Employment Protection and VC Investment: The Impact of Wrongful Discharge Laws

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Abstract

Wrongful discharge laws (WDLs) impair operating flexibility and increase expected financial distress costs by making it costly to fire employees. This impairment is especially detrimental to start-ups, leading to a decline in venture capital (VC) investment. Using a difference-in-differences framework enabled by the staggered adoption of WDLs across the U.S. states, we show VC investment falls substantially after a state adopts the good faith exception and the implied contract exception to the employment-at-will doctrine.

Keywords: Wrongful discharge laws; venture capital; difference-in-differences

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1. Introduction

Venture capital (VC) has been a vital driving force behind growth of innovative companies and the rise of new business sectors. Venture capital facilitates investment in innovative activities by channeling capital to opaque, risky start-up firms (Hall, 2002), and provides them with value-added services such as monitoring and advising (Barry et al., 1990; Sahlman, 1990; Ueda, 2004; Chemmanur, Krishnan and Nandy, 2011). Policymakers attempt to create infrastructure for venture capital through initiatives such as the Small Business Investment Company program in the U.S., in part driven by its perceived impact on innovation and economic growth.

In this paper we investigate the impact of the what-is-called Wrongful Discharge Laws (WDLs) on VC investment in the U.S. Starting in 1959, a majority of U.S. states, in a staggered manner, adopted exceptions to the "at-will employment" doctrine. These exceptions restrict firms' ability to fire employees by widening the scope for lawsuits if the involved employees view the discharge as unfair. In a non-venture setting, Serfling (2016) argues that WDLs limit firms' operating flexibility. By making labor costs less variable, these laws increase operating leverage and in turn increase expected financial distress costs.

Serfling's concerns are heightened in a venture capital setting, where high uncertainty and high financial distress costs make operating flexibility even more important. We hypothesize that WDLs dampen VC activity. Entrepreneurs might be reluctant to create firms (and VCs may avoid funding firms) when the legal environment causes poor operating flexibility. Indeed, VCs often negotiate the right to fire employees as a precondition of financing. In this way, WDLs can affect VC activity both through the demand side (entrepreneurs) as well as the supply side (VCs).

The staggered adoption of WDLs confers us two benefits for our empirical examination. First, WDLs were primarily motivated by labor relations considerations, e.g., the decline of unions and the balance of rights between firms and workers (Walsh and Schwarz, 1996). This makes the regulation shift plausibly exogenous in a VC setting, because the laws changes did not have VC markets as a focal point. Our hazard model analysis also confirms that VC investment does not lead to adoption of WDLs. Second, the staggered nature of WDL adoption across states enables us to employ the difference-in-differences (DD) approach to identify the effect of WDLs on VC investment, in a similar spirit as Acharya et al. (2014) and Serflings (2016) do on, respectively, corporate innovation and capital structure.

The literature categorizes WDLs into three different types; these are described in more detail in Section 2.1. Listed in order of perceived legal strength (i.e., from most binding on the employer to least binding) these types are i) the "good faith exception", ii) the "implied contract exception", and iii) the "public policy exception" (Dertouzos and Karoly, 1992; Krugler and Saint-Paul, 2004; Autor, Kerr and Kugler, 2007).

As expected, we find that WDLs decrease VC investment at the state level. In particular, the good faith exception exhibits a strong negative effect on VC activity. During the 1970-2003 sample period, states that adopted the good faith exception observed a relative decline of approximately one third in dollar amount of VC investment compared to states that didn't. This effect is robust regardless of the selection of sample and sample period. The implied contract exception also negatively impacts VC investment, with an estimated relative decline of 18 percent in amount of investment. The weakest WDLs exception (public policy) has an insignificant effect on VC investment.

Establishing a causal relation between WDLs and VC investment entails careful scrutiny. First, prior studies (e.g., Acharya, Baghai and Subramanian, 2014; Serfling, 2016) have detailed discussion of WDLs as exogenous events to specific corporate policies. A similar argument holds here that WDLs are motivated by equality considerations (labor protection) rather than efficiency considerations (entrepreneurship and economic growth). Second, our examination of the timing of VC investment indicates VC investment declines *after*, but *not before*, the adoption of good faith or implied contract exceptions. Third, analysis based on the Cox proportional hazard model also show that the causality does not go from VC investment to WDL adoption. Fourth, when we randomize the adoption of WDL exceptions across states and over time, no significant effect is found between WDLs and VC investment. Such a falsification test provides a counterfactual to show that the negative relationship is not random. In addition, we show that VC investment in WDL-adopting states and control states follow parallel trends until the adoption of WDLs and depart afterwards, further justifying the difference-in-differences analysis.

Corroborating our findings at the state level, we look into VC investment across various sectors[1] in the U.S. states. The results are qualitatively identical: the good faith exception exerts a pronounced negative effect on VC investment, the implied contract has a weaker yet still significant, negative effect, and the public policy does not have an unambiguous effect. The good faith effect exposes itself immediately after the adoption of the exception, while the implied contract effect is delayed by one or two years.

Our results provide a useful contrast with Acharya et. al (2014) who examine WDLs in a non-VC setting. They show an increase in the number of new business establishments following WDL passage. Their study employs US census data which covers qualitatively different type of businesses than those in our study. Because labor is an important input in the theory of the firm, it is natural to expect that WDLs have a suite of industrial organization effects, including on the optimal firm size and the total number of firms. Together these two studies imply that even when more firms are created after WDLs, they are not the type of firms suitable for VCs investment. Using the same census data, we do show that WDLs lead to a decline in fraction of new firms that receive VC investment.

Acharya et. al (2014) also show that patents increase following WDL passage. Because the two studies dependent variables (patents and VC activity) have both been employed in the literature as proxies for innovation, the two studies again provide an interesting contrast. Yet the term innovation encompasses different types of advances which tend to be pursued by different types of firms. In a survey paper on innovation, Aghion, Akcit and Howitt (2014) conclude that "incumbents focus on improving existing technologies whereas small new entrants focus on innovating with new radical products or technologies". Synthesizing Acharya et al results with ours, we conclude that WDLs seem to encourage the former types of innovative activities while discouraging the latter.[2]

Our work also contributes to the understanding of what shapes the variability of VC investment. Gompers and Lerner (1998) show capital gains taxes have a strong effect on venture capital

[1] Following Bozkaya and Kerr (2014), we use the European Private Equity and Venture Capital Association (EVCA) sector classification, of which the details are in Section X.X. There are no similar sector classification in the U.S. for venture capital sectors.

[2] In addition, it is possible that WDLs cause employees to focus on observable metrics of their performance in the event they need evidence in court. This incentive shift could change patenting behavior, leading to more patents filed.

supplies. Black and Gilson (1998) reveal the importance of well-developed stock markets and initial public offerings (IPOs) for venture capital financing. Jeng and Wells (2000) confirm that IPOs is one of the most prominent drivers of VC investment in a cross-country study. They also show that average tenure on the workers – considered a proxy for labor market rigidities – is negatively associated with early stage VC activity. Gompers et al. (2008) show that more experienced venture capitalists respond to favorable public market signals earlier and view this as evidence that investment opportunities drive venture capital investment. Cumming, Schmidt and Waltz (2010) highlight the role of legal origins and accounting standards in explaining cross-country variations in VC development.

Like us, Bozkaya and Kerr (2014) examine labor market regulations and VC investment. Unlike us, they use European data spanning several countries. Their premise is that employment protection regulations act as a substitute for unemployment insurance. They document a negative (positive) association between the strength of employment protection (unemployment insurance) and VC investment. Compared to Bozkaya and Kerr (2014), notwithstanding, our use of the U.S cross-state data confers several advantages. First, VC activities are much more robust in the U.S. than in Europe, potentially providing a larger sample for understanding of the relation between employment protection and VC investment. Second, differences in legal system across European countries[3] in the Bozkaya and Kerr (2014) sample could have confounding effects on VC investment, which is difficult to tare out; all U.S. states abide by the same set of federal laws, enabling us to largely circumvent this problem. More importantly, the staggered adoption of WDLs by states constitute exogenous shocks to VC investment (which is admittedly lacking in Bozkaya and Kerr (2014)), facilitating difference-in-differences analysis for proper identification of a causal relationship.

