes an M&A bid in a given year and zero otherwise in Panel B model 1 and 2, the number of M&A bids made by the firm in a given year in Panel B model 3 and 4, and the total value of all M&A bids made by the firm in a given year in Panel B model 5 and 6. COW is one if the acquirer is incorporated in a state which has passed a Corporate Opportunity Waivers law by the fiscal year end date, and zero otherwise. The coefficient for this variable is the difference-in-differences estimate. All coefficients are estimated by OLS due to the use of high dimensional fixed effects. Industry fixed effects use 3-digit SIC and state fixed effects are based on headquarters location. Robust standard errors are clustered at the state of incorporation level. All variables are defined in Appendix A. *, **, and *** represent statistical significance at the 10%, 5%, and 1% level, respectively.

Panel A: Summary statistics

	Mean	Std	Q1	Median	Q3
COW	0.535	0.499	0	1	1
Acquisition decision					
Bid (0,1)	0.056	0.230	0	0	0
ln(1 + number of bids)	0.042	0.176	0	0	0
ln(1 + deal value)	0.266	1.196	0	0	0
Firm characteristics					
Market value of equity (in $ million)	1,688	4,900	53	238	1,011
Leverage	0.199	0.225	0.005	0.119	0.321
Tobin's *q*	2.131	1.638	1.146	1.571	2.439
Liquidity	-1.898	6.563	-0.470	-0.030	-0.003
ROA	0.119	0.113	0	0.106	0.182

Panel B: Multivariate analyses												
Dependent variable =	Bid (0,1)				*ln*(1 + number of bids)				*ln*(1 + bid value)			
	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6	
	Coefficient	*p*-value	Coefficient	*p*-value	Coefficient	*p*-value	Coefficient	*p*-value	Coefficient	*p*-value	Coefficient	*p*-value
COW	**0.008****	**0.040**	**0.008****	**0.041**	**0.007*****	**0.004**	**0.007*****	**0.006**	**0.047****	**0.013**	**0.046****	**0.017**
Firm characteristics												
Size			0.021***	0.000			0.016***	0.000			0.117***	0.000
Leverage			0.041***	0.000			0.029***	0.000			0.268***	0.000
Tobin's *q*			-0.000	0.496			-0.000	0.868			0.000	0.980
Liquidity			-0.000***	0.000			-0.000***	0.000			-0.000***	0.000
ROA			0.000**	0.016			0.000**	0.013			0.000**	0.048
State × Year FEs	Yes		Yes		Yes		Yes		Yes		Yes	
Industry × Year FEs	Yes		Yes		Yes		Yes		Yes		Yes	
N	81,134		81,134		81,134		81,134		81,134		81,134	
Adjusted R^2	0.079		0.083		0.099		0.103		0.094		0.099	
Regression's *p*-value	0.040		0.000		0.004		0.000		0.013		0.000	

Table 6: COW and acquisition quality

In Panel A, the sample consists of 4,716 completed U.S. domestic mergers and acquisitions (M&A) from the SDC M&A database made by 2,376 unique U.S. acquirers excluding financials (SIC 4900-4999), utilities (SIC 6000-6999), and public administration firms (SIC 9000-9999) in the merged CRSP-COMPUSTAT database with complete data to analyze acquisition quality during the fiscal year end 1996-2018 before the merger public announcement date. We exclude observations involving spinoffs, recapitalizations, exchange offers, repurchases, self-tenders, privatizations, acquisitions of remaining interest, and partial interests or assets, and those with deal value less than $1 million. COW is one if the acquirer is incorporated in a state which has passed a Corporate Opportunity Waivers law by the fiscal year end date, and zero otherwise. Acquirer characteristics are measured at the fiscal year end before deal announcement. All variables are defined in Appendix A. All dollar values are inflation adjusted to 2001 using the Consumer Price Index (CPI). All continuous variables are winsorized at the 1% and 99% level. In Panel B model 1, the dependent variable is the acquirer's cumulative abnormal return (CAR) in percentage points during the three-day window period around the deal announcement date. In Panel B model 2, the dependent variable equals one if the acquirer's CAR is negative and zero otherwise. In Panel B model 3, to study the probability of deal withdrawal, we add 366 withdrawn deals during the same period to the above sample. The dependent variable in this model equals one if the acquisition is withdrawn and zero otherwise. COW is one if the acquirer is incorporated in a state which has passed a Corporate Opportunity Waivers law by the fiscal year end date, and zero otherwise. The coefficient for this variable is the difference-in-differences estimate. Industry fixed effects use 3-digit SIC and state fixed effects are based on headquarters location. Robust standard errors are clustered at the state of incorporation level. All variables are defined in Appendix A. *, **, and *** represent statistical significance at the 10%, 5%, and 1% level, respectively.

Panel A: Summary statistics					
	Mean	Std	Q1	Median	Q3
COW	0.476	0.499	0	0	1
Acquirer announcement returns					
CAR(-1,+1) %	0.866	7.622	-2.703	0.346	4.203
1 if CAR(-1,+1) < 0, 0 otherwise	0.466	0.499	0	0	1
Acquirer characteristics					
Market value of equity (in $ million)	8,258	22,935	248	864	3,790
Leverage	0.188	0.189	0.009	0.150	0.229
Tobin's *q*	2.930	2.955	1.420	1.977	3.123
Liquidity	-0.408	1.828	-0.045	-0.004	-0.001
ROA	0.164	0.132	0.071	0.150	0.229
Deal characteristics					
Deal value (in $ million)	465	1,167	23	90	365
Relative size	0.261	0.432	0.031	0.096	0.287
Private target	0.497	0.500	0	0	1
Subsidiary target	0.123	0.328	0	0	0
All cash payment	0.378	0.485	0	0	1
Tender offer	0.085	0.280	0	0	0
Hostile deal	0.002	0.048	0	0	0
Competed deal	0.017	0.129	0	0	0
Toehold	0.031	0.173	0	0	0
Lock up	0.005	0.070	0	0	0
Merger of equals	0.004	0.062	0	0	0
Diversifying deal	0.394	0.511	0	0	1

Panel B: Multivariate analyses						
Dependent variable =	CAR(-1,+1) % Model 1		1 if CAR(-1,+1) < 0, 0 otherwise Model 2		1 for withdrawn deals, 0 otherwise Model 3	
	Coefficient	*p*-value	Coefficient	*p*-value	Coefficient	*p*-value
COW	**-0.772****	**0.025**	**0.030****	**0.040**	-0.011	0.303
CAR(-1,+1)					-0.069**	0.019
COW × CAR(-1,+1)					**0.138*****	**0.000**
Acquirer characteristics						
Size	-0.353***	0.000	0.012***	0.000	-0.013***	0.000
Leverage	0.456	0.356	0.022	0.220	0.026**	0.016
Tobin's *q*	-0.041**	0.026	-0.002***	0.003	0.000	0.687
Liquidity	-0.010	0.262	-0.000***	0.000	-0.000***	0.000
ROA	0.006***	0.000	-0.000***	0.000	0.000	0.732
Deal characteristics						
Relative size	-0.011***	0.000	0.000***	0.000	0.000	0.605
Private target	2.275***	0.000	-0.125***	0.000	-0.074***	0.000
Subsidiary target	2.506***	0.000	-0.106***	0.000	-0.068***	0.000
All cash payment	0.272	0.184	-0.068***	0.000	-0.003	0.697
Tender offer	0.511	0.227	-0.006	0.788	-0.066***	0.003
Hostile deal	3.455*	0.055	0.006	0.961	0.565***	0.000
Competed deal	0.846	0.548	-0.009	0.777	0.342***	0.000
Toehold	0.194	0.415	-0.027	0.331	0.021	0.453
Lock up	-4.130***	0.000	0.065	0.254	0.024	0.428
Merger of equals	2.182	0.198	-0.226***	0.000	0.114***	0.003
Diversifying deal	-0.102	0.664	0.010	0.350	0.003	0.644
State × Year FEs	Yes		Yes		Yes	
Industry × Year FEs	Yes		Yes		Yes	
N	4,716		4,716		5,082	
Adjusted R^2	0.024		0.035		0.213	
Regression's *p*-value	0.000		0.000		0.000	

Table 7: Managerial ownership

This table presents the effect of managerial ownership on the relationship between COW and the market's valuation of innovation, the market value of cash holdings, and acquisition decisions. We obtain CEO ownership data from either Execucomp or Thomson Financial Insider database. We use these data to re-estimate our baseline analyses in tests that interact the CEO's ownership in the firm (as a proportion of the firm's shares outstanding) with the COW (0,1) indicator. Except for this interaction term, the tests in Panels A, B, C, and D herein are otherwise similar to those in Table 2 Panel B, Table 4 Panel B, Table 5 Panel B, and Table 6 Panel B, respectively. All variables are defined in Appendix A. *, **, and *** represent statistical significance at the 10%, 5%, and 1% level, respectively.

Panel A: Market's valuation of innovation

	Dependent variable: *ln*(Tobin's *q*)					
Innovation measure =	R&D spending Model 1		Value of patents Model 2		Number of patents Model 3	
	Coef	*p*-value	Coef	*p*-value	Coef	*p*-value
Innovation	0.524***	0.000	0.321***	0.000	0.559***	0.000
COW	-0.043*	0.059	-0.016	0.345	-0.029	0.193
COW × Innovation	**-0.178*** **	**0.000**	**-0.068** **	**0.034**	**-0.238** **	**0.014**
Ownership	0.009	0.298	0.012	0.269	0.012	0.225
Innovation × Ownership	0.078	0.786	0.100	0.691	-2.007*	0.066
COW × Ownership	0.005	0.423	0.001	0.921	0.001	0.937
COW × Innovation ×Ownership	**2.143** **	**0.014**	**0.547** **	**0.021**	**5.442*** **	**0.000**
Other controls as in Table 2	Panel B Model 1		Panel B Model 3		Panel B Model 5	
Adjusted R^2	0.616		0.624		0.615	
N	42,571		42,571		42,571	

Panel B: Market value of cash holdings

Dependent variable =	Size and M/B adjusted annual excess stock return Model 1		Industry adjusted annual excess stock return Model 2	
	Coefficient	*p*-value	Coefficient	*p*-value
Δ Cash	1.695***	0.000	1.841***	0.000
COW	-0.025	0.327	-0.034*	0.076
COW × Δ Cash	**-0.093** **	**0.040**	**-0.161** **	**0.030**
Ownership	0.020	0.103	0.023	0.178
Δ Cash × Ownership	0.209	0.462	0.495	0.308
COW × Ownership	0.045	0.398	0.105**	0.027
COW × Δ Cash × Ownership	**0.961** **	**0.025**	**1.357** **	**0.039**
Other controls as in Table 4	Panel B Model 2		Panel B Model 4	
Adjusted R^2	0.289		0.235	
N	24,606		24,606	

Panel C: Acquisition decisions						
Dependent variable =	Bid (0,1)		*ln*(1 + number of bids)		*ln*(1 + bid value)	
	Model 1		Model 2		Model 3	
	Coefficient	*p*-value	Coefficient	*p*-value	Coefficient	*p*-value
COW	0.012**	0.027	0.012**	0.034	0.072*	0.088
COW × Ownership	**-0.011*****	**0.000**	**-0.006*****	**0.000**	**-0.047*****	**0.000**
Ownership	-0.008***	0.000	-0.007***	0.000	-0.039***	0.000
Other controls as in Table 5	Panel B Model 2		Panel B Model 4		Panel B Model 6	
Adjusted R^2	0.070		0.102		0.089	
N	38,388		38,388		38,388	

Panel D: Acquisition quality						
Dependent variable =	CAR(-1,+1) %		1 if CAR(-1,+1) < 0, 0 otherwise		1 for withdrawn deals, 0 otherwise	
	Model 1		Model 2		Model 3	
	Coefficient	*p*-value	Coefficient	*p*-value	Coefficient	*p*-value
COW	-0.973**	0.026	0.047***	0.006	-0.032	0.178
COW × Ownership	**3.387***	**0.084**	**-0.140***	**0.053**	0.063	0.397
Ownership	0.814	0.520	0.102	0.131	0.051	0.417
CAR(-1,+1)					-0.079**	0.049
CAR(-1,+1) × Ownership					-0.621	0.454
COW × CAR(-1,+1)					0.193**	0.027
COW×CAR(-1,+1)×Ownership					**-8.034*****	**0.000**
Other controls as in Table 6	Panel B Model 1		Panel B Model 2		Panel B Model 3	
Adjusted R^2	0.061		0.045		0.225	
N	2,378		2,378		2,586	

Table 8: Independent directors

This table presents the effect of independent directors on the relationship between COW and the market's valuation of innovation, the market value of cash holdings, and acquisition decisions. We obtain the proportion of independent directors on the board from Institutional Shareholder Services (formerly RiskMetrics/IRRC) database. We use these data to re-estimate our baseline analyses in tests that interact the proportion of independent directors (ID) with the COW (0,1) indicator. Except for this interaction term, the tests in Panels A, B, C, and D herein are otherwise similar to those in Table 2 Panel B, Table 4 Panel B, Table 5 Panel B, and Table 6 Panel B, respectively. All variables are defined in Appendix A. *, **, and *** represent statistical significance at the 10%, 5%, and 1% level, respectively.