Turning to our policy implications, labor market policies sometimes involve a tradeoff between efficiency and equality. Employment protection laws such as WDLs effectively tax employers in the form of increased labor costs, which is especially detrimental to start-ups that are already burdened by the liabilities of newness, smallness and novelty. This is bad news to governments

[3] The law and finance literature (e.g., La Porta et al., 1998) categorize four legal families in Europe: English, French, German, and Scandinavian. The English law, also known as common law, is law developed by judges through decisions of courts; the French, German and Scandinavian laws all fall in the category of civil law, which features codified statues. The U.S. law is common law.

around the world that often resort to subsidies and public venturing to promote entrepreneurship (e.g., Leleux and Surlemont, 2003; Brander, Du and Hellmann, 2015). Externalizing labor protection to provide better unemployment insurance seems to be a potential remedy.

The rest of the paper is organized as below. Section 2 provides the background of WDLs. Section 3 describes data and methodology. Section 4 presents the main results at the state level. Section 5 extends the investigation to the state and sector level. Section 6 concludes.

2. Wrongful Discharge Laws (WDLs)

2.1 Adoption of WDLs

The "at-will employment" doctrine used to define the labor market in the U.S., which grants employers unencumbered ability to dismiss workers in response to changes in their operating environments. The harshness and arbitrary nature of at-will employment, however, had been of target of increasing criticism (e.g., Blades, 1967). Starting from 1959, various state judiciaries enacted a number of "exceptions" that provided employees the weapon to challenge dismissal decisions in court with if they view the dismissal as wrongful, i.e., without a "just cause". This process accelerated in 1980s, a period that featured a dwindled fraction of workers being protected by collective bargaining agreements, i.e., unions, and a recessive economy that caused high unemployment rates unseen in decades. These exceptions, often known as wrongful discharge laws collectively, largely fall into three baskets: good faith, implied contract, and public policy.

The good faith exception is rooted in the tenet that neither the employer nor the employee should be allowed to take unfair actions that terminate the employment. Specifically, courts require employers to establish that dismissal decisions are in "good faith". The interpretation of "good faith" varies from case to case, and may span a good variety of situations in which employees can sue. For example, the employer is expected to have followed a reasonable rule for the dismissal that had been applied evenly to all employees, conducted a timely, thorough, and fair investigation of the employee's conduct, and given the employee advanced notice, and so on.

The implied contract exception states that the employment cannot be terminated by the employer without a good cause in the presence of implicit, enforceable promises of job security. In other words, even if no express representation exists in a written contract, the employee can cite employee handbooks, oral statements made by supervisors or interviewers, the history of the employer's practices with respect to retaining employees, and the like, to challenge the dismissal decisions of the employer.

The public policy exception offers an employee the cause of action against the employer's dismissal decision when the dismissal would contravene some well established public policy. For example, the employee should not be terminated for reporting the employer's wrongdoing, or refusing to commit an illegal act. The principle behind this exception is that the public good outweighs private interests of an organization, and an employee should not be penalized for acting in a way to promote the public good.

The implied contract exception is the most widely accepted, followed by the public policy exception. As of the turn of the century, 46 states (other than Florida, Georgia, Louisiana and Rhode Island) had adopted the implied contract exception, 43 states had enacted the public policy exception, but only 14 states had established the good faith exception.[4] Figure 1 shows the staggered adoption of these WDLs. As is evident in the figure, 1980s witnessed a rapid increase in the adoption of the implied contract and public policy exceptions, and the adoption of the good faith exception was slower and extended well into 1990s.

2.2 Impacts of WDLs

WDLs curtail the at-will employment doctrine and restrict employers' flexibility in firing workers. As a result, they effectively impose additional labor costs on employers. Direct costs include, and are not limited to, damage awards to discharged employees who sue. According to Newsweek, in trials of wrongful discharge cases, verdicts run heavily in favor of employees as sympathetic jurors often perceive big business as the bully (Copland, 1987). "Employees won 72 percent of the libel and other job-termination trials" in the seven-year period of 1980-1986 in California, and were awarded $582,000 on average, and companies also have to spend from $50,000 to $250,000 to defend these cases. (Copland, 1987). Dertouzos, Holland and Eberner (1988) report that of the

[4] The identification of passage of WDLs follows Serflings (2016) (pp. 2247.)

120 wrongful discharge cases in California, plaintiffs won in 68 percent of the trials with an average award of $650,000, or about 18 years' of salary. Similar large-amount awards are found true also in other states (e.g., McGuinnes, 1988; Jung, 1997; Abraham, 1998).

Companies respond on two fronts to minimize the monetary and reputational costs of WDL-enabled litigations. On the one hand, they take costly measures such as severance pay, extended benefits and outplacement assistance in the process of layoffs (e.g., Feldman and Leana, 1989). On the other hand, they purchase Employment Practices Liability Insurance (EPLI), which gained popularity in 1990s following the increase in wrongful discharge claims, to offset losses from these claims (e.g., Klenk, 1999; Davis and Gassman, 2013; Meyers and Hersch, 2021).[5] Overall, WDLs are found to lead to increased labor costs (Bird and Knopf, 2009).

Real effects of WDLs are also documented both at the economy level and at the firm level. For instance, Dertouzos and Karoly (1992) and Autor, Donohue and Schwab (2004, 2006) document a decline, albeit of different degrees, in overall employment in states that adopt WDLs; in contrast, Miles (2000) finds no difference in employment across states with and without WDLs, and MacLeod and Nakavachara (2007) show WDLs lead to increased employment. Thus WDLs' effect on employment is ambiguous. Similarly inconclusive is their effect on firm creation. Using establishment-level Annual Survey of Manufacturers (ASM) data from the Census Bureau, Autor, Kerr and Kugler (2007) show slower employment flows and firm entry rates, as well as an overall decline in total factor productivity associated with WDLs. Also using establishment-level data from the Census Bureau yet of the Business Dynamics Statistics (BDS) database, Acharya et al. (2014) find the WDLs spur innovation as measured by public firms' patents as well as new firm creation. Consistent with the increased labor costs, Serflings (2016) find that firms' operating leverage and earnings variability increase after the adoption of WDLs, and they respond by reducing debt ratios.

Out of the three WDLs, the good faith exception is often viewed as the most impactful because it offers the employees the greatest liberty to challenge the dismissal legally and is also associated with potentially largest rewards (Dertouzos and Karoly, 1992; Kugler and Saint-Paul, 2004; Serflings, 2016). Miles (2000) and Autor, Kerr, and Kugler (2007) suggest that firms can to some

[5] "Prior to 1990, insurers offered EPLI on a limited basis. With the increase in claims involving wrongful employment practices, the number of insurers offering an EPLI product ballooned." (Davis and Gassman, 2013)

extent circumvent the liabilities of implied contract by including disclaimers in their employees' handbooks stating that employment contracts are at-will. Usually defined to include only statutes, the public policy exception is the least binding to employers (Kugler and Saint-Paul, 2004). Consistent with the above arguments, Acharya et al. (2014) and Serflings (2016) both find only the good faith exception impacts firm policies significantly; Miles (2000) and Bird and Knopf (2009) find the implied contract exception appears to be responsible for the increase in temporary employment and in labor expenses, respectively.

2.3 Impact of WDLs on VC investment

An increase in labor costs would burden all companies, but especially inflict start-ups. Being new, small and often innovative, start-ups are the most sensitive to changes in the operating environment (e.g., Stinchcombe, 1965; Baum and Oliver, 1996; Berger and Udell, 2006; Hyytinen, Pajarinen and Rouvinen, 2015), and hence most vulnerable to the WDLs. As a result, VC funds have to select from a smaller pool of startups with lower survival rate after the adoption of WDLs. Additionally, WDLs compromise VC funds' ability to close underperforming ventures and reallocate resources toward more promising investments, and weaken the VC business model (e.g., Kaplan and Stromberg, 2003; Kovner and Lerner, 2009; Da Rin et al., 2012; Bozkaya and Kerr, 2014). As such, we expect VC investment would decline in states that adopt WDLs relative to those that do not.

There are no prior studies that investigate the specific question of how WDLs affect VC investment. Yet a few papers examine topics that are within a short diameter. First of all, Bozkaya and Kerr (2014) view employment protection laws and labor market expenditures, i.e., unemployment insurance, as two substitute mechanisms European countries shield labor interests with, yet they have different implications on VC investment. Countries with more labor market expenditures (and less employment protection) developed stronger VC markets. They hold that this result is because employment protection increases labor costs, which VC investors are most sensitive to, while labor market expenditures effectively lower labor costs of start-ups.[6]

Bozkaya and Kerr (2014) is the first ever to document a potential relation between employment protection and VC investment. Yet their study is subject to a few drawbacks. As they acknowledge,

[6] To certain extent labor market expenditures are public good that indirectly channel funds from profitable, established firms to start-up firms.

they were not able to establish the causality because of the lack of exogenous shocks. Their results are sensitive to the inclusion of Anglo-Saxon countries (UK and Ireland), which might underscore the importance of legal origins. Compared to theirs, our study benefits from the availability of staggered adoption of WDLs serving as exogenous shocks to employment protection, which enables us to make causality inferences. Using the state-level data in the U.S. also confers the advantage of a uniform legal origin that circumvents potential confounding effects of differences in legal system. Moreover, the U.S. boasts of much more active VC activities than Europe, especially continent Europe, and cross-state variations in VC investment in the U.S. are also greater than cross-country variations in continent Europe, providing us a larger sample with more variable observations.[7]

Acharya et al. (2014) link the WDLs to innovation at the firm level. They hold that WDLs limit employers' ability to hold up innovating employees, and thereby enhance employees' innovative efforts and encourage firms to invest more in innovative activities. Consistent with this hypothesis, they find that total number of patents and patents per employee both increase for U.S. firms located in states with WDLs compared to those without.

A main difference between our work and Acharya et al. (2014) is that our dependent variable is VC investment (vs. patents). Considering patents are mainly produced by established firms and startups are not major contributors (Cao and Hsu, 2011; Hall, 2019)[8], WDLs' negative impact on VC investment does not necessarily contradict with their positive effect on patents. Rather, the contrast accentuates the differences between start-ups and established firms: the former endeavor to bring about radical advancements yet often struggle to survive, whereas latter often don't worry about survival but tend to work on only incremental improvements (Shumpeter, 1912; Aghion, Akcit and Howitt, 2014)[9]. Thus, for incumbents the benefit of promoting innovation is greater than the increased labor costs of WDLs; for start-ups, in contrast, the labor cost effect outweighs the innovation promotion effect.

[7] Bozkaya and Kerr (2014)'s sample covers 12 continent European countries with VC deals totaling 13,249 during 1990-2008. France has the most deals (3,368) and Portugal the least (320). Our baseline sample covers 44,983 deals in 50 U.S. states during 1970-2003. Across states, the total number of deals varies from 0 (AK) to 17,314 (CA).

[8] Cao and Hsu (2011) examined VC-backed startups in the U.S. during 1976-2005 and find only 8.9 percent have patents. Non-VC-backed startups are even less likely to own patents (Hall, 2019).

[9] Summarizing the prior literature, Aghion, Akcit and Howitt (2014) conclude that ".... large incumbents focus on improving existing technologies whereas small new entrants focus on innovating with new radical products and technologies".

Acharya et al. (2014) argue that great innovative efforts by employees of established firms indirectly cause more new firm creation. They do show that WDLs are associated with an increase in number of new establishments. Juxtaposing this empirical result against ours, we conclude that although WDLs lead to more new firms, these firms are less likely to be the type venture capitalists are interested in.

Hass, Shum and Tarsalewska (2016) also examine the link between the labor costs and VC investment. Their angle is opposite to ours: they argue that better unemployment insurance lowers labor costs and thereby enhances VC investment. This study provides a nice contrast to ours, because the two independent variables affect venture capitalists in different ways. Unemployment insurance acts as a safety net for employees, which may in turn make it easier for employers to fire them. WDLs by design have the opposite effect.

3. Data and Methodology

3.1 Sample selection

Our venture capital data source is the Thompson Reuters VentureXpert database. For every portfolio firm we record its location and primary SIC code, based on which we can assign it to certain state and sector. A same firm may receive multiple rounds of investment, and we treat each round of financing as a VC deal, and record the date and total amount of capital raised in theround. We restrict attention to US-based firms and screen out the following transactions: 1) private investments in public equity (PIPE), leveraged buyouts (LBO), and others classified as "public market" transactions, 2) transactions made by funds of funds, 3) financial, banking, insurance and real estate companies, 4) utilities firms, and 5) companies that are 15 years old or older. We also manually excluded several misclassified buyout and M&A transactions. We transform the dollar amount of a VC deal by the consumer price index to the constant dollar of year 2000, and then aggregate the number, and the dollar amount, of VC deals in each state and year.

Our baseline sample period is 1970-2003. 1970 is the first year when VC deals are covered by VentureXpert. It fits our need excellently also because other than the adoption of the public policy exception in California, adoption of the public policy and implied contract exceptions all occurred during 1972-1992. The passage of good faith exception started in 1974 and ended in 1998. We keep five years after 1998 to observe the effects of the good faith exception. Yet we also employ different sample periods, 1970-2008 and 1980-2003, for robustness check.

During the 1970-2003 period, our sample consists of 44,983 rounds of finance which cover 14,949 distinct firms in 49 states (there are no VC deals in Alaska.) Figure 2 shows that total VC investment exploded significantly during this period, in both the number of deals and the dollar amount. The number of deals is lower than 100 in most of 1970s and reached 5,280 in 1999, and the dollar amount peaked in 2000, the height of the doc.com bubble. Two regulatory events catalyzed the increase of VC investment. First, the U.S. Department of Labor issued a clarification of the Employee Retirement Income Security Act (ERISA) in 1979, opening the door for pensions to invest in venture capital funds (Kortum and Lerner, 2000). Second, the passage of the National Securities Markets Improvement Act (NSMIA) in 1996 exempted private sales of securities from state regulations known as blue-sky laws, making it easier for VC funds not only to raise capital but to exit a portfolio firm (Ewens and Mensa, 2020). In the figure the acceleration of increase is discernible around 1979 and 1996.

3.2. State characteristics

Cross-state differences in unemployment insurance, demographics, economic development, higher education, and political balance might affect VC investment. Mainly following Acharya, Baghai and Subramainan (2014), we compile a set of state characteristics data from various sources. Unemployment insurance is based on the archived "Significant Provisions of State UI Law" files available from the U.S. Department of Labor website, and measured as the maximum benefit possible, i.e., the product of the maximum weekly benefit and the maximum duration allowed (Agrawal and Matsa, 2012). Population, real gross domestic product (GDP), and real GDP growth rate are extracted from the U.S. Bureau of Economic Analysis database. We take the logarithm of both population and real GDP and express the real GDP growth rate as percentages. The development of higher education in a state may contain information about the technological and intellectual potential. We thus collect the number of higher education institutions (Colleges) and

college enrollment in each state and year from the Annual Statistical Abstracts of the U.S. Census Bureau. From the same source we also obtain the numbers of Democratic and Republican, separately, representatives in the House of Representatives in each state and year, and then use the Democrat-to-Republican ratio to measure the political balance. We control for political balance because it has implications on a wide array of economic and business issues such as taxation and entrepreneurship (e.g., Peters, 1991; Beland and Unel, 2019).

We also follow Serflings (2016) to estimate a hazard model to see if the adoption of WDLs can explained by the prior VC investment. In this model, we bring in two additional sets of explanatory variables. The first set are the fractions of states in the same federal circuit region that has adopted the good faith, implied contract, and public policy exceptions, respectively, in a given year. The second set of variables are the Union membership density, measured as the fraction of nonagricultural employees in a state who are union members in a given year, the state unemployment rate, and their changes from the preceding year. These variables are relevant because the decline in unionization and increase in unemployment are among primary motivations of the WDLs (Walsh and Schwarz, 1996). State judges also consider if other states have adopted a similar exception when making their own WDL-related rules (Walsh and Schwarz, 1996; Bird and Smythe, 2008).

For detailed variable definition, please see Table 1.

[Insert Table 1 about here]

3.3 Summary Statistics

Table 2 presents the summary statistics of variables in our baseline sample during 1970-2003. There are 1,700 state-year observations over the 34-year period. A state on average witnesses about 26 VC deals in a given year with a total dollar value of $177 million. VC activities vary vastly across state-years: some state had no VC investment at all in certain years, while the maximum number (value) of VC deals in a state-year is 2,020 ($33 billion). In 15 percent of the state-years, the good faith exception has been adopted, while the implied contract exception is in place in 54 percent of observations, and the public policy exception in 48 percent of observations. Maximum amount of unemployment insurance averages $5,150 and spans a wide range from about $1,000 to over $23,000. Thus, variations abound in both labor market variables and VC investment.