Panel A: Market's valuation of innovation

	Dependent variable: *ln*(Tobin's *q*)					
Innovation measure =	R&D spending Model 1		Value of patents Model 2		Number of patents Model 3	
	Coef	*p*-value	Coef	*p*-value	Coef	*p*-value
Innovation	0.216*	0.083	0.269***	0.000	0.846**	0.032
COW	-0.063*	0.051	-0.022	0.507	-0.060**	0.028
COW × Innovation	**-0.746***	**0.061**	**-0.235*****	**0.000**	**-3.337*****	**0.001**
ID	-0.126	0.144	-0.080	0.284	-0.067	0.339
Innovation × ID	0.711	0.420	0.017	0.822	-2.050	0.268
COW × ID	0.025	0.670	0.002	0.972	0.018	0.704
COW × Innovation × ID	**1.457****	**0.049**	**0.232*****	**0.000**	**5.828*****	**0.005**
Other controls as in Table 2	Panel B Model 1		Panel B Model 3		Panel B Model 5	
Adjusted R^2	0.681		0.698		0.679	
N	22,382		22,382		22,382	

Panel B: Market value of cash holdings

Dependent variable =	Size and M/B adjusted annual excess stock return Model 1		Industry adjusted annual excess stock return Model 2	
	Coefficient	*p*-value	Coefficient	*p*-value
Δ Cash	3.054***	0.000	3.698***	0.000
COW	-0.162**	0.039	-0.050*	0.098
COW × Δ Cash	**-1.821*****	**0.008**	**-2.462*****	**0.000**
ID	-0.026	0.631	0.014	0.807
Δ Cash × ID	-1.183	0.141	-1.906**	0.023
COW × ID	0.121**	0.043	0.040	0.405
COW × Δ Cash × ID	**2.136****	**0.014**	**3.094*****	**0.000**
Other controls as in Table 4	Panel B Model 2		Panel B Model 4	
Adjusted R^2	0.318		0.286	
N	14,795		14,795	

Panel C: Acquisition decisions						
Dependent variable =	Bid (0,1)		*ln*(1 + number of bids)		*ln*(1 + bid value)	
	Model 1		Model 2		Model 3	
	Coefficient	*p*-value	Coefficient	*p*-value	Coefficient	*p*-value
COW	0.088***	0.000	0.070***	0.000	0.604***	0.000
COW × ID	**-0.088*****	**0.000**	**-0.060****	**0.035**	**-0.621*****	**0.000**
ID	-0.031	0.199	-0.023	0.331	-0.170	0.249
Other controls as in Table 5	Panel B Model 2		Panel B Model 4		Panel B Model 6	
Adjusted R^2	0.089		0.119		0.101	
N	23,287		23,287		23,287	

Panel D: Acquisition quality						
Dependent variable =	CAR(-1,+1) %		1 if CAR(-1,+1) < 0, 0 otherwise		1 for withdrawn deals, 0 otherwise	
	Model 1		Model 2		Model 3	
	Coefficient	*p*-value	Coefficient	*p*-value	Coefficient	*p*-value
COW	-1.040***	0.001	0.358***	0.002	-0.013	0.568
COW × ID	**0.880*****	**0.001**	**-0.346*****	**0.002**	-0.010	0.776
ID	-0.106	0.588	0.167	0.156	-0.008	0.752
CAR(-1,+1)					-0.017	0.892
CAR(-1,+1) × ID					-0.177	0.448
COW × CAR(-1,+1)					0.351*	0.079
COW × CAR(-1,+1) × ID					**-0.590****	**0.033**
Other controls as in Table 6	Panel B Model 1		Panel B Model 2		Panel B Model 3	
Adjusted R^2	0.093		0.077		0.210	
N	1,533		1,533		1,688	

Table 9: Connecting the inventor departure and value consequences through the agency channel

This table shows the proportion of firms with a decline of 10% or more in Tobin's q from year -2 to year +2 relative to the year a COW law passes. The sample includes 4,281 treated firms (i.e., those incorporated in states that pass a COW law. We track firms that lose at least one inventor during the first two years after a COW law passes. We denote firms as having a 'high' agency problem if, across all firms during the year the waiver law passes, managerial ownership is below the median and the proportion of independent director is below the median value. Hi-tech industries include firms in the FF3 (Business Equipment, Telephone and Television Transmission) and FF4 (Healthcare, Medical Equipment, and Drugs). Non-hi-tech industries include firms in the FF1, FF2, and FF5 groups. The symbols *, **, and *** represent statistical significance at the 10%, 5%, and 1% level, respectively.

Proportion of firms with a decline in Tobin's q ≥ 10%

Panel A: Hi-tech industries

	(1) Firms losing inventors (N=747)	(2) Firms not losing inventors (N=888)	z-statistic for difference in proportions (1) – (2)
(3) Low agency problem (N=1419)	0.564	0.496	2.512**
(4) High agency problem (N=216)	0.683	0.514	2.443**
z-statistic for difference in proportions (4) – (3)	2.601***	0.283	

Panel B: Non-hi-tech industries

	(1) Firms losing inventors (N=404)	(2) Firms not losing inventors (N=2242)	z-statistic for difference in proportions (1) – (2)
(3) Low agency problem (N=2152)	0.491	0.403	2.757***
(4) High agency problem (N=494)	0.511	0.375	2.728***
z-statistic for difference in proportions (4) – (3)	0.388	1.005	

Table 10: Firms headquartered and incorporated in the same state

This table presents the effects of COW law on the market's valuation of innovation in Panel A, inventor mobility in Panel B, innovation productivity in Panel C, marginal value of cash holdings in Panel D, acquisition decisions in Panel E, and acquisition quality in Panel F using the respective subsamples of firms headquartered and incorporated in the same state in each test. All variables are defined in Appendix A. *, **, and *** represent statistical significance at the 10%, 5%, and 1% level, respectively.

Panel A: Market's valuation of innovation

	Dependent variable: *ln*(Tobin's *q*)					
Innovation measure =	R&D spending Model 1		Value of patents Model 2		Number of patents Model 3	
	Coefficient	*p*-value	Coefficient	*p*-value	Coefficient	*p*-value
Innovation	0.159***	0.070	0.257***	0.000	0.255***	0.000
COW	-0.127	0.432	-0.132	0.402	-0.132	0.408
COW × Innovation	**-0.137*****	**0.007**	**-0.125****	**0.001**	**-0.126*****	**0.001**
Controls as in Table 2	Panel B Model 1		Panel B Model 3		Panel B Model 5	
N	12,338		12,338		12,338	

Panel B: Inventor mobility

Dependent variable =	Move (0,1)		Move to a start-up (0,1)		Superstar move (0,1)		Superstar move to a start-up (0,1)	
	Model 1		Model 2		Model 3		Model 4	
	Coefficient	*p*-value	Coefficient	*p*-value	Coefficient	*p*-value	Coefficient	*p*-value
COW	**0.005****	**0.000**	**0.003*****	**0.000**	**-0.001**	**0.124**	**0.001****	**0.022**
Controls as in Table 3	Panel B Model 1		Panel B Model 2		Panel B Model 3		Panel B Model 4	
N	3,853,069							

Panel C: Productivity of inventors who remain with employers that suffer an inventor departure

Dependent variable =	Number of patents		Number of citations		Generality		Originality	
	Model 1		Model 2		Model 3		Model 4	
	Coefficient	*p*-value	Coefficient	*p*-value	Coefficient	*p*-value	Coefficient	*p*-value
COW	**-0.005*****	**0.000**	**-0.010*****	**0.000**	**-0.116***	**0.061**	**-0.083**	**0.277**
Controls as in Table 3	Panel C Model 1		Panel C Model 2		Panel C Model 3		Panel C Model 4	
N	2,202,754		2,202,754		2,202,754		2,202,754	

Panel D: Marginal value of cash

Dependent variable =	Size and market-to-book adjusted annual excess stock return Model 1		Industry adjusted annual excess stock return Model 2	
	Coefficient	*p*-value	Coefficient	*p*-value
Δ Cash	1.506***	0.000	1.026***	0.000
COW × Δ Cash	**-0.468***	**0.073**	**-0.306****	**0.043**
COW	-0.056	0.359	-0.008	0.867
Controls as in Table 4	Panel B Model 2		Panel B Model 4	
N	10,673		10,673	

Panel E: Acquisition decisions						
Dependent variable =	Bid (0,1) Model 1		*ln*(1 + number of bids) Model 2		*ln*(1 + bid value) Model 3	
	Coefficient	*p*-value	Coefficient	*p*-value	Coefficient	*p*-value
COW	**0.107*****	**0.002**	**0.078*****	**0.001**	**0.344****	**0.012**
Baseline model as in Table 5	Panel B Model 1		Panel B Model 3		Panel B Model 5	
N	18,625		18,625		18,625	

Panel F: Acquisition quality						
Dependent variable =	CAR(-1,+1) % Model 1		1 if CAR(-1,+1) < 0, 0 otherwise Model 2		1 for withdrawn deals, 0 otherwise Model 3	
	Coefficient	*p*-value	Coefficient	*p*-value	Coefficient	*p*-value
COW	**-0.294****	**0.020**	**0.068***	**0.005**	0.005	0.693
CAR(-1,+1)					-0.131**	0.018
COW × CAR(-1,+1)					**0.326***	**0.069**
Baseline model as in Table 6	Panel B Model 1		Panel B Model 2		Panel B Model 3	
N	1,149		1,149		1,227	

Table 11: Non-Delaware effects of COW

This table presents the effects of COW law on the market's valuation of innovation in Panel A, inventor mobility in Panel B, innovation productivity in Panel C, marginal value of cash holdings in Panel D, acquisition decisions in Panel E, and acquisition quality in Panel F using the respective subsamples of non-Delaware firms in each test. All variables are defined in Appendix A. *, **, and *** represent statistical significance at the 10%, 5%, and 1% level, respectively.

Panel A: Market's valuation of innovation

	Dependent variable: *ln*(Tobin's *q*)					
Innovation measure =	R&D spending Model 1		Value of patents Model 2		Number of patents Model 3	
	Coefficient	*p*-value	Coefficient	*p*-value	Coefficient	*p*-value
Innovation	0.541***	0.000	0.274***	0.000	0.305***	0.000
COW	-0.040**	0.013	-0.040***	0.003	-0.044***	0.004
COW × Innovation	**-0.137*****	**0.007**	**-0.060****	**0.016**	**-0.253*****	**0.001**
Controls as in Table 2	Panel B Model 2		Panel B Model 4		Panel B Model 6	
N	23,892		23,892		23,892	

Panel B: Inventor mobility

Dependent variable =	Move (0,1)		Move to a start-up (0,1)		Superstar move (0,1)		Superstar move to a start-up (0,1)	
	Model 1		Model 2		Model 3		Model 4	
	Coefficient	*p*-value	Coefficient	*p*-value	Coefficient	*p*-value	Coefficient	*p*-value
COW	**0.013****	**0.017**	**0.004*****	**0.000**	**0.003**	**0.378**	**0.002*****	**0.000**
Controls as in Table 3	Panel B Model 1		Panel B Model 2		Panel B Model 3		Panel B Model 4	
N	1,957,259		1,957,259		1,957,259		1,957,259	

Panel C: Productivity of inventors who remain with employers that suffer an inventor departure

Dependent variable =	Number of patents		Number of citations		Generality		Originality	
	Model 1		Model 2		Model 3		Model 4	
	Coefficient	*p*-value	Coefficient	*p*-value	Coefficient	*p*-value	Coefficient	*p*-value
COW	**-0.005*****	**0.000**	**-0.011*****	**0.000**	**0.001**	**0.442**	**0.003**	**0.200**
Controls as in Table 3	Panel C Model 1		Panel C Model 2		Panel C Model 3		Panel C Model 4	
N	2,307,985		2,307,985		2,307,985		2,307,985	

Panel D: Marginal value of cash

Dependent variable =	Size and market-to-book adjusted annual excess stock return Model 1		Industry adjusted annual excess stock return Model 2	
	Coefficient	*p*-value	Coefficient	*p*-value
Δ Cash	1.201***	0.000	1.381***	0.000
COW × Δ Cash	**-0.075*****	**0.005**	**-0.086****	**0.038**
COW	-0.004	0.852	0.014	0.235
Controls as in Table 4	Panel B Model 2		Panel B Model 4	
N	17,573		17,573	

Panel E: Acquisition decisions						
Dependent variable =	Bid (0,1) Model 1		*ln*(1 + number of bids) Model 2		*ln*(1 + bid value) Model 3	
	Coefficient	*p*-value	Coefficient	*p*-value	Coefficient	*p*-value
COW	**0.007**[**]	**0.044**	**0.006**[**]	**0.012**	**0.040**[*]	**0.040**
Controls as in Table 5	Panel B Model 1		Panel B Model 3		Panel B Model 5	
N	26,146		26,146		26,146	

Panel F: Acquisition quality						
Dependent variable =	CAR(-1,+1) % Model 1		1 if CAR(-1,+1) < 0, 0 otherwise Model 2		1 for withdrawn deals, 0 otherwise Model 3	
	Coefficient	*p*-value	Coefficient	*p*-value	Coefficient	*p*-value
COW	**-0.734**[**]	**0.030**	**0.039**[**]	**0.012**	-0.015	0.147
CAR(-1,+1)					-0.062[**]	0.015
COW × CAR(-1,+1)					**0.097**[**]	**0.014**
Controls as in Table 6	Panel B Model 1		Panel B Model 2		Panel B Model 3	
N	1,506		1,506		1,629	

Table 12: Additional governance and firm characteristic controls

This table presents the effects of COW law on the market's valuation of innovation in Panel A, marginal value of cash holdings in Panel B, acquisition decisions in Panel C, and acquisition quality in Panel D controlling for classified board, managerial ownership, institutional ownership, dividend payments, number of business segments, and the degree of common ownership. We do not perform the inventor level tests controlling for these characteristics which are available only for public firms. All model specifications follow those in the previous tables as specified in each regression. All variables are defined in Appendix A. *, **, and *** represent statistical significance at the 10%, 5%, and 1% level, respectively.