Population and GDP also vary across states. Real state GDP growth rate averages 2.87 percent. Political balance, the ratio of Democrat-to-Republican representatives in the Lower House, ranges from 0 to 11. On average a state houses 68 higher education institutions that enroll 252,800 students.

Circuit WDLs have averages consistent with the Good Faith, Implied Contract and Public Policy indicators in the sample, but with smaller standard deviations. Across all observations, 17.4 percent of workers are unionized, and unemployment rate averages 6 percent. Changes in these two metrics are slightly negative, reflecting the downward trend in unionization and unemployment over the sample period.

[Insert Table 2 About Here]

3.4 Empirical Methodology

The staggered adoption of WDLs enables us to take advantage of conduct difference-in-differences analyses of their impact on VC investment. Prior authors including Autor, Donohue and Schwab (2006), Acharya et al. (2014) and Serflings (2016) all employ a similar strategy, despite different dependent variables. This approach views states that have adopted WDLs as treated observations and those that haven't as the control group, and compare the post- vs. pre-WDL differences across the treatment group and the control group. The difference-in-differences supposedly would reveal the net effect of WDLs on VC investment.

Specifically, we estimate the following panel model:

$$VC_{st} = \beta_1 GF_{st} + \beta_2 IC_{st} + \beta_3 PP_{st} + X_{st} + \gamma_s + \delta_t + \varepsilon_{st} \,, \qquad (1)$$

where VC_{st} is the VC investment in state *s* and year *t*, and GF_{st}, IC_{st} and PP_{st} are dummy variables to indicate whether state *s* has adopted the good faith, implied contract, and public policy exceptions, respectively, as of year *t*. X_{st} are state characteristics brought in as control variables, including unemployment insurance, population, GDP, real GDP growth rate, political balance, number of colleges and college enrollment (Acharya, Baghai and Subramanian, 2014). The model also includes state fixed effects, γ_s, and year fixed effects, δ_t. The state fixed effects control for unobservable heterogeneity across states, and the year fixed effects account for intertemporal technological shocks as well as other economic, regulatory, and legal changes that potentially

impact the whole VC market. Following prior literature, we cluster standard errors at the state level to account for potential serial correlation in the data (e.g., Bertrand and Mullainathan, 2003; Acharya, Baghai and Subramanian, 2014).

In this model, we are most interested in β_1, β_2, and β_3, which tell the effects, if any, of the good faith, implied contract, and public policy exceptions, respectively, on VC investment. Our hypothesis dictates a negative relationship between WDLs and VC investment. As aforementioned, the good faith exception is the most, and the public policy exception the least, impactful. Thus, we expect these three coefficients to be negative, but likely descending in the order of β_1, then β_2, and lastly β_3.

4. Main Results

4.1 Baseline regressions

Table 3 presents the baseline difference-in-differences estimation results. VC investment is measured by the logarithm of number, and dollar amount, of VC deals in a state year. For each dependent variable, we employ two specifications: specification (1) has only labor market variables, namely, the good faith, implied contract and public policy indicators as well as unemployment insurance, as explicit explanatory variables, and specification (2) brings in state characteristics.

The good faith indicator obtains negative and statistically significant coefficients in all the four models, and the magnitude of the coefficients are larger when state characteristics are controlled for. The coefficient is -0.149 in specification (2) when the dependent variable is the logarithm of count of VC deals, indicating that states on average experience a decline of approximately 14

percent in the number of VC deals after adopting the good faith exception[10]. Likewise, the coefficient in the last column is -0.402, representing approximately a 33 percent decline in total dollar amount of VC investment. These numbers are economically large. For an average state year, the number of VC deals falls from 26.5 to 22.8, and the dollar amount drops precipitously from $177.4 million to $118.7 million, after the adoption the good faith exception.

The implied contract has a similar effect on VC invest, albeit to a lesser extent. The coefficients of the indicator are negative and statistically significant regardless of the measure of VC investment and the model specification. When state characteristics are controlled for, the coefficients are -0.107 and -0.193, respectively. which translate to a reduction of approximately 10 percent (18 percent) in the VC count (VC amount) following the adoption of the implied contract exception.

The public policy indicator also obtains negatively in all the four regressions, but three of them are not statistically different from zero. In particular, the coefficients are close to zero when VC amount is the dependent variable and state characteristics are controlled for. Relatively, the public policy exception appears to have some negative impact on the number of VC deals but not on the dollar amount.

In a nutshell, the above results show WDLs negatively impact VC investment, and the effect is the strongest of the good faith exception and the weakest of the public policy exception, consistent with our expectations.

Specification (2) considers state characteristics that might have a bearing on VC investment. First, unemployment insurance has been found to be conducive to VC investment because it effectively makes labor adjustments less costly (Bozkaya and Kerr, 2014; Hass, Shum and Tarsalewska, 2016). In our estimation, Unemployment insurance receives positive coefficients, and the coefficient is statistically significant at the five percent level when the dependent variable is the VC count. This result partially confirms the prior observations in the literature.

[10] Percent change in the dependent variable is computed as $[exp(\beta_1)-1]\times 100$. Some states do not have VC investment in certain years, hence our logarithm transformation is $ln(1+VC\ count)$ instead of $ln(VC\ count)$, which makes our reported percent change an approximate estimate. Similar treatments are applied to VC amount but the approximation might be closer to the true value given the average VC amount for transformation is greater than average VC count.

State GDP and GDP growth rate both receive positive and statistically significant coefficient. Thus, more developed economy and fast growth are associated with more VC investment. Political balance loads negatively, indicating an increase in the Democrat house representatives relative to Republican representatives is bad news to VC investors. The coefficients are negative for both number of colleges and college enrollment, and statistically significant for the former. Acharya et al. (2014) find a similar negative relation between these two variables with corporate innovation.

[Insert Table 3 about here]

4.2 Alternative samples

VC investment was tiny in 1970s. In eight out of 10 years, we record less than 100 VC deals with a total dollar amount below $100 million (in constant dollar of year 2000). More than half (256 out of 500) state-years do not witness any VC deals. VC became a non-trivial player in the capital market only after the ERISA clarification in 1979. To make sure our results are not driven by the 1970s observations, we curtail the 1970s from our sample period and re-run the difference-in-differences tests in the post-ERISA period, i.e., 1980-2003. For brevity, we report only specification (2) estimates of coefficients on the three WDL indicators in the two left columns in Table 4.

The good faith indicator obtains a coefficient of -0.312 in the VC count regression and -0.500 in the VC amount regression, both statistically significant at the one percent level, and larger in magnitude than their counterparts in Table 3. The implied contract indicator receives negative coefficients, one of which is statistically significant. The coefficients on the public policy indicator, however, turn positive with one being marginally significant. Thus the negative effect of the good faith exception is even stronger when we don't consider 1970s, but the implied contract effect becomes weaker.

In a second robustness test, we extend our sample period to 1970-2008, leaving 10 years, instead of five years, after the last adoption of the good faith exception. All the six coefficients on the WDL indicators are negative, and larger in magnitude as well as more statistically significant, than their counterparts in Table 3. This is potentially because the longer-run effect of WDLs are brought under radar with this longer sample period.

There are several states worth further inspection. California and Massachusetts are among the first to enact WDLs but are also well-known as the hotspots of VC investment.[11] Alaska, in contrast, is among the 12 states that have all the three exceptions in place, but has no VC deals at all during our sample period. To address the concerns that these "outliers" may distort our result, we re-run our tests in a sample excluding California and Massachusetts, and in another sample excluding Alaska, and report the estimates on the right-hand side of Table 4. Eyeballing the coefficients show the negative impact of the good faith exception is accentuated when CA and MA are excluded, but weakened a little when AK is excluded; that of implied contract exception is weakened.

The above tests in altered samples confirm our baseline results that WDLs negatively impact VC statement, and the good faith exception, in particular, has the strongest effect.