Panel A: Market's valuation of innovation

	Dependent variable: *ln*(Tobin's *q*)					
Innovation measure =	R&D spending Model 1		Value of patents Model 2		Number of patents Model 3	
	Coefficient	*p*-value	Coefficient	*p*-value	Coefficient	*p*-value
Innovation	0.732***	0.000	0.308***	0.000	0.181	0.103
COW	-0.052**	0.036	-0.047**	0.020	-0.063**	0.011
COW × Innovation	**-0.268*****	**0.000**	**-0.094*****	**0.001**	**-0.243****	**0.027**
Classified board	-0.002	0.866	-0.011	0.347	-0.002	0.864
Managerial ownership	2.591*	0.065	2.510*	0.069	2.493*	0.072
Active institution ownership	-0.013	0.606	-0.017	0.520	-0.024	0.360
Dividend paying	0.043***	0.000	0.059***	0.000	0.046***	0.000
Number of segments	-0.001	0.637	0.000	0.765	0.000	0.831
Common ownership	14.706***	0.000	5.801***	0.000	5.908***	0.000
Other controls as in Table 2	Panel B Model 2		Panel B Model 4		Panel B Model 6	
N	42,571		42,571		42,571	

Panel B: Marginal value of cash

Dependent variable =	Size and market-to-book adjusted annual excess stock return Model 1		Industry adjusted annual excess stock return Model 2	
	Coefficient	*p*-value	Coefficient	*p*-value
Δ Cash	2.554***	0.000	2.665***	0.000
COW × Δ Cash	**-0.462*****	**0.002**	**-0.491*****	**0.001**
COW	-0.129*	0.061	-0.120***	0.007
Classified board	-0.008	0.484	-0.008	0.536
Managerial ownership	6.967**	0.014	0.071	0.979
Active institution ownership	-0.276***	0.000	-0.303***	0.000
Dividend paying	-0.025**	0.029	-0.021	0.123
Number of segments	0.003***	0.007	0.004***	0.001
Common ownership	-1.253	0.195	21.218***	0.002
Other controls as in Table 4	Panel B Model 2		Panel B Model 4	
N	24,606		24,606	

Panel C: Acquisition decisions						
Dependent variable =	Bid (0,1) Model 1		*ln*(1 + number of bids) Model 2		*ln*(1 + bid value) Model 3	
	Coefficient	*p*-value	Coefficient	*p*-value	Coefficient	*p*-value
COW	**0.007****	**0.071**	**0.007******	**0.008**	**0.042*****	**0.026**
Classified board	0.016***	0.000	0.013***	0.000	0.067***	0.000
Managerial ownership	-0.664	0.352	-0.368	0.498	-1.682	0.494
Active institution ownership	0.010	0.308	0.007	0.255	0.021	0.556
Dividend paying	0.002	0.542	0.001	0.887	0.018	0.326
Number of segments	0.000	0.372	0.000	0.294	0.003**	0.042
Common ownership	0.563***	0.000	0.761***	0.000	5.928***	0.000
Other controls as in Table 5	Panel B Model 2		Panel B Model 4		Panel B Model 6	
N	38,388		38,388		38,388	

Panel D: Acquisition quality						
Dependent variable =	CAR(-1,+1) % Model 1		1 if CAR(-1,+1) < 0, 0 otherwise Model 2		1 for withdrawn deals, 0 otherwise Model 3	
	Coefficient	*p*-value	Coefficient	*p*-value	Coefficient	*p*-value
COW	**-1.019*****	**0.032**	**0.033*****	**0.043**	-0.017	0.135
CAR(-1,+1)					-0.122***	0.008
COW × CAR(-1,+1)					**0.122*****	**0.022**
Classified board	-0.931***	0.000	0.022	0.175	-0.013	0.216
Managerial ownership	-1.224	0.778	-0.020	0.841	-0.058	0.422
Active institution ownership	0.184	0.537	0.050***	0.006	0.006	0.671
Dividend paying	0.004	0.864	-0.003**	0.015	-0.001	0.399
Number of segments	6.404***	0.007	-0.135	0.243	0.040	0.431
Common ownership	1.170**	0.042	0.012	0.809	0.014***	0.000
Other controls as in Table 6	Panel B Model 1		Panel B Model 2		Panel B Model 3	
N	2,378		2,378		2,586	

Table 13: Additional legal controls

This table presents the effects of COW law on the market's valuation of innovation in Panel A, inventor he mobility in Panel B, innovation productivity in Panel C, marginal value of cash in Panel D, acquisition decisions in Panel E, and acquisition quality in Panel F controlling for the level of enforceability of non-compete (NC) laws, the presence of second generation business combination laws (control share acquisition (CS) laws, business combination (BC) laws, fair price (FP) laws, directors' duties (DD) laws, and poison pill (PP) laws), mandatory classified board (CB) laws, and the acceptance/rejection of the Revlon, Unocal, and Blasius standards of review for takeovers. CS and FP laws are omitted from the models due to collinearity with the fixed effects. All variables are defined in Appendix A. *, **, and *** represent statistical significance at the 10%, 5%, and 1% level, respectively.

Panel A: Market's valuation of innovation

	Dependent variable: *ln*(Tobin's *q*)					
Innovation measure =	R&D spending Model 1		Value of patents Model 2		Number of patents Model 3	
	Coefficient	*p*-value	Coefficient	*p*-value	Coefficient	*p*-value
Innovation	0.566***	0.000	0.309***	0.000	0.391***	0.000
COW	-0.049***	0.004	-0.048***	0.000	-0.054***	0.001
COW × Innovation	**-0.123****	**0.022**	**-0.067****	**0.019**	**-0.243*****	**0.000**
NC laws	0.015	0.419	0.012	0.481	0.013	0.445
UD laws	0.025	0.376	0.027	0.359	0.022	0.437
CB laws	0.029	0.269	0.027	0.308	0.024	0.372
BC laws	-0.113***	0.000	-0.115***	0.000	-0.118***	0.000
DD laws	0.063	0.190	0.053	0.302	0.066	0.215
PP laws	-0.005	0.904	-0.004	0.933	-0.011	0.808
Revlon	-0.002	0.822	-0.007	0.330	-0.003	0.652
Unocal	0.062***	0.000	0.061***	0.000	0.064***	0.000
Blasius	-0.019*	0.080	-0.014	0.206	-0.016	0.149
Controls as in Table 2	Panel B Model 1		Panel B Model 3		Panel B Model 5	
N	76,558		76,558		76,558	

Panel B: Inventor mobility

Dependent variable =	Move (0,1) Model 1		Move to a start-up (0,1) Model 2		Superstar move (0,1) Model 3		Superstar move to a start-up (0,1) Model 4	
	Coefficient	*p*-value	Coefficient	*p*-value	Coefficient	*p*-value	Coefficient	*p*-value
COW	**0.012*****	**0.003**	**0.003*****	**0.000**	**0.000**	**0.964**	**0.001*****	**0.000**
NC laws	0.000	0.330	0.000	0.220	0.000	0.713	0.000	0.218
UD laws	-0.019***	0.000	-0.002***	0.000	-0.011***	0.000	-0.002***	0.001
CB laws	-0.012***	0.000	0.002**	0.021	-0.004	0.311	0.002***	0.000
BC laws	0.018***	0.000	0.003***	0.000	0.006**	0.048	0.001	0.193
DD laws	0.005***	0.000	0.000	0.844	0.004	0.302	0.000	0.710
PP laws	-0.010***	0.000	-0.002***	0.000	-0.004	0.176	-0.001	0.285
Revlon	-0.001	0.182	0.000	0.247	-0.001	0.716	0.000	0.689
Unocal	-0.005***	0.000	-0.002***	0.000	-0.003	0.224	-0.001***	0.006
Blasius	0.009***	0.000	0.001***	0.005	0.005	0.138	0.000	0.274
Controls as in Table 3	Panel B Model 1		Panel B Model 2		Panel B Model 3		Panel B Model 4	
N	6,092,123		6,092,123		6,092,123		6,092,123	

Panel C: Productivity of inventors who remain with employers that suffer an inventor departure								
Dependent variable =	Number of patents		Number of citations		Generality		Originality	
	Model 1		Model 2		Model 3		Model 4	
	Coefficient	*p*-value	Coefficient	*p*-value	Coefficient	*p*-value	Coefficient	*p*-value
COW	**-0.005*****	**0.000**	**-0.005*****	**0.005**	**0.001**	**0.367**	**0.004**	**0.173**
NC laws	-0.001	0.403	-0.003**	0.030	-0.010***	0.000	-0.002	0.544
UD laws	0.020***	0.000	0.036***	0.000	0.005*	0.053	0.007	0.111
CB laws	0.004	0.248	-0.014***	0.000	0.006***	0.004	-0.001	0.902
BC laws	0.001	0.917	0.022	0.200	0.011	0.107	0.005	0.605
DD laws	0.038***	0.000	0.008	0.347	0.018***	0.000	0.011	0.353
PP laws	-0.012***	0.001	-0.017***	0.002	-0.008***	0.004	-0.002	0.788
Revlon	-0.010***	0.000	-0.011***	0.000	-0.003***	0.002	-0.001	0.631
Unocal	0.001	0.549	-0.005*	0.067	-0.003*	0.072	-0.002	0.526
Blasius	0.001	0.595	0.018***	0.000	0.000	0.823	-0.003	0.334
Controls as in Table 3	Panel C Model 1		Panel C Model 2		Panel C Model 3		Panel C Model 4	
N	3,471,287		3,471,287		3,471,287		3,471,287	

Panel D: Marginal value of cash				
Dependent variable =	Size and market-to-book adjusted annual excess stock return		Industry adjusted annual excess stock return	
	Model 1		Model 2	
	Coefficient	*p*-value	Coefficient	*p*-value
Δ Cash	1.318***	0.000	1.419***	0.000
COW × Δ Cash	**-0.270*****	**0.002**	**-0.341*****	**0.006**
COW	-0.060	0.225	-0.046	0.248
NC laws	0.005	0.700	-0.008	0.592
UD laws	0.091**	0.016	0.135***	0.006
CB laws	-0.003	0.910	0.080***	0.008
BC laws	-0.053	0.283	-0.110*	0.063
DD laws	0.029	0.776	0.067	0.592
PP laws	0.062	0.284	0.034	0.524
Revlon	0.013	0.620	0.011	0.714
Unocal	0.085***	0.002	0.119***	0.001
Blasius	-0.093***	0.004	-0.095**	0.010
Controls as in Table 4	Panel B Model 1		Panel B Model 3	
N	48,764		48,764	

Panel E: Acquisition decisions						
Dependent variable =	Bid (0,1) Model 1		*ln*(1 + number of bids) Model 2		*ln*(1 + bid value) Model 3	
	Coefficient	*p*-value	Coefficient	*p*-value	Coefficient	*p*-value
COW	**0.008****	**0.027**	**0.008*****	**0.003**	**0.047****	**0.015**
NC laws	0.013**	0.038	0.010**	0.036	0.064*	0.074
UD laws	0.002	0.684	0.002	0.696	0.006	0.823
CB laws	0.002	0.928	0.002	0.919	-0.026	0.857
BC laws	-0.015	0.168	-0.012	0.118	-0.055	0.334
DD laws	-0.011	0.548	-0.006	0.663	-0.069	0.390
PP laws	0.011	0.436	0.011	0.343	0.070	0.246
Revlon	0.008**	0.010	0.002	0.566	0.034**	0.044
Unocal	0.003	0.552	0.003	0.448	0.013	0.601
Blasius	-0.010**	0.023	-0.006*	0.098	-0.047**	0.025
Controls as in Table 5	Panel B Model 1		Panel B Model 3		Panel B Model 5	
N	81,134		81,134		81,134	

Panel F: Acquisition quality						
Dependent variable =	CAR(-1,+1) % Model 1		1 if CAR(-1,+1) < 0, 0 otherwise Model 2		1 for withdrawn deals, 0 otherwise Model 3	
	Coefficient	*p*-value	Coefficient	*p*-value	Coefficient	*p*-value
COW	**-0.883****	**0.043**	**0.039***	**0.074**	-0.020	0.101
CAR(-1,+1)					-0.061**	0.016
COW × CAR(-1,+1)					**0.105****	**0.019**
NC laws	0.107	0.259	0.003	0.340	0.004	0.178
UD laws	-0.688	0.204	0.013	0.697	-0.014	0.292
CB laws	-2.619***	0.000	0.024	0.500	-0.023	0.435
BC laws	-0.149	0.812	0.015	0.526	-0.016	0.221
DD laws	0.776	0.350	-0.038	0.214	-0.011	0.549
PP laws	-0.236	0.758	0.012	0.742	0.036	0.102
Revlon	-0.468	0.318	0.032	0.128	0.010	0.316
Unocal	-0.240	0.476	-0.015	0.382	0.003	0.720
Blasius	-0.288	0.455	0.013	0.481	-0.004	0.749
Controls as in Table 6	Panel B Model 1		Panel B Model 2		Panel B Model 3	
N	4,716		4,716		5,082	

Table 14: High dimensional fixed effects

This table presents the effects of COW law on the market's valuation of innovation in Panel A, inventor mobility in Panel B, innovation productivity in Panel C, marginal value of cash in Panel D, acquisition decisions in Panel E, and acquisition quality in Panel F controlling for (headquarters state × industry × year) fixed effects using the baseline models from the previous tables as specified in each regression. All variables are defined in Appendix A. *, **, and *** represent statistical significance at the 10%, 5%, and 1% level, respectively.

Panel A: Market's valuation of innovation

	Dependent variable: *ln*(Tobin's *q*)					
Innovation measure =	R&D spending Model 1		Value of patents Model 2		Number of patents Model 3	
	Coefficient	*p*-value	Coefficient	*p*-value	Coefficient	*p*-value
Innovation	0.590***	0.000	0.309***	0.000	0.469***	0.000
COW	-0.061***	0.005	-0.063***	0.001	-0.069***	0.003
COW × Innovation	**-0.208*****	**0.000**	**-0.071****	**0.036**	**-0.320*****	**0.000**
Baseline model as in Table 2	Panel B Model 1		Panel B Model 3		Panel B Model 5	
N	76,558		76,558		76,558	

Panel B: Inventor mobility

Dependent variable =	Move (0,1)		Move to a start-up (0,1)		Superstar move (0,1)		Superstar move to a start-up (0,1)	
	Model 1		Model 2		Model 3		Model 4	
	Coefficient	*p*-value	Coefficient	*p*-value	Coefficient	*p*-value	Coefficient	*p*-value
COW	**0.024*****	**0.000**	**0.008*****	**0.000**	**0.010*****	**0.002**	**0.003*****	**0.000**
Baseline model as in	Table 3 Panel B Model 1		Table 3 Panel B Model 2		Table 3 Panel B Model 3		Table 3 Panel B Model 4	
N	6,092,123		6,092,123		6,092,123		6,092,123	

Panel C: Productivity of inventors who remain with employers that suffer an inventor departure

Dependent variable =	Number of patents		Number of citations		Generality		Originality	
	Model 1		Model 2		Model 3		Model 4	
	Coefficient	*p*-value	Coefficient	*p*-value	Coefficient	*p*-value	Coefficient	*p*-value
COW	**-0.011****	**0.024**	**-0.007***	**0.058**	**0.007**	**0.192**	**0.005**	**0.218**
Baseline model as in	Table 3 Panel C Model 1		Table 3 Panel C Model 2		Table 3 Panel C Model 3		Table 3 Panel C Model 4	
N	3,471,410		3,471,410		3,471,410		3,471,410	

Panel D: Marginal value of cash				
Dependent variable =	Size and market-to-book adjusted annual excess stock return Model 1		Industry adjusted annual excess stock return Model 2	
	Coefficient	*p*-value	Coefficient	*p*-value
Δ Cash	1.047***	0.000	1.011***	0.000
COW × Δ Cash	**-0.151****	**0.010**	**-0.113****	**0.049**
COW	-0.043*	0.065	-0.017	0.266
Baseline model as in	Table 4 Panel B Model 1		Table 4 Panel B Model 3	
N	48,764		48,764	

Panel E: Acquisition decisions						
Dependent variable =	Bid (0,1) Model 1		*ln*(1 + number of bids) Model 2		*ln*(1 + bid value) Model 3	
	Coefficient	*p*-value	Coefficient	*p*-value	Coefficient	*p*-value
COW	**0.007****	**0.044**	**0.006****	**0.031**	**0.044****	**0.018**
Baseline model as in Table 5	Panel B Model 1		Panel B Model 3		Panel B Model 5	
N	81,134		81,134		81,134	

Panel F: Acquisition quality						
Dependent variable =	CAR(-1,+1) % Model 1		1 if CAR(-1,+1) < 0, 0 otherwise Model 2		1 for withdrawn deals, 0 otherwise Model 3	
	Coefficient	*p*-value	Coefficient	*p*-value	Coefficient	*p*-value
COW	**-0.672****	**0.014**	**0.028***	**0.060**	-0.001	0.931
CAR(-1,+1)					-0.073*	0.082
COW × CAR(-1,+1)					**0.094****	**0.039**
Baseline model as in Table 6	Panel B Model 1		Panel B Model 2		Panel B Model 3	
N	4,716		4,716		5,082	

Table 15: Matched difference-in-differences

This table presents the effects of COW law on the market's valuation of innovation in Panel A, inventor mobility in Panel B, innovation productivity in Panel C, marginal value of cash in Panel D, acquisition decisions in Panel E, and acquisition quality in Panel F using a matched diff-in-diff design. We match treated firms with control firms on firm size, leverage, operating performance, classified board, managerial ownership, institutional ownership, dividend payments, number of business segments, degree of common ownership, year, two-digit SIC industry, headquarters state for the firm level tests in Panels A, D, E, and F and match on year, tech sector, and headquarters state for the inventor level tests in Panels B and C. In all these tests, we perform propensity score matching using the nearest neighborhood matching method with replacement. All variables are defined in Appendix A. *, **, and *** represent statistical significance at the 10%, 5%, and 1% level, respectively.

Panel A: Market's valuation of innovation

	Dependent variable: *ln*(Tobin's *q*)					
Innovation measure =	R&D spending Model 1		Value of patents Model 2		Number of patents Model 3	
	Coefficient	*p*-value	Coefficient	*p*-value	Coefficient	*p*-value
Innovation	0.547***	0.000	0.306***	0.000	0.398***	0.000
COW	-0.057***	0.003	-0.052***	0.001	-0.059***	0.001
COW × Innovation	**-0.112***	**0.066**	**-0.066****	**0.030**	**-0.255*****	**0.000**
Controls as in Table 2	Panel B Model 1		Panel B Model 3		Panel B Model 5	
N	69,441		69,441		69,441	

Panel B: Inventor mobility

Dependent variable =	Move (0,1)		Move to a start-up (0,1)		Superstar move (0,1)		Superstar move to a start-up (0,1)	
	Model 1		Model 2		Model 3		Model 4	
	Coefficient	*p*-value	Coefficient	*p*-value	Coefficient	*p*-value	Coefficient	*p*-value
COW	**0.010*****	**0.000**	**0.001*****	**0.000**	**0.005*****	**0.000**	**0.001***	**0.093**
Controls as in Table 3	Panel B Model 1		Panel B Model 2		Panel B Model 3		Panel B Model 4	
N	3,809,291		3,809,291		3,809,291		3,809,291	

Panel C: Productivity of inventors who remain with employers that suffer an inventor departure

Dependent variable =	Number of patents		Number of citations		Generality		Originality	
	Model 1		Model 2		Model 3		Model 4	
	Coefficient	*p*-value	Coefficient	*p*-value	Coefficient	*p*-value	Coefficient	*p*-value
COW	**-0.003****	**0.025**	**-0.001*****	**0.000**	**-0.001**	**0.132**	**0.002**	**0.384**
Controls as in Table 3	Panel C Model 1		Panel C Model 2		Panel C Model 3		Panel C Model 4	
N	2,455,612		2,455,612		2,455,612		2,455,612	

Panel D: Marginal value of cash				
Dependent variable =	Size and market-to-book adjusted annual excess stock return Model 1		Industry adjusted annual excess stock return Model 2	
	Coefficient	*p*-value	Coefficient	*p*-value
Δ Cash	1.599***	0.000	1.732***	0.000
COW × Δ Cash	**-0.174****	**0.022**	**-0.230*****	**0.004**
COW	-0.044	0.216	-0.029	0.293
Controls as in Table 4	Panel B Model 2		Panel B Model 4	
N	41,482		41,482	

Panel E: Acquisition decisions						
Dependent variable =	Bid (0,1) Model 1		*ln*(1 + number of bids) Model 2		*ln*(1 + bid value) Model 3	
	Coefficient	*p*-value	Coefficient	*p*-value	Coefficient	*p*-value
COW	**0.007***	**0.063**	**0.007*****	**0.006**	**0.046****	**0.027**
Controls as in Table 5	Panel B Model 1		Panel B Model 3		Panel B Model 5	
N	73,480		73,480		73,480	

Panel F: Acquisition quality						
Dependent variable =	CAR(-1,+1) % Model 1		1 if CAR(-1,+1) < 0, 0 otherwise Model 2		1 for withdrawn deals, 0 otherwise Model 3	
	Coefficient	*p*-value	Coefficient	*p*-value	Coefficient	*p*-value
COW	**-0.845****	**0.034**	**0.025***	**0.082**	-0.026**	0.025
CAR(-1,+1)					-0.114*	0.061
COW × CAR(-1,+1)					**0.203*****	**0.001**
Controls as in Table 6	Panel B Model 1		Panel B Model 2		Panel B Model 3	
N	4,235		4,235		4,621	

Table 16: Stacked difference-in-differences

This table presents the effects of COW law on the market's valuation of innovation in Panel A, inventor mobility in Panel B, innovation productivity in Panel C, marginal value of cash in Panel D, acquisition decisions in Panel E, and acquisition quality in Panel F using a stacked diff-in-diff design. To apply the stacked DiD method, we created nine event-specific datasets that correspond to nine COW passages. Every event dataset consists of firms treated by COW and 'clean' control firms that never experience any COW passage for a nine-year panel by event time (t–4 to t+4) around the corresponding COW passage year t. We ensure that early-treated firms are not used as effective controls for later-treated firms. We then stack all the event-specific datasets in relative time to estimate an average treatment effect across the nine COW passages. All variables are defined in Appendix A. *, **, and *** represent statistical significance at the 10%, 5%, and 1% level, respectively.

Panel A: Market's valuation of innovation

	Dependent variable: *ln*(Tobin's *q*)					
Innovation measure =	R&D spending Model 1		Value of patents Model 2		Number of patents Model 3	
	Coefficient	*p*-value	Coefficient	*p*-value	Coefficient	*p*-value
Innovation	0.824***	0.000	0.271***	0.000	0.338***	0.004
COW	-0.036	0.115	-0.040**	0.050	-0.048**	0.018
COW × Innovation	**-0.310*****	**0.001**	**-0.115*****	**0.000**	**-0.265*****	**0.008**
Controls as in Table 2	Panel B Model 1		Panel B Model 3		Panel B Model 5	
N	89,584		89,584		89,584	

Panel B: Inventor mobility

Dependent variable =	Move (0,1)		Move to a start-up (0,1)		Superstar move (0,1)		Superstar move to a start-up (0,1)	
	Model 1		Model 2		Model 3		Model 4	
	Coefficient	*p*-value	Coefficient	*p*-value	Coefficient	*p*-value	Coefficient	*p*-value
COW	**0.007****	**0.022**	**0.002*****	**0.000**	**-0.013*****	**0.002**	**0.001***	**0.056**
Controls as in Table 3	Panel B Model 1		Panel B Model 2		Panel B Model 3		Panel B Model 4	
N	12,185,669		12,185,669		12,185,669		12,185,669	

Panel C: Productivity of inventors who remain with employers that suffer an inventor departure

Dependent variable =	Number of patents		Number of citations		Generality		Originality	
	Model 1		Model 2		Model 3		Model 4	
	Coefficient	*p*-value	Coefficient	*p*-value	Coefficient	*p*-value	Coefficient	*p*-value
COW	**-0.015*****	**0.000**	**-0.019*****	**0.000**	**-0.015*****	**0.000**	**-0.012*****	**0.000**
Controls as in Table 3	Panel C Model 1		Panel C Model 2		Panel C Model 3		Panel C Model 4	
N	7,161,571		7,161,571		7,161,571		7,161,571	

Panel D: Marginal value of cash

Dependent variable =	Size and market-to-book adjusted annual excess stock return Model 1		Industry adjusted annual excess stock return Model 2	
	Coefficient	*p*-value	Coefficient	*p*-value
Δ Cash	1.701***	0.000	1.763***	0.000
COW × Δ Cash	**-0.374*****	**0.001**	**-0.329*****	**0.000**
COW	-0.062*	0.069	-0.044	0.139
Controls as in Table 4	Panel B Model 2		Panel B Model 4	
N	55,705		55,705	

Panel E: Acquisition decisions

Dependent variable =	Bid (0,1) Model 1		*ln*(1 + number of bids) Model 2		*ln*(1 + bid value) Model 3	
	Coefficient	*p*-value	Coefficient	*p*-value	Coefficient	*p*-value
COW	**0.009****	**0.050**	**0.007****	**0.040**	**0.039***	**0.075**
Controls as in Table 5	Panel B Model 1		Panel B Model 3		Panel B Model 5	
N	95,655		95,655		95,655	

Panel F: Acquisition quality

Dependent variable =	CAR(-1,+1) % Model 1		1 if CAR(-1,+1) < 0, 0 otherwise Model 2		1 for withdrawn deals, 0 otherwise Model 3	
	Coefficient	*p*-value	Coefficient	*p*-value	Coefficient	*p*-value
COW	**-1.205****	**0.017**	**0.072*****	**0.006**	-0.039***	0.003
CAR(-1,+1)					-0.107	0.112
COW × CAR(-1,+1)					**0.194****	**0.027**
Controls as in Table 6	Panel B Model 1		Panel B Model 2		Panel B Model 3	
N	9,270		9,270		9,857	

Appendix A: Variable definitions

Variable	Definition	Source
	Main independent variable	
COW	One if the firm is incorporated in a state which has passed a Corporate Opportunity Waivers law by the fiscal year end date, and zero otherwise.	Rauterberg and Talley (2017)
	Analysis of the market's valuation of innovation	
Tobin's *q*	Market value of assets over book value of assets: $(at - ceq + csho \times prcc\_f)/at$	Compustat
R&D spending	R&D/assets (*xrd/at*, set to 0 if missing)	Compustat
Value of patents	total dollar value of patents granted in the year scaled by assets	Kogan *et al* (2017)
Number of patents	total number of patents granted in the year scaled by assets	Kogan *et al* (2017)
	Analysis of inventor mobility and innovation activity	
Move (0,1)	One if an inventor moves to another firm in a year and zero otherwise	USPTO, Kogan *et al* (2017)
Move to a start-up (0,1)	One an inventor moves to a startup in a year and zero otherwise. We code an employer as a startup if it is a first-time patent assignee private company.	USPTO, Kogan *et al* (2017)
Superstar move (0,1)	One if a superstar inventor moves to another firm in a year and zero otherwise. We define "superstar" inventors as those in the top 25% of all sample inventors in terms of the number of patents granted by the USPTO.	USPTO, Kogan *et al* (2017)
Superstar move to a start-up (0,1)	One if a superstar inventor moves to a startup in a year and zero otherwise	USPTO, Kogan *et al* (2017)
Number of patents	The number of patents filed by an inventor in a year. In the regressions, this variable is adjusted for truncation bias using the method in Hall, Jaffe, and Trajtenberg (2002), plus one and natural logarithm transformed.	USPTO, Kogan *et al* (2017)
Number of citations	The number of citations for the patents filed by an inventor in a year. In the regressions, this variable is adjusted for truncation bias using the method in Hall, Jaffe, and Trajtenberg (2002), plus one and natural logarithm transformed.	USPTO, Kogan *et al* (2017)
Generality	One minus the Herfindahl concentration index of the number of patents citing across technological classes. We use the bias correction of the Herfindahl measures, described in Jaffe and Trajtenberg (2002), to account for cases with a small number of patents within technological categories	USPTO, Kogan *et al* (2017)
Originality	One minus the Herfindahl concentration index of the number of cited patents across technological classes. We use the bias correction of the Herfindahl	USPTO, Kogan *et al* (2017)

	measures, described in Jaffe and Trajtenberg (2002), to account for cases with a small number of patents within technological categories.	
Tech sector	The most dominant Cooperative Patent Classification (CPC) class using the "section symbol" among all patents filed in the firm in the most recent five years	USPTO, Kogan *et al* (2017)
	Analysis of the marginal value of cash holdings	
Size and M/B adjusted annual excess stock return	Firm-level stock returns minus Fama-French size and book-to-market (5 x 5) matched portfolio returns	CRSP and Ken French's web site
Industry-adjusted annual excess stock return	Firm-level stock returns minus Fama-French (1997) 48 industry value weighted returns	CRSP, Ken French's web site
Leverage	Total debt (dltt + dlc)/Market value of total assets (*at* − *ceq* + *csho* × *prcc_f*)	Compustat
Δ Cash	Change in cash (*che*)	Compustat
Δ Earnings	Change in earnings before extraordinary items (*ib* + *xint* + *txdi* + *itci*)	Compustat
Δ Net assets	Change in net assets (*at* − *che*)	Compustat
Δ R&D	Change in R&D (*xrd*, set to 0 if missing)	Compustat
Δ Interest	Change in interest (*xint*)/	Compustat
Δ Dividends	Change in common dividends (*dvc*)	Compustat
Net financing	New equity issues (*sstk* − *prstkc*) + Net new debt issues (*dltis* − *dltr*)	Compustat
	Analysis of acquisitions	
Bid (0,1)	One if the firm makes an M&A bid in a given year	SDC, Compustat
Number of bids	The total number of M&A bids made by the firm in a given year	SDC, Compustat
Bid value	The total value of all M&A bids made by the firm in a given year	SDC, Compustat
CAR(-1,+1)	Three-day cumulative abnormal return calculated using excess stock return over CRSP value weighted return relative to the announcement date (day 0)	CRSP
Size	Natural logarithm of market value of equity (*csho* × *prcc_f*)	Compustat
Leverage	Total debt/Market value of total assets: (dltt + dlc)/(*at* − *ceq* + *csho* × *prcc_f*)	Compustat
Tobin's *q*	Market value of assets over book value of assets: (*at* − *ceq* + *csho* × *prcc_f*)/*at*	Compustat
Liquidity	Natural logarithm of one plus the average of the daily Amihud (2002) illiquidity measure over the fiscal year, multiplied by minus one	CRSP
ROA	Return on assets (*oibdp*/*at*)	Compustat