[Insert Table 4 about here]

4.3 Dynamic effects of WDLs

Following similar practices of Acharya et al. (2014) and Serflings (2016), we examine the timing of VC investment relative to the timing of the adoption of WDLs. This practice helps mitigate the concern of potential reverse causality as well as provide the dynamics of the WDL effect (Bertrand and Mullainathan, 2003). Specifically, for the good faith exception, we construct four timing indicators: *Good Faith*$^{-1}$, *Good Faith*^{0}, *Good Faith*^{1}, and *Good Faith*$^{2+}$, where the superscripts denote the year relative to the adoption of the good faith exception in a given state. Thus, *Good Faith*$^{-1}$ is equal to one if a state will adopt the exception in the following year and zero otherwise. *Good Faith*^{0} is equal to one if a state adopts the exception in the current year; *Good Faith*^{1} and *Good Faith*$^{2+}$ are equal to one if a state adopted the exception one year ago, and two or more years ago, respectively. These four indicators replace the good faith indicator in the baseline model. Likewise, we use four indicators, *Implied Contract*$^{-1}$, *Implied Contract*^{0}, *Implied Contract*^{1}, and *Implied Contract*$^{2+}$, to replace the implied contract indicator. We keep the public policy indicator

[11] California is the first to adopt the public policy exception (in 1959) and the implied contract exception (1972) and the fourth to adopt the good faith exception (1980). Massachusetts is the second to adopt the good faith exception (1977) and also adopted the other two exceptions in 1980s. California and Massachusetts combined have 22,908 VC deals during 1970-2003, accounting for half of all deals in the U.S.

unchanged because it has been found not impactful in previous tests.[12] Then we repeat the tests of Table 3 and report the estimated coefficients of WDL indicator variables in Table 5.

Good Faith^{-1}does not load in three out of four specifications and loads only marginally in the other. In contrast, *Good Faith*^{0} and *Good Faith*$^{2+}$ load negatively in all four specifications, and the statistically significance is strong especially for the latter. This indicates that VC investment does not decline preceding the adoption of the good faith exception, and the decline lasts far into post-good faith years. A similar diagnosis show that VC investment starts to respond to the adoption of implied contract exception a couple of years after the law is passed. Thus, changes in VC investment do not precede the adoption of WDLs.

[Insert Table 5 about here]

4.4 Survival analysis

We have already shown that changes in VC investment do not precede the adoption of WDLs. Walsh and Schwarz (1996) also point out that rationales for states to adopt WDLs are largely orthogonal to an objective to promoting VC investment or economic growth at large. Instead, considerations state courts had focused on fairness in employment relationships and consistency with established principles of contract law. Nevertheless, we conduct a survival analysis of the WDL adoptions to alleviate the residual concern of endogeneity, in a similar vein as Acharya et al. (2014) and Serflings (2016).

In this practice, we employ the Cox proportional hazard model and view the adoption of a WDL, i.e., the good faith exception, the implied contract exception, or the public policy exception, as a failure event. Such a setup allows us to detect which factors are relevant in affecting the "hazard rate" of the WDL adoption. A state remains in the sample until the year it adopts the exception. VC investment, measured by the number and dollar amount of VC deals, separately, is the main independent variable of interest. For each exception, we include the other two exceptions as independent variables to account for the potential correlation among them. Unemployment insurance, which provides substitute labor protection, is included. State population, real GDP and real GDP growth are controlled for. In addition, following Serflings (2016), we bring in two sets of control variables: 1) the fraction of states in the same federal circuit that has adopted a similar

[12] When we replace it with four timing indicators similarly defined, none of the indicators loads in any specification.

exception, and 2) the level and year-over-year change in union membership density and unemployment rate as independent variables. All these independent variables take their lagged values. The sample period is 1970-2003.

Estimation results are reported in Table 6. Notable observations are the following. First of all, neither VC count nor VC amount loads, regardless of the failure event. Thus, the adoption of WDLs is not related to past VC investment, further alleviating the concern of reverse causality. Second, unemployment insurance consistently obtains negative and statistically significant coefficients. This is consistent with the concept that the lack of adequate unemployment protection is a trigger for enhanced employment protection. Third, the passage of good faith exception is not influenced by the adoption of the other two exception, but it increases the likelihood the public policy exception is adopted. This seems to reiterate the preponderance of the good faith exception among the WDLs.

[Insert Table 6 about here]

4.5 Randomized WDL adoption

We have shown changes in VC investment do not precede the adoption of WDLs, nor do they predict the latter. Another question is: can the relation between WDLs and VC investment just happen to be there for no reason? In this section, we randomly select states to adopt the WDL exceptions in randomly picked years during the 1970-2003 period to create 500 counterfactual samples. We run the baseline difference-in-differences tests in these sample and record the estimated coefficients on the good faith, implied contract, and public policy indicators. Table 7 presents the statistic summary of these coefficients.

It is obvious that all these three indicators receive coefficients that have near-zero means and medians, regardless of the measure of VC investment and whether state characteristics are included in the model specification. Reported in the last two columns, the t-test and Wilcoxin signed rank test show the mean and median coefficients are undistinguishable from zero. Therefore, it is very unlikely that the relation between WDLs and VC investment we document in the above is pure serendipity.

[Insert Table 7 about here]

4.6 Parallel trends

A key assumption for consistency of the difference-in-differences estimator is the parallel trends, that is, the response variable follows the same trend for both the treatment and control groups before the treatment (Roberts and Whited, 2013). To verify the parallel trends for VC investment, we broadly follow Acharya et al. (2014) and Serflings (2016) to depict the changes in VC investment around the adoption of the good faith or implied contract exception (we do not consider the public policy exception because it is shown earlier to have no or trivial impact on VC investment.) Specifically, we estimate a model as below:

$$VC_{st} = \sum_{\tau=-10}^{10} \beta_\tau WDL_{st}^{\tau} + \gamma_s + \delta_t + \varepsilon_{st} \ , \qquad (2)$$

where WDL_{st}^{τ} is an indicator variable set to one in a year that is τ years away from the year when state *s* adopts the good faith or implied contract exception, and zero otherwise. Note that each of these indicators would take value of one twice if the state adopts the good faith and implied contract exceptions in different years. So the indicators capture the effect of both the exceptions. Then we plot the point estimates of β_τ, which tells the difference in VC investment between WDL-adopting states and the rest, and their 90 percent confidence interval in Figure 4. [13]

The upper (lower) plot is for the estimates with VC count (VC amount) as the measure of VC investment. In either plot, the horizontal axis denotes the time relative to the year of adoption of the good faith or implied contract exception, ranging from five years prior to adoption to 10 years after; the vertical axis represents the amount of VC investment. There is a discernible kink at time 0: in years before time 0, the plot is largely flat, indicating the WDL-states and the rest follow the same trends in terms of VC investment; in years after time 0, the plot slopes downward, indicating WDL-states have lower VC investment than the rest after adopting the good faith or implied contract exception. In short, Figure 4 verifies the existence of parallel trends before the event and strengthens our finding that WDLs decrease VC investment.

[Insert Figure 4 about here]

4.7 Less VC investment for more new firms?

[13] We employ the post-ERISA period, i.e., 1980-2003, to estimate this model. Inclusion of the 1970s would make the pattern undiscernible, possibly because to the very low level of VC activities in this pre-ERISA period.

Acharya et al. (2014) show that the passage of WDLs, especially the good faith exception, leads to creation of new firms, both theoretically and empirically. Their rationale is that WDLs enhance employees' innovative efforts and lead to more generic innovations, which in turn leads to the increase in creation of new firms. Using the establishment-level Business Dynamic Statistics (BDS) data and a similar difference-in-differences approach, they find a significant positive relation between the adoption of the good faith exception and, among others, the number of establishments created by start-ups. This seems to contradict to our findings that WDLs contain VC investment.

To reconcile the two seemingly conflicting findings, we look into the VC funding rate, namely, the fraction of start-ups that receive VC funding. This variable is first proxied by the number of VC deals in a given year divided by the number of establishments that are created in the preceding 3-year period, assuming that a start-up might receive VC funding in the three years after it is founded. We employ two variations of this measure for robustness. First, we use the 5-year period to general of pool of candidate start-ups; second, we use the number of newly created firms rather than establishments. Data of establishment and firms in all the 50 states are extracted from the BDS database. New establishments (firms) are defined as establishments (firms) with age 0.

In Table 8, we first attempt to replicate the Acharya et al. (2014) result, using the logarithm of number of new establishments in a state as the dependent variable and the three WDL indicators as the main dependent variable. The good faith indicator obtains a coefficient of 0.052, statistically significant at the one percent level. This is consistent with the Acharya et al. (2014) finding that the good faith exception leads to an increase in new firm creation.[14] Then we replace the number of new establishments by the four measures of VC funding rates and re-run the estimates. The good faith indicator obtains negative coefficients that are statistically significant at the five percent level in all the four specifications, indicating that after the adoption of the good faith exception, a smaller fraction of start-ups receives VC funding. This helps explain why more firms are created but less VC deals are made. Likewise, the implied contract indicator loads negatively, implying that this WDL exception also lowers the likelihood of startups receiving VC capital.