Relative size	Deal value/Acquirer's market value of equity two days before the deal announcement	SDC, Compustat
Private target	One for private targets, zero otherwise	SDC
Subsidiary target	One for subsidiary targets, zero otherwise	SDC
All cash payment	One for purely cash financed deals, zero otherwise	SDC
Tender offer	One for tender offers, zero otherwise	SDC
Hostile deal	One for hostile deals, zero otherwise	SDC
Competed deal	One for competed deals, zero otherwise	SDC
Toehold	One if the acquirer owns shares in the target before the deal announcement, zero otherwise	SDC
Lock up	One if the deal includes a lockup of target shares, zero otherwise	SDC
Merger of equals	One if the deal is a merger of equals, zero otherwise	SDC
Diversifying deal	One if the acquirer and the target do not belong to the same 2-digit SIC	SDC, Compustat
	Additional firm and governance control variables	
Classified board	One if the firm has a staggered board, zero otherwise. The data are collected for nearly all US public firms by scraping DEF14 filings and applying machine learning technique.	Guernsey, Sepe, and Serfling (2022)
Managerial ownership	Ownership of the CEO as a proportion of the number of shares outstanding	Execucomp, Thomson Insider
Active institution ownership	Total ownership of active institutional blockholders that own at least 5% of the number of shares outstanding in the firm and are classified as "dedicated" by Bushee's institutional classification	13F, Compustat, Bushee's website
Dividend paying	One if the firm pays dividend during the year	Compustat
Number of segments	The number of business segments of the firm	Compustat
Common ownership	the average common ownership between the firm and all other firms with common ownership, which is defined following Gilje, Gormley, and Levit (2020). We require that common investors own at least 1% of the number of shares outstanding in the firms and assume a linear function for investor attention.	13F, Compustat
	Additional legal control variables	
NC laws	The non-compete index which measures the enforceability of non-compete agreements in various states	Garmaise (2011) and Guernsey, Sepe, and Serfling (2022)
UD laws	One for the firm-year in which the firm's incorporation state passed the universal demand laws	Bourveau, Lou, and Wang (2018)
CB laws	One for the firm-year in which the firm's incorporation state passed the mandatory staggered board laws	Karpoff and Wittry (2018)

CS laws	One for the firm-year in which the firm's incorporation state passed the control share acquisition laws	Karpoff and Wittry (2018)
BC laws	One for the firm-year in which the firm's incorporation state passed the business combination laws	Karpoff and Wittry (2018)
FP laws	One for the firm-year in which the firm's incorporation state passed the fair price laws	Karpoff and Wittry (2018)
DD laws	One for the firm-year in which the firm's incorporation state passed the directors' duties laws	Karpoff and Wittry (2018)
PP laws	One for the firm-year in which the firm's incorporation state passed the poison pill laws	Karpoff and Wittry (2018)
Revlon	One if the Revlon standard is adopted by the state on a given date, minus one if it is rejected by the state on a given date, and zero otherwise	Cain, McKeon, and Solomon (2017)
Unocal	One if the Unocal standard is adopted by the state on a given date, minus one if it is rejected by the state on a given date, and zero otherwise	Cain, McKeon, and Solomon (2017)
Blasius	One if the Blasius standard is adopted by the state on a given date, minus one if it is rejected by the state on a given date, and zero otherwise	Cain, McKeon, and Solomon (2017)
	Analysis of IPO activity	
IPO volume	The natural logarithm of (the number of IPOs by firms incorporated in each state in a calendar year scaled by the number of public firms in the state at the end of the previous calendar year)	SDC, Jay Ritter's IPO data website
VC-backed IPO volume	The natural logarithm of (the number of venture capital backed IPOs by firms incorporated in each state in a calendar year scaled by the number of public firms in the state at the end of the previous calendar year)	SDC, Jay Ritter's IPO data website
State GDP growth	The annual growth rate in each state GDP per capita during year before the calendar year of the observation	Bureau of Economic Analysis
State population	The natural logarithm of one plus the state's population at the year-end before the calendar year of the observation	Bureau of Economic Analysis
State employment	The natural logarithm of one plus the state's employment at the year-end before the calendar year of the observation	Bureau of Economic Analysis
State firm stock return	The value-weighted stock return of all firms in the state in the previous calendar year	CRSP, Compustat
State market-to-book ratio	The value-weighted market-to-book ratio of all firms in the state in the previous calendar year	CRSP, Compustat

Appendix B: Additional analyses and robustness tests

B.1. The effect of waiver laws on emerging businesses

The rationale underlying the promulgation of COW laws by some state legislatures was to afford contractual flexibility to developing firms (e.g., start-ups) seeking to contract with parties with overlapping interests. Without the waiver, directors, officers and other firm fiduciaries are legally bound by the duty of loyalty to offer their board of directors the chance to first refuse a business opportunity that may benefit the corporation. Thus, parties with overlapping activities would be unwilling to contract with emerging firms for fear of being in a position of conflicting, yet inviolable duties of loyalty. Conversely, with the waiver law in place, venture capital and private equity firms could provide emerging enterprises with both financial and intellectual capital without concerns about conflicts of interests related to the duty of loyalty. The above discussion suggests that, if the waiver laws work as intended, they should benefit small and young enterprises. This benefit would have a direct effect on small firms and could have an indirect effect on large firms as the contracting flexibility reduces small firm reliance on large firms for financial and intellectual capital to develop their innovation. This would imply a redistribution of innovation exploitation from large to small firms.

The redistribution effect is inherently impossible to directly measure, as the total magnitude of innovation can be changing simultaneously with the distribution of the shares of that innovation. Nonetheless, we can provide several pieces of indirect evidence. In this section, we test the overall conjecture that small firms benefited from the waiver laws by evaluating the investor reactions to the enactment of COW laws, firms' change in return on assets (ROA) following the laws, and by examining the incidence of initial public offerings (IPOs) around COW laws. We further provide evidence on the potential indirect redistribution effect by examining the incidence of joint ventures and strategic alliances following waiver law enactments, as well as shifts in institutional ownership.

B.1.1. Event study around the passing of COW laws

Rauterberg and Talley (2017, p.1140) show that investor reactions around the enactment of COW laws range from 0.4% to 0.8%. We estimate three-day average cumulative abnormal returns (CARs) as the cumulated residuals from a market model calculated during the one-year window ending four weeks prior to the law enactment day (date 0). We estimate mean CARs for the 4,359 firms incorporated in states that pass a COW law. To assess whether the market's reaction to COW enactments varies according to firm size, we also estimate mean CARs for subsets of large, mid, and small capitalization stocks, respectively. According to Kolari and Pynnönen (2010), when evaluating several firms affected by a common event during the same date, even a relatively low cross-correlation among abnormal returns is serious in terms of over-rejecting the null hypothesis of zero average abnormal returns. To address this issue, our event study uses the standardized cross-sectional method of Boehmer, Musumeci, and Poulsen (1991) correcting for cross-sectional correlation following Kolari and Pynnönen (2010).

Figure B.1 plots the event study results. We note that the average three-day CAR around COW enactment is 1.01% (p-value = 0.001) which is close to the upper range of 0.8% reported by Rauterberg and Talley (2017). More importantly, the figure also reveals that the positive reaction is driven by the cohort of small cap stocks. These firms exhibit an average CAR of 1.26% (p-value = 0.001). In contrast, the reaction to both large- and mid-cap stocks is not statistically significant. In fact, a t-statistic of 4.38 indicates that the mean CAR accruing to small cap firms is significantly larger than the mean CAR we estimate for mid and large cap firms combined. This evidence suggests that investors view the enactment of waiver laws as particularly beneficial for the smallest firms in the stock market.

The cohort of mid- and large-capitalization firms exhibit a muted market response upon the passing of COW laws. Despite this result, there are prominent anecdotes involving the misappropriation of corporate opportunities in large firms. For example, a well-publicized derivative lawsuit filed in 2002 accused certain eBay shareholders and insiders of usurping a corporate opportunity and breaching their fiduciary duties. The complaint alleged that eBay's investment bank, Goldman Sachs, provided profitable IPO allocations to favored parties.[28] The presiding judge, William Chandler, noted that these defendants "were not free to accept this consideration…" and that the complaint raised "a reasonable inference that the insider directors accepted a commission or gratuity that rightfully belonged to eBay but that was improperly diverted to them." In 2018, shareholders of athletic apparel maker Under Armour sued its CEO, Kevin Plank, alleging he breached his fiduciary duty by "usurping a corporate opportunity" from Under Armour. According to the complaint, Mr. Plank bought land for a future corporate campus, and then steered the firm to purchase it from him at an excessive price.[29] In a recent case that was ultimately settled out of court, Alphabet (a.k.a. Google) filed a lawsuit against Uber alleging that one of its engineers, Anthony Levandowski, misappropriated key self-driving technology before he left to start the self-driving truck firm "Otto," which was later acquired by Uber.[30] Overall, the anecdotes just described illustrate that larger firms are not immune to the usurpation of corporate opportunities by fiduciaries and therefore are susceptible to laws that facilitate such usurpation.

We further estimate a regression to explain the firm-level reaction to the law passage, based on that firm's size and R&D spending. The regression includes state and 2-digit SIC fixed-effects. Equation (3) provides the resulting regression coefficient estimates and corresponding *p*-values in parentheses for the firm characteristics.

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[28] See: eBay, Inc. Shareholders' Litigation No. C.A. 19988-NC, 2004 WL 253521 (Del. Ch. Jan. 23, 2004) and "eBay officials draw judge's ire; Holders' suit is allowed to stand," *Wall Street Journal*, Eastern Ed.; 26 Jan 2004: C.2.

[29] See: "Second Port Covington lawsuit filed against Kevin Plank by Under Armour shareholder," *Baltimore Sun*, May 01, 2018, and Under Armour, Inc. S'holder Derivative Litig., No. CV GLR-18-1084, 2020 WL 1505575 (D. Md. Mar. 30, 2020).

[30] See: Waymo LLC v. Uber Techs., Inc., No. 17CV00939WHAJSC, 2017 WL 2864854 (N.D. Cal. July 5, 2017), https://www.cnbc.com/2017/02/23/google-just-sued-uber--and-it-all-stemmed-from-an-email-fail.html, and https://money.cnn.com/2018/02/10/technology/waymo-uber-what-we-learned/index.html

$$\underset{(0.045)}{\text{CAR} = 0.832\ \text{Small}} - \underset{(0.023)}{17.755\ \text{R\&D}} + \underset{(0.024)}{17.566\ (\text{Small} \times \text{R\&D})} \tag{3}$$

Small is defined as in Figure B.1 (market capitalization less than \$3 billion). The coefficients confirm that investors viewed the contracting flexibility as beneficial for small firms. Notably, investors also anticipated the potential for loss of capture for innovation (documented in Table 3) with a significantly negative coefficient on R&D, which translates into a decrease in the CAR of 0.129 ×17.755 = 2.26% for a one standard deviation increase in R&D. This effect is offset for small firms, such that investors still viewed the COW-provided contracting flexibility as positive for them.

B.1.2. ROA after COW law enactment

We next examine ROA after the enactment of a COW law. If the market's assessment of the implications of the COW law, as evidenced in equation (3) above, is correct, we expect to see a decrease in ROA for R&D-intensive large firms (but not for R&D intensive small firms) after COW laws are enacted. We therefore calculate the average ROA during the three years after a COW law passes minus the average ROA during the three previous years. This change, ΔROA, is the dependent variable in the regression described by equation (4) which is otherwise specified as equation (3).

$$\underset{(0.033)}{\Delta\text{ROA} = 0.014\ \text{Small}} - \underset{(0.048)}{0.225\ \text{R\&D}} + \underset{(0.010)}{0.292\ (\text{Small} \times \text{R\&D})} \tag{4}$$

The results in equation (4) are consistent with the event study evidence. The estimate on R&D is negative indicating a drop in ΔROA of 0.129 x 0.225 = 2.9% for a one standard deviation increase in R&D. This adverse effect is absent for small firms suggesting that the contracting flexibility related to a COW law is indeed favorable for small firms. Importantly, the findings based on accounting data imply that investors rationally assessed the impact of COW laws upon their announcement.

B.1.3. IPO activity around the enactment of COW laws

If COW laws are working as intended, then emerging firms should be more likely to contract with parties (such as venture capital (VC) firms). Because these parties supply financial capital and business advice to several growing enterprises, they are at risk of violating their duty of loyalty with the companies they back in the absence of the waiver. There are at least two testable predictions that follow from enhancing the ability of emerging firms to contract with their suppliers of capital. The first is that the contracting flexibility afforded by the COW laws should manifest in an increase in the number of emerging businesses entering the stock market through IPOs. The second prediction is that the incidence of VC-backed IPOs should be higher in states with waiver laws.

To test our predictions, we obtain data from Jay Ritter's website for IPOs that occur from 1996 until 2018. For 6,117 IPOs, we retrieve the state of incorporation from Compustat to create a panel dataset of 1,173 state-year observations. For every incorporation state in each calendar year, we aggregate the number of IPOs (IPO volume). We use an analogous process for venture capital backed IPOs.

Panel A of Table B.1 presents the summary statistics for our IPO activity sample. Lowry (2003) reports that the mean annual growth rate in GDP for her sample is 2.93%. At 3%, the average GDP growth in our sample is similar. Moreover, Lowry also finds a median market-to-book ratio of 2.47 for her IPO sample which is close to the median ratio of 2.65 we estimate for the same variable. Notably, 37.6% of our IPO observations are VC-backed, close to the 40% rate of VC-backed IPO reported by Çolak, Durnev, and Qian (2017).

In Panel B of Table B.1, we present four DiD regressions to evaluate IPO activity around the promulgation of COW laws. Following Lowry (2003), the dependent variable in models 1 and 2 is the natural logarithm of the ratio of the number of IPOs in the state of incorporation to the total number of public firms incorporated in the same state as of the previous year. The dependent variable in models 3 and 4 is the natural logarithm of the ratio of the number of VC-backed IPOs in the state of incorporation to the total number of public firms incorporated in the same state as of the previous year. The key independent variable, COW, is an indicator set to one if the waiver law is in effect and set to zero if it is not. The even-numbered regressions include control variables similar to those in existing IPO work (e.g., Lowry, 2003 and Çolak, Durnev, and Qian, 2017) and all tests include state and calendar year fixed effects.

The results indicate that IPO volume does not increase after the enactment of COW laws. This happens regardless of whether the IPO is VC-backed.[31] These findings do not support the conjecture that the contracting flexibility afforded by the COW laws should manifest in an increase in the number of emerging firms entering the stock market through IPOs in general and VC-backed IPOs in particular. Nevertheless, contemporaneous work by Eldar, Grennan, and Waldock (2021) suggests that emerging firms are deriving other benefits from the COW laws. Using COW laws as an instrument for common ownership, those authors find that on average, startups incorporated in COW states are 11.8 percentage points more likely to have a within-industry common VC owner after the law change. Moreover, Eldar *et al*. also find that startups held by common VC owners are less likely to fail and more likely to exit through an IPO at a higher valuation. Thus, while COWs are not associated with a meaningful increase in IPO activity (Table B.1) they are related to an increase in the quality of some IPOs (Eldar *et al*., 2021).

B.1.4. Joint ventures and strategic alliances after COW law enactment

If COW contracting flexibility reduced emerging firms' reliance on large firms for growth and exploitation of innovation, one manifestation would be a decrease in the incidence of joint

[31] Our control variables yield estimates that are consistent with prior work. For instance, as Çolak, Durnev, and Qian (2017), state GDP growth is positively associated with IPO activity. Moreover, in line with Lowry (2003), we find that IPO activity increases during higher valuation periods.

ventures and strategic alliances. Table B.2 presents the results of a regression to explain the start of a joint venture or strategic alliance, with the primary variable of interest being the indicator that the firm is incorporated in a state that has passed a COW law. The coefficient on the COW indicator is a significant and negative, one percent. Compared to the 9.5% unconditional probability of starting a joint venture or strategic alliance, this represents an 11% decrease, which is economically substantial, and is consistent with the prediction that the contracting flexibility reduced emerging firms' reliance on larger firms to exploit their innovation.

B.1.5. Institutional ownership after COW law enactment

The event study results suggest that market participants anticipated the disparate impact of the law on small and large firms. As a complementary test, we examine institutional ownership following a COW law enactment. If large firm capture of innovation is expected to decrease, then we expect institutions to shift their ownership to follow the innovation capture to smaller firms. We regress institutional ownership on a COW law indicator, a small cap indicator and their interaction. The regression includes state x year, industry x year and firm fixed effects. Equation (5) provides the resulting regression coefficient estimates and corresponding *p*-values.

$$\text{Institutional ownership} = \underset{(0.023)}{-0.037}\ \text{Small} \underset{(0.076)}{-0.019}\ \text{COW} + \underset{(0.000)}{0.039}\ (\text{Small} \times \text{COW}) \tag{5}$$

The joint effect of COW + Small × COW is 0.02 and is significant with a *p*-value of less than 0.001. Thus, whereas small firms typically have less institutional ownership than other firms, post-COW enactment, their institutional ownership increases. The negative coefficient on COW by itself suggests that this is a redistribution of institutional ownership from larger firms. These results complement and are consistent with the implications of the event study for the value of large versus small firms.

B.2. Methodological concerns

Using difference-in-differences (DiD) estimation, we compare changes in innovation, in the marginal value of cash, and in acquisition decisions and performance among firms incorporated in states that pass a COW law with changes in the same variables among firms incorporated elsewhere. There are two econometric issues that are known to threaten the reliability of DiD estimates: lack of parallel trends and serial correlation. In addition, we are sensitive to the possibility that the existing legal regime in a state can alter the effect of the waiver laws. We address these concerns in this section.

B.2.1. Parallel trends

A potential concern with our experimental design is whether events other than a COW law might be driving our results. A related problem is whether the state's adoption of corporate opportunities waiver legislation is anticipated. These issues illustrate violations of the parallel trends assumption which needs to be satisfied to ensure the internal validity of DiD models. This assumption requires that in the absence of the treatment (e.g., the enactment of a COW law), the difference between the 'treatment' and 'control' group is constant over time. Although the parallel trends assumption is not truly testable, we use the falsification method recommended by Roberts and Whited (2013) to check whether the change in the outcome variables we document in the preceding analyses occur only *after* COW laws are enacted, but not *before*.

We perform falsification regression analyses of the pre- and post-trends in our outcome variables. For this purpose, we construct indicator variables that assign each COW law event a placebo date one year (y - 1) and two years (y - 2) *before* the year of their actual promulgation (i.e., $y + 0$). We define analogous variables *after* COW laws pass (i.e., ($y + 1$), ($y + 2$), ($y + 3^{+}$)).

We use these indicator variables to re-estimate regressions that are specified as those in Tables 2, 4, 5, and 6. The falsification tests appear in Table B.3.

Panel A in Table B.3 presents three Tobin's q regressions that augment the specification in Table 2 with the placebo indicators as independent variables. The results of these tests indicate that innovation activity, proxied by R&D spending (model 1), patent output (model 2) and patent value (model 3), contributes less to the market value of the firm *once* COW laws pass, but not earlier. In Panel B, we use the placebo indicators to expand the marginal value of cash models we estimate in Table 4. These expanded regressions show that the value of an extra dollar declines only *after* COW laws are effective, regardless of whether the dependent variable is estimated as the size and market-to-book adjusted annual excess stock return (model 1) or as the industry adjusted annual excess stock return (model 2). In analyses similar to those in Panel B of Table 5, the tests in Panel C of Table B.3 use the placebo indicators to show that firms are both more likely to become acquirers and to undertake more expensive takeovers after their state of incorporation enacts a COW law, but not before. Lastly, in Panel D of Table B.3, we use the placebo variables to rerun the acquisition performance regressions reported in Panel B of Table 6. These tests show that investors' reactions to M&A announcements accruing to bidding firms are lower after COW laws pass (model 1), that once states ratify a COW law, firms are more likely to make bids that generate negative stock market reactions (model 2), and that the same firms are less likely to withdraw such bids (model 3).

Altogether, the pre- and post-trend findings in Table B.3 generate inferences congruent with those from our main empirical analyses: COW laws lower corporate innovation thereby cutting organic growth, depressing the value of the firm's internal slack, and forcing second-best growth through acquisitions. Importantly, the results in Table B.3 suggest that our analyses satisfy the parallel trends assumption.

B.2.2. Serial correlation and inflated t-statistics

Another non-trivial problem that often undermines the reliability of DiD estimates is that inflated *t*-statistics could arise because serial correlation generates standard errors that understate the standard deviation of the treatment effect (Bertrand, Duflo, and Mullainathan, 2004). We address this issue with the nonparametric permutation test method endorsed by Chetty, Looney, and Kroft (2009). Those authors argue that, since these tests make no parametric assumptions about the error structure, they are not vulnerable to the over-rejection bias of the *t*-test when serial correlation occurs.

Following Chetty *et al*. (2009), we randomly assign a firm in our sample to a state that has passed a corporate opportunities waiver law to create our placebo test group. Afterwards, we re-estimate all the baseline tests, treating the placebo group as the actual treatment group. For every outcome variable, we repeat this process 2,000 times using a different random number generator seed for every iteration. We record each estimate to plot the cumulative distribution function (cdf) plots in Figure B.2 for every outcome variable. The plots in Figure B.2 are organized as follows. Panels A, B, C, D, E, and F present the cdf plots that correspond to the outcome variables we use in Table 2 Panel B, Table 3 Panel B, Table 3 Panel C, Table 4 Panel B, Table 5 Panel B, and Table 6 Panel B, respectively. To provide a benchmark, we overlay a vertical line in each cdf figure to show the original regression coefficient from the corresponding baseline model.

Contrasting the cdf plots in Figure B.2 to their corresponding regression coefficients suggests that our analyses are not susceptible to serial correlation and inflated *t*-statistics. For example, looking at the R&D spending plot in Panel A of Figure B.2, 78 out of the 2,000 (3.9%) placebo coefficients are smaller than the reported estimated effect (-0.123) from Panel B of Table 2 (Model 1). In Panel D, for the industry-adjusted marginal value of cash plot, 18 out of 2000 (0.9%) of the placebo coefficients are smaller than the estimated effect in Panel B of

Table 4, Model 4 (-0.120). According to the bid (0,1) plot in Panel E of Figure 3, 94 of the placebo estimates (4.7%) are larger than the 0.008 coefficient from Table 5 Panel B Model 1. Likewise, in the probability that a "COW bidder" earns a negative M&A announcement CAR in Panel D, 66 of the 2000 placebo coefficients (3.3%) are larger than the actual parameter estimate in Table 6 Panel B Model 2 (0.03). Chetty *et al*. (2009) note that the identified percentage of the placebo coefficients that is contrasted with the treatment is like a *p*-value, which should yield statistical inferences like those from the actual regression *p*-values. Since this is the case in all the plots in Figure 3, the permutation tests lessen concerns about serial correlation and understated standard errors driving our baseline results.

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Figure B.1: Market reaction to COW adoptions

This figure presents the stock market reaction to 4,359 firms incorporated in the states that passed of Corporate Opportunity Waivers law on the law's passage date. We estimate the cumulative abnormal return using the market adjusted method for all firms and for subsamples of large cap, mid cap, and small cap firms. Large cap firms are those with a market value of equity of more than US$10 billion. Mid cap firms are those with a market value of equity between US$3 billion and US$10 billion. Small cap firms are those with a market value of equity of less than US$3 billion.

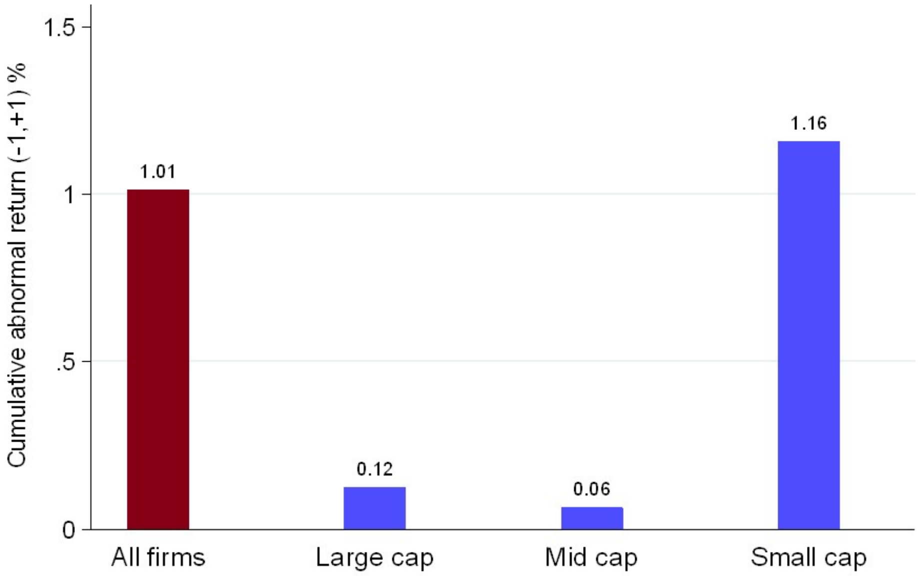
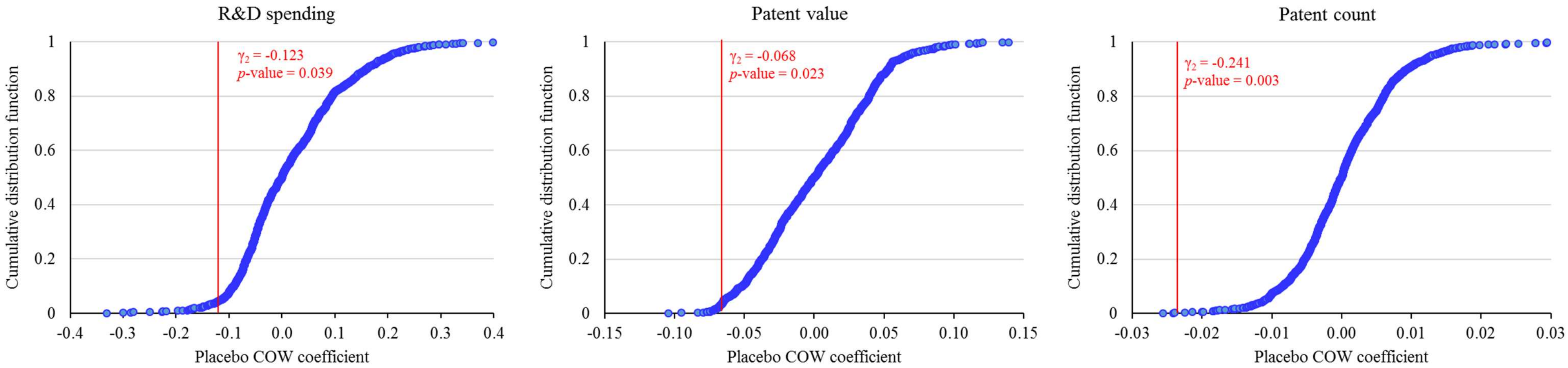