[Insert Table 8 about here]

[14] We and Acharya et al. (2014) both obtain a negative coefficient on the implied contract indicator, but ours is statistically significant and theirs not. This may be attributable to the differences in the sample period and model specification.

5. VC Investment at the sector level

5.1 Baseline investigation

It is well known that VC investment concentrates in a few sectors such as computer technology and biotechnology. Easy access to new ideas, talents and capital makes some locations hotspots of VC-backed start-ups of certain particular business sectors. For instance, computer-related start-ups flock in the silicon valley in California, while the Boston area is the birthplace of many biotech companies. This raises a question: do WDLs adopted by states influence VC investment at the sector level?

To answer this question, we modify model (1), as below, to accommodate difference-in-differences analyses at the state and sector level.

$$VC_{ist} = \beta_1 GF_{st} + \beta_2 IC_{st} + \beta_3 PP_{st} + X_{st} + \gamma_s + \delta_{it} + \varepsilon_{ist} \,, \tag{1}$$

where subscript *i* denote the *i*-th business sector. VC_{ist} then is the VC investment in sector *i*, state *s*, and year *t*. The good faith (GF_{st}), implied contract (IC_{st}) and public policy (PP_{st}) indicators remain unchanged, and so do state characteristics ($\boldsymbol{X_{st}}$) and state fixed effects (γ_s). δ_{it} represents sector-year fixed effects, and ε_{ist} the error. Again, the coefficients of main interest are $\beta_1, \beta_2,$ and β_3.

We use the European Private Equity and Venture Capital Association (EVCA) standard to classify VC-backed firms into 15 business sectors (Bozkaya and Kerr, 2014).[15] Dividing the sample by state and sector aggravates the dearth of VC activities in 1970s. Table 9, Panel A display the distribution of sector-level VC count in different subperiods. In 1970s, the 90th percentile is zero, the 95th percentile is one, and the 99th percentile is 2. In other words, over 90 percent of the state-sectors in 1970s witnesses no VC deals. In 1980s and 1990-2003, the median number of VC deals is still zero, but the 90th percentile is 3 and 5, respectively, and the 99th percentile is 18 and 54, respectively. To avoid the excessive clustering on zero and the lack of variation, we exclude 1970s from our sample. We are left with 18,000 observations at the state-sector level.

[15] For EVCA sector definition please see Bozkaya and Kerr (2014). We combine Industrial Products and Services and Industrial Automation sectors into the Industrials sector to minimize classification errors. Our sample does not include Financial Services companies. There exists no similar sector classification specifically for venture capital investment in the U.S. Yet when we use the Fama-French 17 industry classification to define sectors, results are qualitatively similar.

Table 9, Panel B, reports the difference-in-differences estimation results. The good faith and implied contract indicators both load negatively with coefficients statistically significant at the one percent level; the magnitude of the coefficients on the good faith indicator is greater than those on the implied contract indicator. The public policy indicator receives coefficients that are undistinguishable from zero. These results are consistent with those found at the state level: WDLs in aggregate negatively impact VC investment; among the three WDLs, the good faith exception is the most impactful, and the public policy is the least.

The coefficients on state characteristics are largely consistent with those at the state level. In particular, unemployment insurance loads positively, reinforcing the idea that governments' labor market expenditures effectively lower labor adjustment costs, which in turn makes start-ups more appealing to venture capital.

[Insert Table 9 about here]

5.2 Dynamic effects of WDLs

In this section we repeat the state-level practice to examine the relative timing of WDL adoption and changes in VC investment, in a view to alleviate the reverse causality concern. In short, we use a set of timing indicator variables, $Good\ Faith^{-1}$, $Good\ Faith^{0}$, $Good\ Faith^{1}$, and $Good\ Faith^{2+}$, to replace the good faith indicator in the difference-in-differences regressions, and do the same for the implied contract indicator. For detailed definition of these timing indicator variables, please see Section 4.3. Table 10 reports the estimation results.

The coefficients on $Good\ Faith^{-1is}$ essentially zero, while those on $Good\ Faith^{0}$, $Good\ Faith^{1}$, and $Good\ Faith^{2+}$ load negatively, regardless of the measure of VC investment and model specification. This show that at the sector level, VC investment declines as and after, but not before, the good faith exception is adopted. All the four timing indicators about the implied contract exception receive negative coefficients, but only the one on $Implied\ Contract^{2+}$ is statistically significant. Thus, VC investment declines two or more years after the adoption of the implied contract exception.

[Insert Table 10 about here]

6. Conclusion

In the past few decades, VC investment has become an important engine of growth by funding innovative start-ups, helping create many of largest companies such as Amazon and Alphabet. These VC-backed firms, subject to the liabilities of smallness, newness and novelty, have very high chances of failure, and are more susceptible, compared to established firms, to any negative shocks in their operating environment. As such, a core feature of the VC business model is value of options embedded in the flexibility to terminate failing ventures and reallocate resources to promising ones.

Over the same time period, labor relations have experienced profound changes in the U.S., characterized by the declining unionization and weakening bargaining power of unions, which led to lower wages for the middle class and greater economic inequality (Mishel et al., 2012). In response to the changing labor market conditions, states adopted exceptions to the conventional employment-at-will doctrine, often known as wrongful discharge laws, that provide employment protection that had not been available to employees. The WDLs, however, burden employers with higher labor costs and poor operating flexibility. These costs include direct costs associated with labor lawsuits as well as indirect costs firms take to protect themselves from lawsuits or losses from lawsuits, such as greater severance pay and the purchase of Employment Practices Liability Insurance.

We empirically investigate the affect of WDLs on VC investment across the U.S. states in 1970-2003, and confirm that VC investment declines after a state adopts the WDLs, especially the good faith exception and the implied contract exception. We address the identification problem with a difference-in-differences framework that is supported by various tests. The negative effect is economically large: the good faith exception decreases the number of VC deals by 14 percent and the dollar amount of VC investment by about one third; the corresponding declines are 10 percent and 18 percent, respectively after the adoption of the implied contract exception.

Complementing the prior literature on employment protection, our findings highlight the unintended consequences of WDLs and illustrate a tradeoff between efficiency and equality.

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Table 1. Variables

Variable	Definition
Venture capital investment	
Number of VC deals	Total number of VC deals in a given state and year. In regressions, take the logarithm of one plus the number of VC deals.
Amount of VC Investment	Total dollar amount of VC deals in a given state and year, measured in million U.S. dollars, adjusted by the Consumer Price Index (=100 in year 2000). In regressions, take the logarithm of one plus the amount.
WDL measures	
Good Faith	A dummy variable, equal to one if a state has adopted the good faith exception in a given year, and zero otherwise.
Implied Contract	A dummy variable, equal to one if a state has adopted the implied contract exception in a given year, and zero otherwise.
Public Policy	A dummy variable, equal to one if a state has adopted the public policy exception in a given year, and zero otherwise.
State characteristics	
Unemployment insurance	Maximum total potential benefit available under the unemployment insurance system in a given state and year. The logarithm of the value is used in regressions.
Population	Population in a given state and year, in millions. The logarithm of the value is used in regressions.
GDP	Gross domestic product of a state in a given year, in billion dollars. The logarithm of the value is used in regressions.
Real GDP growth	Percentage growth rate of state GDP in a given year.
Political balance	Ratio of the Democrat-to-Republican representatives in the House of Representatives for a given state and year.
Number of colleges	Number of degree-granting higher education institutions in a given state and year. The logarithm of the value is used in regressions.
College enrollment	Number of enrollment in higher education institutions in a given state and year. The logarithm of the value is used in regressions.
More variables in hazard model	
Circuit Good Faith	The fraction of other states in the same federal circuit region that have adopted the good faith exception in a given year.
Circuit Implied Contract	The fraction of other states in the same federal circuit region that have adopted the implied contract exception in a given year.
Circuit Public Policy	The fraction of other states in the same federal circuit region that have adopted the public policy exception in a given year.
Union membership density	The fraction of nonagricultural employees in a state who are union members.
Unemployment rate	The fraction of workers in a state who are in the labor force but unemployed.
ΔUnion membership density	Change in union membership density in a state from the previous year.
ΔUnemployment rate	Change in unemployment rate in a state from the previous year.

Table 2. Summary statistics

This table presents the summary statistics of variables at the state level during the 1970-2003 sample period. Variable definitions are in Table 1.

Variable	N	Mean	Median	Std Dev	Min	Max
Number of VC deals	1700	26.5	3	106.4	0	2,020
Amount of VC deals ($m)	1700	177.4	6.5	1,150	0	33,335
Good Faith (GF)	1700	0.15	0	0.35	0	1
Implied Contract (IC)	1700	0.54	1	0.50	0	1
Public Policy (PP)	1700	0.48	0	0.50	0	1
Unemployment insurance ($)	1700	5,150	4,836	2,731	1,040	23,040
Population (m)	1700	4.85	3.29	5.25	0.30	35.25
GDP ($bn)	1700	100.5	46.8	152.6	1.9	1,527.3
Real GDP growth rate (%)	1700	2.87	2.79	4.30	-27.44	45.31
Political balance	1700	2.66	1.17	3.54	0	11.00
Number of colleges	1700	68	49	66	3	419
College enrollment ('000)	1700	252.8	165.25	311.0	10.0	2,474
Circuit Good Faith	1700	0.145	0	0.229	0	0.667
Circuit Implied Contract	1700	0.537	0.667	0.429	0	1
Circuit Public Policy	1700	0.482	0.500	0.400	0	1
Union membership density	1700	0.174	0.166	0.080	0.031	0.424
Unemployment rate	1400	0.060	0.057	0.020	0.023	0.178
Δ Union membership density	1350	-0.001	-0.002	0.010	-0.036	0.039
Δ Unemployment rate	1650	-0.004	-0.004	0.015	-0.068	0.072

Table 3. WDLs and state-level VC investment

This table presents the different-in-differences (DD) estimates of the effect of Good Faith, Implied Contract, and Public Policy exceptions to at-will employment on state-level VC investment in the 1970-2003 period. The dependent variables are ln(number of VC deals) and ln(dollar amount of VC Deals) in a state-year. *Good Faith* is an indicator variable set to one if the state has passed the good faith exception by the year and zero otherwise. *Implied Contract* and *Public Policy* are indicators defined similarly. State characteristics, as defined as in Table 1, are controlled for in specification (2). Standard errors are clustered at the state level and *Pr* > |*t*| is reported in the parentheses. *, ** and *** mark statistical significance at the 10, 5, and 1 percent level, respectively.

	Ln(Number of VC Deals)		Ln(Amount of VC Deals)	
	(1)	(2)	(1)	(2)
Good Faith (GF)	-0.122 *	-0.149 **	-0.324 ***	-0.402 ***
	(0.073)	(0.033)	(0.002)	(0.000)
Implied Contract (IC)	-0.119 *	-0.107 *	-0.215 **	-0.193 **
	(0.062)	(0.073)	(0.026)	(0.036)
Public Policy (PP)	-0.156 ***	-0.091	-0.122	-0.019
	(0.007)	(0.101)	(0.169)	(0.829)
Unemployment insurance		0.337 **		0.227
		(0.012)		(0.272)
Ln(state population)		-0.739 ***		-1.234 ***
		(0.004)		(0.004)
Ln(real state GDP)		1.517 ***		2.375 ***
		(0.000)		(0.000)
Real GDP growth rate		1.757 ***		2.533 ***
		(0.000)		(0.000)
Log(Political balance)		-0.043 *		-0.131 ***
		(0.087)		(0.001)
Ln(Colleges)		-0.251 **		-0.286 *
		(0.015)		(0.071)
Ln(College enrollment)		-0.149		-0.255
		(0.193)		(0.149)
State fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
F-test for fixed effects:				
Pr > F	<0.001	<0.001	<0.001	<0.001
Observations	1,700	1,700	1,700	1,700
R^2	0.859	0.873	0.823	0.846

Table 4. WDLs and state-level VC investment in alternative samples

This table presents the different-in-differences (DD) estimates of the effect of Good Faith, Implied Contract, and Public Policy exceptions to at-will employment on state-level VC investment in samples that are different from the baseline investigation. The dependent variables are ln(number of VC deals) and ln(dollar amount of VC Deals) in a state-year. *Good Faith* is an indicator variable set to one if the state has passed the good faith exception by the year and zero otherwise. *Implied Contract* and *Public Policy* are indicators defined similarly. Standard errors are clustered at the state level and *Pr* > |*t*| is reported in the parentheses. *, ** and *** mark statistical significance at the 10, 5, and 1 percent level, respectively.

	Sample period 1980-2003		Sample period 1970-2008		Excluding CA & MA		Excluding AK	
	N(VC deals)	$(VC deals)	N(VC deals)	$(VC deals)	N(VC deals)	$(VC deals)	N(VC deals)	$(VC deals)
Good Faith	-0.312 ***	-0.500 ***	-0.207 ***	-0.456 ***	-0.413 ***	-0.710 ***	-0.094	-0.339 ***
	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)	(0.184)	(0.001)
Implied Contract	-0.052	-0.122 **	-0.125 **	-0.207 **	-0.061	-0.144	-0.084	-0.164 *
	(0.360)	(0.216)	(0.030)	(0.020)	(0.314)	(0.132)	(0.156)	(0.074)
Public Policy	0.079	0.196 *	-0.098 *	-0.043	-0.053	0.005	-0.081	-0.004
	(0.168)	(0.058)	(0.068)	(0.596)	(0.349)	(0.953)	(0.142)	(0.939)
State characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,200	1,200	1,950	1,950	1,632	1,632	1,666	1,666
R^2	0.924	0.886	0.883	0.859	0.849	0.823	0.876	0.849

Table 5. Relative timing of WDL adoption and VC investment change

This table presents the results from OLS regressions relating the timing of state-level VC investment to the enactment of Good Faith (GF) and Implied Contract (IC) exceptions to at-will employment during 1970-2003. The dependent variables are ln(number of VC deals) and ln(dollar amount of VC Deals) in a state-year. *Good Faith*$^{-1}$ (*Implied Contract*$^{-1}$) is an indicator variable set to one if a state will adopt the GF exception (IC exception) in one year and zero otherwise. *Good Faith*^{0} (*Implied Contract*^{0}) is an indicator variable set to one if a state adopts the GF (IC) exception in the current year and zero otherwise. *Good Faith*^{1} (*Implied Contract*^{1}) is an indicator variable set to one if a state adopts the GF (IC) exception in the preceding year and zero otherwise. *Good Faith*$^{2+}$ (*Implied Contract*$^{2+}$) is an indicator variable set to one if a state adopts the GF (IC) exception two or more years ago and zero otherwise. *Public Policy* is an indicator that is equal to one if the state has adopted the public policy exception in year t. defined similarly. Standard errors are clustered at the state level and *Pr* > |*t*| is reported in the parentheses. *, ** and *** mark statistical significance at the 10, 5, and 1 percent level, respectively.

	Ln(Number of VC Deals)				Ln(Amount of VC Deals)			
	(1)		(2)		(1)		(2)	
Good Faith^{-1}	-0.243		-0.236		-0.421		-0.446	*
	(0.159)		(0.154)		(0.115)		(0.081)	
Good Faith^{0}	-0.404	**	-0.320	*	-0.568	**	-0.481	*
	(0.020)		(0.066)		(0.034)		(0.060)	
Good Faith^{1}	-0.335	*	-0.267		-0.424		-0.371	
	(0.173)		(0.108)		(0.113)		(0.148)	
Good Faith^{2+}	-0.166	**	-0.199	***	-0.406	***	-0.504	***
	(0.022)		(0.008)		(0.000)		(0.000)	
Implied Contract^{-1}	-0.125		-0.130		-0.115		-0.121	
	(0.220)		(0.181)		(0.465)		(0.417)	
Implied Contract^{0}	-0.091		-0.094		-0.008		-0.016	
	(0.381)		(0.342)		(0.959)		(0.919)	
Implied Contract^{1}	-0.156		-0.158		-0.301	*	-0.309	**
	(0.139)		(0.115)		(0.064)		(0.046)	
Implied Contract^{2+}	-0.159	**	-0.146	**	-0.218	*	-0.191	*
	(0.031)		(0.039)		(0.055)		(0.079)	
Public Policy	-0.153	***	-0.086		-0.130		-0.027	
	(0.009)		(0.125)		(0.148)		(0.760)	
Control variables	No		Yes		No		Yes	
State fixed effects	Yes		Yes		Yes		Yes	
Year fixed effects	Yes		Yes		Yes		Yes	
F-test for fixed effects:								
Pr > F	<0.001		<0.001		<0.001		<0.001	
Observations	1,700		1,700		1,700		1,700	
R^2	0.859		0.874		0.830		0.847	

Table 6. Hazard model of adoption of WDL exceptions

This table reports the estimation coefficients of Cox proportional hazard models in which the "failure events" are the adoption of Wrongful Discharge Laws (WDL), including the Good Faith, Implied Contract, and Public Policy exceptions, respectively, in a given U.S. state during the 1970-2003 period. For each exception, states are dropped from the sample once they pass the exception. Explanatory variables including VC investment in a state, state characteristics, other WDL exceptions, and the WDL adoption rate in the circuit, all measured as of year t-1. Variable definitions are in Table 1. Standard errors are clustered at the state level and *Pr* > |*t*| is reported in the parentheses. *, ** and *** mark statistical significance at the 10, 5, and 1 percent level, respectively.