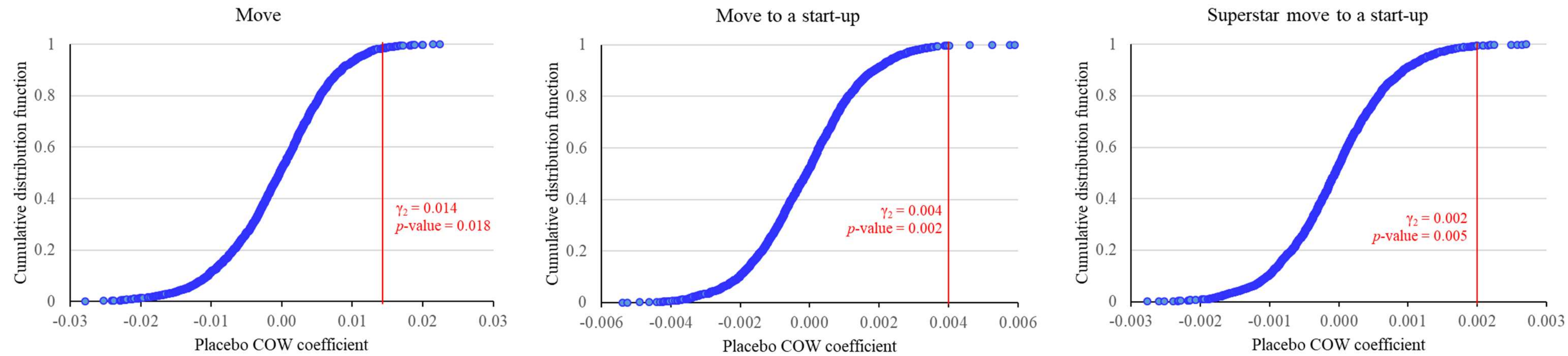
Figure B.2: Block permutation tests

This figure presents the outcome of the block permutation procedure following the method in Chetty, Looney, and Kroft (2009). In each iteration, the COW law treatment variable is randomly re-assigned by state and year without replacement as a placebo through the sample period. Our main regressions of the outcome variables are then estimated on the falsified data. The plots report the empirical cumulative distribution function (cdf) generated from running each of the regression models in 2,000 random iterations of this procedure and capturing the placebo coefficient estimate (γ_2, p) of the falsified COW law dummy (or its interaction) and the outcome variables (the market's valuation of innovation in Panel A, inventor mobility in Panel B, innovation productivity in Panel C, marginal value of cash in Panel D, acquisition decisions in Panel E, and acquisition quality in Panel F) using regressions from Table 2 Panel B Models 1, 3, and 5, Table 3 Panel B Models 1, 2, and 4, Table 3 Panel C Models 1 and 2, Table 4 Panel B Models 2 and 4, Table 5 Panel B Models 1, 3, and 5, and Table 6 Panel B Models 1, 2, and 3, respectively. The vertical line indicates the position of the actual coefficient estimate for the impact that COW law has on the outcome variables and implied p-value when placed in the context of cdf. The implied p-value reported in each plot shows the proportion of the placebo coefficients that are contrasted with the actual regression coefficient.

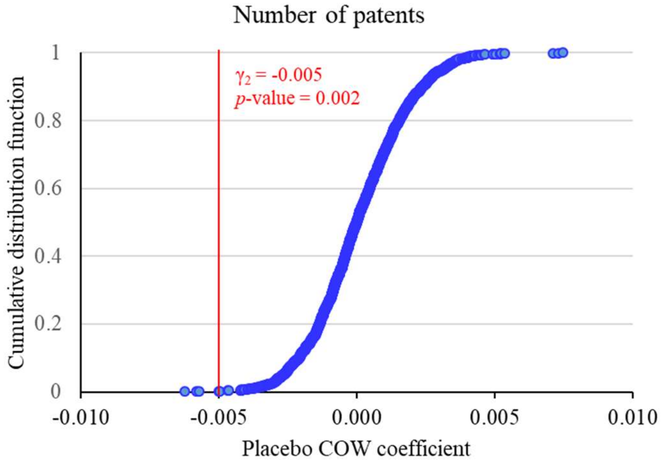
Panel A: Market's valuation of innovation

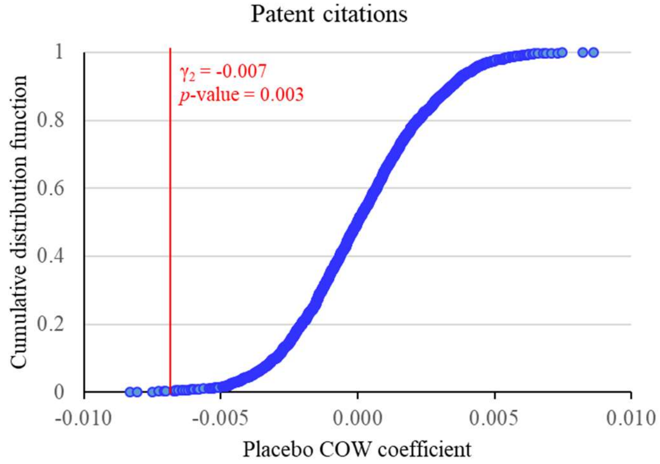


Panel B: Inventor mobility

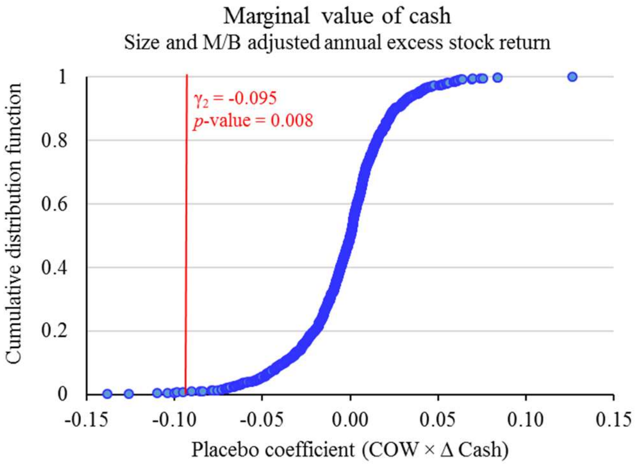


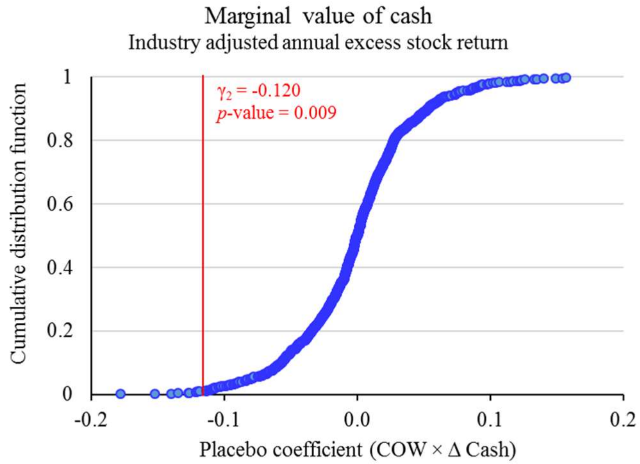
Panel C: Inventor productivity



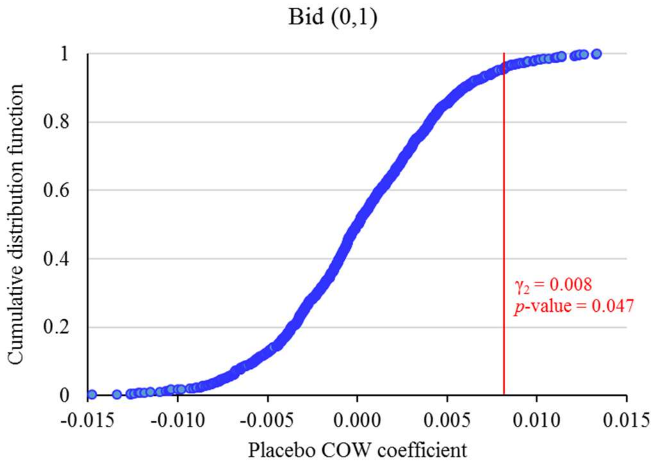


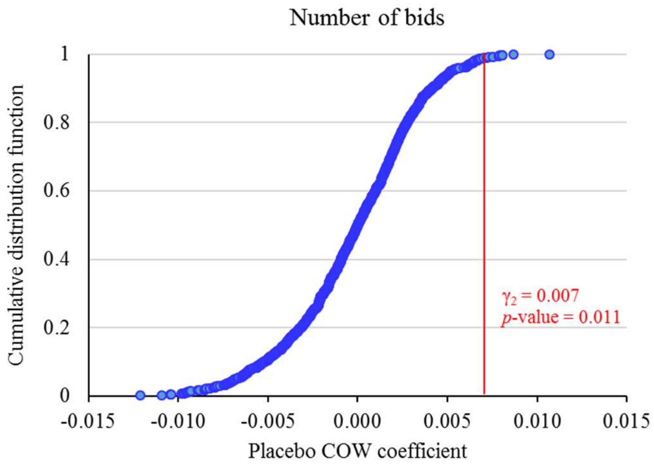
Panel D: Marginal value of cash

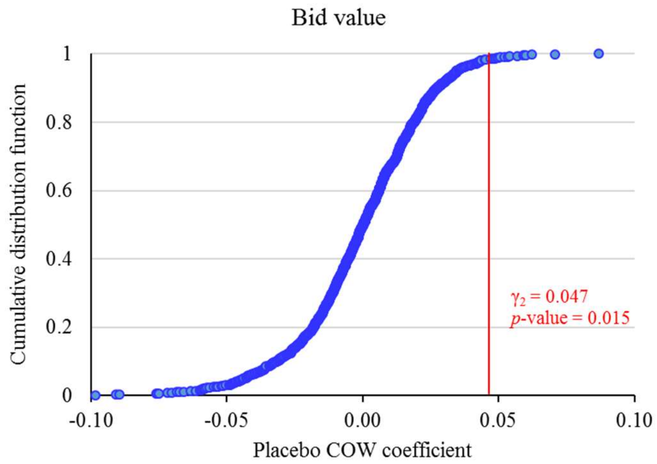




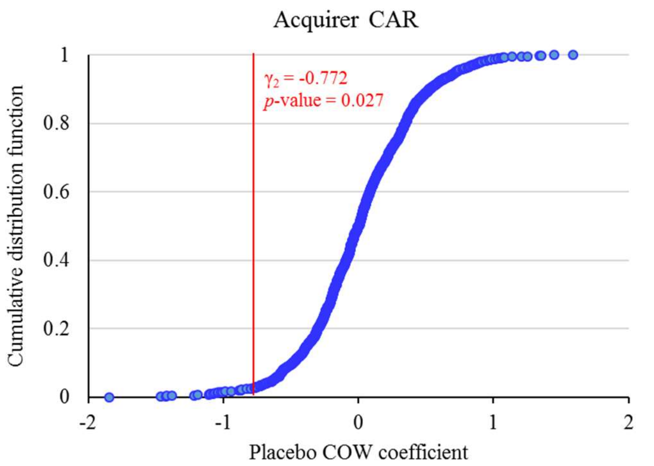
Panel E: Acquisition decisions

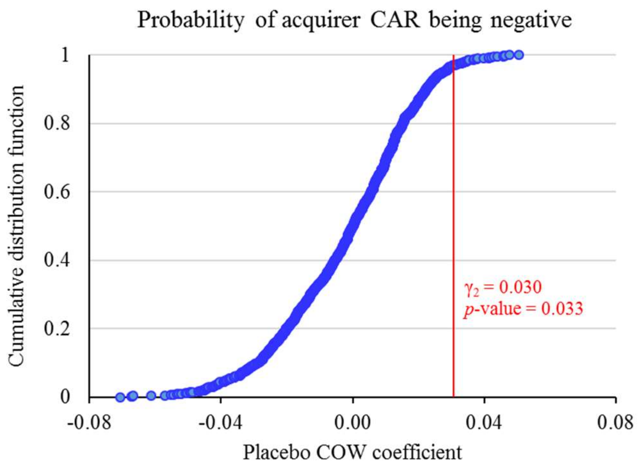






Panel F: Acquisition quality





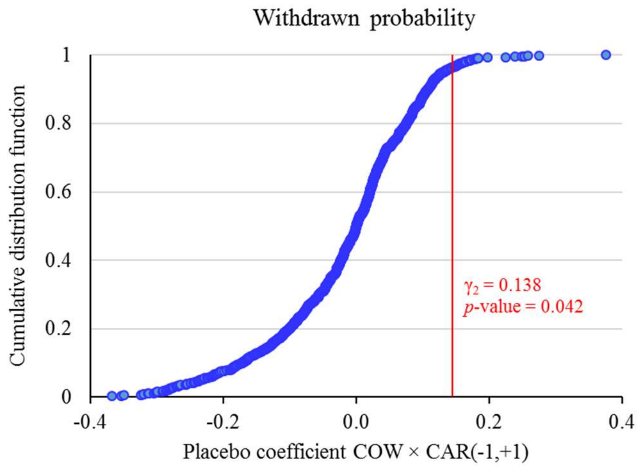


Table B.1: IPO activity

This table analyzes IPO activity by firms incorporated in states that pass a Corporate Opportunity Waivers law. In Panel A, we provide summary statistics of data we use to analyze IPO activity. We obtain the IPO sample from Jay Ritter's IPO data website. The sample consists of 6,398 IPOs during 1996-2018, in which we are able to match 6,117 IPOs with Compustat data to get the state of incorporation for each IPO firm. We construct a panel dataset at the state level for each calendar year. The panel data has 1,173 state-year observations. We then match each IPO to the state-year panel dataset based on the calendar year of IPO offer date and IPO firm's incorporation state. We then count the number of IPOs (IPO volume) by firms incorporated in each state in each calendar year. We also do the same for venture capital (VC) backed IPOs. COW is one for the state-year observation in which the Corporate Opportunity Waivers law is effective at the beginning of the calendar year, and zero otherwise. Other independent variables are lagged and defined in the Appendix. All models use OLS with standard errors clustered at the (incorporation state x year) level. All other variables are defined in Appendix A. All dollar values are inflation adjusted to 2001 using the Consumer Price Index (CPI). *, **, and *** represent statistical significance at the 10%, 5%, and 1% level, respectively.

Panel A: Summary statistics – IPO activity at the state-year level

	Mean	Std	Q1	Median	Q3
COW	0.084	0.278	0	0	0
IPO activity					
IPO volume	0.398	0.687	0	0	0.753
VC-backed IPO volume	0.095	0.304	0	0	0
State level characteristics					
State GDP growth	0.030	0.084	0.002	0.016	0.030
State population	1.599	0.743	0.987	1.625	2.037
State employment	1.237	0.630	0.642	1.196	1.615
Stock return	0.173	0.425	-0.019	0.110	0.251
Market-to-book ratio	2.954	1.370	1.900	2.649	3.697

Panel B: Main regressions

	Dependent variable							
	IPO volume				VC-backed IPO volume			
	Model 1		Model 2		Model 3		Model 4	
	Coefficient	*p*-value	Coefficient	*p*-value	Coefficient	*p*-value	Coefficient	*p*-value
COW	-0.081	0.357	-0.042	0.711	-0.095	0.616	-0.040	0.834
State-level characteristics								
GDP growth			0.023**	0.045			0.348*	0.057
Population			-0.979	0.316			-0.269	0.871
Employment			-1.093	0.315			-2.321	0.205
Stock return			0.001***	0.000			0.001***	0.000
Market-to-book			0.060**	0.010			0.097***	0.001
State FEs	Yes		Yes		Yes		Yes	
Year FEs	Yes		Yes		Yes		Yes	
N	1,173		1,173		1,173		1,173	
Adjusted R^2	0.299		0.322		0.326		0.340	
Reg's *p*-value	0.000		0.000		0.000		0.000	

Table B.2: Regression analyses of joint venture and strategic alliance initiations

The sample consists of 81,134 firm-years for 9,752 unique U.S. firms excluding financials (SIC 4900-4999), utilities (SIC 6000-6999), and public administration firms (SIC 9000-9999) in the merged CRSP-COMPUSTAT database with complete data to analyze joint venture and strategic alliance decisions from 1996 to 2018 as described in Table 6. COW is one if the firm is incorporated in a state which has passed a Corporate Opportunity Waivers law by the fiscal year end date, and zero otherwise. The dependent variable is one if the firm starts a joint-venture or strategic alliance in a given year and zero otherwise. The coefficient for this variable is the difference-in-differences estimate. All coefficients are estimated by OLS due to the use of high dimensional fixed effects. Industry fixed effects use 3-digit SIC and state fixed effects are based on headquarters location. Robust standard errors are clustered at the state of incorporation level. All other variables are defined in Appendix A. *, **, and *** represent statistical significance at the 10%, 5%, and 1% level, respectively.

Dependent variable =	Joint-venture or strategic alliance deal (0,1)			
	Model 1		Model 2	
	Coefficient	*p*-value	Coefficient	*p*-value
COW	-0.010**	0.033	-0.013***	0.005
Firm characteristics				
Size			0.015***	0.000
Leverage			0.006	0.338
Tobin's *q*			-0.000	0.552
Liquidity			0.000***	0.150
ROA			-0.061**	0.001
State × year FEs	Yes		Yes	
Industry × year FEs	Yes		Yes	
N	81,134		81,134	
Adjusted R^2	0.228		0.220	
Regression's *p*-value	0.033		0.000	

Table B.3: Dynamic coefficient trends – Falsification tests

This table presents the dynamic coefficient trends of the effect of COW law on the market's valuation of innovation in Panel A, inventor mobility in Panel B, innovation productivity in Panel C, marginal value of cash in Panel D, acquisition decisions in Panel E, and acquisition quality in Panel F. COW is one if the acquirer is incorporated in a state which has passed a Corporate Opportunity Waivers law by the fiscal year end date, and zero otherwise. COW $^{(y-(+)i)}$ is a dummy equal to one if the fiscal year end of the observation is the i^{th} year before (after) the date the COW law is passed and zero otherwise (y $^{3+}$ denotes year +3 and beyond). Industry fixed effects use 3-digit SIC and state fixed effects are based on headquarters location. Robust standard errors are clustered at the state of incorporation level. All variables are defined in Appendix A. *, **, and *** represent statistical significance at the 10%, 5%, and 1% level, respectively.

Panel A: Market's valuation of innovation

	Dependent variable: *ln*(Tobin's *q*)					
Innovation measure =	R&D spending Model 1		Value of patents Model 2		Number of patents Model 3	
	Coefficient	*p*-value	Coefficient	*p*-value	Coefficient	*p*-value
Innovation	0.569**	0.016	0.305***	0.000	0.454***	0.000
COW $^{(y-2)}$	-0.013	0.374	-0.023	0.116	-0.012	0.361
COW $^{(y-1)}$	0.008	0.210	0.010	0.140	0.010	0.307
COW $^{(y+0)}$	-0.012	0.501	0.012	0.488	-0.001	0.938
COW $^{(y+1)}$	0.004	0.854	0.006	0.788	0.002	0.927
COW $^{(y+2)}$	-0.007	0.400	-0.006	0.300	-0.006	0.784
COW $^{(y\,3+)}$	-0.069***	0.004	-0.067***	0.003	-0.065***	0.004
COW $^{(y-2)}$ × Innovation	-0.009	0.440	0.001	0.689	0.010	0.580
COW $^{(y-1)}$ × Innovation	-0.019	0.231	0.001	0.793	0.040	0.535
COW $^{(y+0)}$ × Innovation	-0.105***	0.000	-0.051***	0.003	-0.252***	0.000
COW $^{(y+1)}$ × Innovation	-0.142***	0.009	-0.057***	0.003	-0.243***	0.000
COW $^{(y+2)}$ × Innovation	-0.149***	0.006	-0.056***	0.006	-0.238**	0.025
COW $^{(y\,3+)}$ × Innovation	-0.176***	0.000	-0.063***	0.002	-0.265**	0.000
Controls and FEs as in Table 2	Panel B Model 1		Panel B Model 3		Panel B Model 5	
N	76,558		76,558		76,558	
Adjusted R^2	0.591		0.600		0.590	
Regression's *p*-value	0.000		0.000		0.000	

Panel B: Inventor mobility

Dependent variable =	Move (0,1)		Move to a start-up (0,1)		Superstar move (0,1)		Superstar move to a start-up (0,1)	
	Model 1		Model 2		Model 3		Model 4	
	Coefficient	*p*-value	Coefficient	*p*-value	Coefficient	*p*-value	Coefficient	*p*-value
COW $^{(y-2)}$	0.003	0.540	0.000	0.443	0.003	0.332	-0.001	0.192
COW $^{(y-1)}$	0.007	0.172	0.000	0.231	0.000	0.925	0.000	0.619
COW $^{(y+0)}$	0.004*	0.052	0.001***	0.006	-0.002	0.483	0.001*	0.075
COW $^{(y+1)}$	0.006**	0.032	0.003***	0.000	-0.001	0.794	0.001**	0.016
COW $^{(y+2)}$	0.008***	0.022	0.003***	0.000	0.002	0.543	0.001***	0.007
COW $^{(y\,3+)}$	0.019***	0.003	0.005***	0.000	0.005	0.104	0.002***	0.000
Controls and FEs as in Table 3 Panel B	Model 1		Model 2		Model 3		Model 4	
N	6,092,123		6,092,123		6,092,123		6,092,123	
Adjusted R^2	0.238		0.181		0.137		0.141	
Reg's *p*-value	0.000		0.000		0.000		0.000	

Panel C: Productivity of inventors who remain with employers that suffer an inventor departure

Dependent variable =	Number of patents		Number of citations		Generality		Originality	
	Model 1		Model 2		Model 3		Model 4	
	Coefficient	*p*-value	Coefficient	*p*-value	Coefficient	*p*-value	Coefficient	*p*-value
COW $^{(y-2)}$	0.001	0.780	0.000	0.234	-0.002	0.157	-0.002	0.291
COW $^{(y-1)}$	-0.005	0.240	-0.000	0.425	-0.002	0.195	-0.002	0.178
COW $^{(y+0)}$	-0.016***	0.000	-0.003***	0.021	0.000	0.947	0.003	0.130
COW $^{(y+1)}$	-0.017***	0.000	-0.007***	0.004	0.002	0.135	0.003	0.124
COW $^{(y+2)}$	-0.018***	0.000	-0.011***	0.000	-0.002	0.167	-0.002	0.121
COW $^{(y\,3+)}$	-0.025***	0.000	-0.020***	0.000	-0.001	0.516	0.002	0.171
Controls and FEs as in Table 3 Panel B	Model 1		Model 2		Model 3		Model 4	
N	3,471,287		3,471,287		3,471,287		3,471,287	
Adjusted R^2	0.260		0.319		0.189		0.190	
Reg's *p*-value	0.000		0.000		0.000		0.000	

Panel D: Market value of cash holdings				
Dependent variable =	Size and M/B adjusted annual excess stock return Model 1		Industry adjusted annual excess stock return Model 2	
	Coefficient	p-value	Coefficient	p-value
Δ Cash	1.524***	0.000	1.627***	0.000
COW $^{(y-2)}$	0.003	0.433	0.021	0.521
COW $^{(y-1)}$	0.008	0.277	0.026	0.475
COW $^{(y+0)}$	0.002	0.835	0.026	0.429
COW $^{(y+1)}$	0.005	0.343	0.023	0.643
COW $^{(y+2)}$	0.004	0.473	0.025	0.553
COW $^{(y\,3+)}$	0.004	0.456	0.029	0.356
COW $^{(y-2)}$ × Δ Cash	-0.007	0.775	-0.007	0.886
COW $^{(y-1)}$ × Δ Cash	-0.025	0.299	-0.008	0.633
COW $^{(y+0)}$ × Δ Cash	-0.090***	0.000	-0.152***	0.000
COW $^{(y+1)}$ × Δ Cash	-0.105***	0.000	-0.178***	0.000
COW $^{(y+2)}$ × Δ Cash	-0.073***	0.001	-0.131**	0.034
COW $^{(y\,3+)}$ × Δ Cash	-0.096***	0.006	-0.121**	0.045
Controls and FEs as in Table 4	Panel B Model 2		Panel B Model 4	
N	48,764		48,764	
Adjusted R^2	0.275		0.287	
Regression's p-value	0.000		0.000	

Panel E: Acquisition decisions						
Dependent variable =	Bid (0,1) Model 1		*ln*(1 + number of bids) Model 2		*ln*(1 + bid value) Model 3	
	Coefficient	p-value	Coefficient	p-value	Coefficient	p-value
COW $^{(y-2)}$	0.002	0.326	0.001	0.363	0.010	0.599
COW $^{(y-1)}$	0.005	0.210	0.001	0.302	0.021	0.204
COW $^{(y+0)}$	0.011***	0.005	0.007***	0.004	0.043**	0.040
COW $^{(y+1)}$	0.008**	0.026	0.006***	0.003	0.041**	0.016
COW $^{(y+2)}$	0.007**	0.030	0.005***	0.007	0.049***	0.001
COW $^{(y\,3+)}$	0.008**	0.017	0.006***	0.005	0.046**	0.020
Controls and FEs as in Table 5	Panel B Model 1		Panel B Model 3		Panel B Model 5	
N	81,134		81,134		81,134	
Adjusted R^2	0.079		0.053		0.057	
Regression's p-value	0.003		0.001		0.001	

Panel F: Acquisition quality						
Dependent variable =	CAR(-1,+1) %		1 if CAR(-1,+1) < 0, 0 otherwise		1 for withdrawn deals, 0 otherwise	
	Model 1		Model 2		Model 3	
	Coefficient	*p*-value	Coefficient	*p*-value	Coefficient	*p*-value
COW $^{(y-2)}$	0.161	0.639	-0.009	0.921	0.004	0.824
COW $^{(y-1)}$	0.204	0.737	0.008	0.593	0.006	0.529
COW $^{(y+0)}$	-0.691**	0.029	0.029**	0.040	-0.028	0.365
COW $^{(y+1)}$	-0.848***	0.009	0.031**	0.035	-0.032	0.311
COW $^{(y+2)}$	-0.689**	0.021	0.037**	0.020	-0.029	0.394
COW $^{(y\,3+)}$	-0.690**	0.035	0.034**	0.036	-0.010	0.342
CAR(-1,+1)					-0.078**	0.036
COW $^{(y-2)}$ × CAR(-1,+1)					0.020	0.784
COW $^{(y-1)}$ × CAR(-1,+1)					-0.048	0.598
COW $^{(y+0)}$ × CAR(-1,+1)					0.118**	0.011
COW $^{(y+1)}$ × CAR(-1,+1)					0.144***	0.001
COW $^{(y+2)}$ × CAR(-1,+1)					0.134***	0.003
COW $^{(y\,3+)}$ × CAR(-1,+1)					0.107**	0.020
Controls and FEs as in Table 6	Panel B Model 1		Panel B Model 2		Panel B Model 3	
N	4,716		4,716		5,082	
Adjusted R^2	0.024		0.035		0.335	
Regression's *p*-value	0.000		0.000		0.000	