	Good Faith		Implied Contract		Public policy	
	(1)	(2)	(1)	(2)	(1)	(2)
Ln(Number of VC deals)	0.431		0.161		-0.284	
	(0.307)		(0.472)		(0.412)	
Ln(Amount of VC deals)		0.052		0.0023		-0.203
		(0.853)		(0.988)		(0.357)
Good Faith (PP)			-0.374	-0.204	1.710 **	1.846 **
			(0.562)	(0.745)	(0.014)	(0.010)
Implied Contract (IC)	-0.410	-0.423			0.220	0.194
	(0.653)	(0.637)			(0.482)	(0.693)
Public Policy (PP)	-0.684	-0.772	0.688	0.650		
	(0.532)	(0.479)	(0.182)	(0.201)		
Circuit Good Faith	3.513	3.715				
	(0.139)	(0.119)				
Circuit Implied Contract			-1.535	-1.699		
			(0.129)	(0.101)		
Circuit Public Policy					1.939	1.988
					(0.178)	(0.172)
Unemployment insurance	-5.835 **	-5.490 **	-3.942 ***	-3.741 ***	-4.019 ***	-4.026 ***
	(0.013)	(0.017)	(0.000)	(0.000)	(0.000)	(0.000)
Population	-3.249 **	-3.055 **	-1.196	-1.118	2.230 *	2.265 *
	(0.039)	(0.029)	(0.185)	(0.205)	(0.074)	(0.071)
GDP	2.382	2.565	0.799	0.871	-2.492 *	-2.524 **
	(0.126)	(0.102)	(0.407)	(0.361)	(0.050)	(0.047)
Real GDP growth rate	-0.102	0.280	-3.524	-2.764	-0.474	0.038
	(0.985)	(0.958)	(0.397)	(0.489)	(0.918)	(0.994)
Union membership density	5.004	4.242	14.475 ***	14.517 ***	16.266 ***	16.190 ***
	(0.400)	(0.469)	(0.000)	(0.000)	(0.000)	(0.000)
Unemployment rate	18.919	15.841	-2.235	-3.935	-3.801	-3.889
	(0.130)	(0.190)	(0.752)	(0.586)	(0.733)	(0.730)
Δ Union membership density	-18.236	-17.127	-5.489	-5.369	-1.046	-0.946
	(0.257)	(0.284)	(0.559)	(0.571)	(0.920)	(0.929)
Δ Unemployment rate	14.072	12.304	15.743	14.587	1.940	1.964
	(0.558)	(0.620)	(0.250)	(0.280)	(0.908)	(0.906)
Observations	1,105	1,105	445	445	543	543
Pseudo R^2	0.032	0.031	0.151	0.150	0.128	0.128

Table 7. Falsification Test: Randomized enactment of WDL exceptions

This table presents the summary statistics of estimated coefficients of Good Faith, Implied Contract, and Public Policy in 500 falsification samples. To create a falsification sample, we randomly select 14 states as having adopted the Good Faith exception during the 1970-2003 sample period, and for each of these states randomly assign an enactment year. Likewise, we randomly assign an Implied Contract enactment year to 46 states and a Public Policy enactment year to 40 states. Then we define indicator variables Good Faith (GF), *Implied Contract (IC), and Public Policy (PP)*, as equal to one after the enactment of the Good Faith, Implied Contract, and Public Policy exception, respectively. Difference-in-differences test are conducted in each falsification sample to relate the enactment of these WDL exceptions to the number of VC deals and dollar amount of VC deals at the state level, and estimated coefficients of GF, IC and PP are recorded for all the 500 falsification samples. t-test and Wilcoxin signed rank test are used to test if the mean and median, respectively, are statistically different to zero, and *Pr* > |*t*| and *Pr* > |*S*| are reported accordingly in the last two columns.

Dependent Variable	Model	Independent Variable	N	Mean	Median	Std Dev	Mean ≠0 *Pr* > |*t*|	Median ≠0 *Pr* > |*S*|
Ln(# of VC deals)	W/o state characteristics	**GF**	500	-0.004	-0.002	0.239	0.682	0.729
		IC	500	0.003	0.010	0.134	0.677	0.633
		PP	500	-0.002	0.006	0.135	0.788	0.960
	W/ state characteristics	**GF**	500	-0.001	0.002	0.207	0.895	0.917
		IC	500	0.003	0.009	0.122	0.621	0.518
		PP	500	-0.001	-0.001	0.122	0.888	0.902
Ln($ of VC deals)	W/o state characteristics	**GF**	500	-0.003	0.000	0.326	0.837	0.873
		IC	500	0.000	0.006	0.186	0.967	0.987
		PP	500	0.000	0.001	0.184	0.984	0.876
	W/ state characteristics	**GF**	500	0.001	0.000	0.279	0.945	0.776
		IC	500	0.001	0.001	0.168	0.887	0.746
		PP	500	0.002	-0.001	0.164	0.811	0.865

Table 8. WDL, creation of new firms, and VC funding rate of new firms

This table presents the different-in-differences (DD) estimates of the effect of Good Faith, Implied Contract, and Public Policy exceptions to at-will employment on creation of new firms and the fraction of new firms that are funded by VC at the state level in the 1970-2003 period. The dependent variables are *Establishments*, *VC deals/Establishments*, and *VC deals/firms*, the latter two are referred to as VC funding rates. *Establishments* is measured as the logrithm of number of establishments with age 0 in a state. *VC deals/Establishments* is the number of VC deals divided by the number of establishments created in the past 3-year, or 5-year, periods in a state. *VC deals/ Firms* is the number of VC deals divided by the number of firms created in the preceding 3-, and 5-, year periods in a state. VC funding rate variables are winsorized at the 99th percentiles. *Good Faith* is an indicator variable set to one if the state has passed the good faith exception by the year and zero otherwise. *Implied Contract* and *Public Policy* are indicators defined similarly. State characteristics are controlled for. Standard errors are clustered at the state level and *Pr* > |*t*| is reported in the parentheses. *, ** and *** mark statistical significance at the 10, 5, and 1 percent level, respectively.

	Establishments	VC deals/Establishments		VC deals/Firms	
		3-year	5-year	3-year	5-year
Good Faith (GF)	0.052 ***	-1.607 **	-0.961 **	-1.625 **	-0.972 **
	(0.000)	(0.046)	(0.043)	(0.044)	(0.043)
Implied Contract (IC)	-0.020 **	-1.018 *	-0.702 **	-1.021 *	-0.705 **
	(0.022)	(0.088)	(0.047)	(0.091)	(0.048)
Public Policy (PP)	-0.012	-0.043	0.076	-0.049	0.076
	(0.162)	(0.940)	(0.825)	(0.934)	(0.828)
Unemployment insurance	-0.071 ***	5.601 ***	2.844 ***	5.651 ***	2.868
	(0.007)	(0.001)	(0.004)	(1.703)	(0.004)
Ln(state population)	-0.017	-4.428	-2.429	-4.438	-2.437
	(0.772)	(0.191)	(0.224)	(0.194)	(0.227)
Ln(real state GDP)	0.716 ***	12.248 ***	7.490 ***	12.325 ***	7.542 ***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Real GDP growth rate	0.033	0.882	1.585	0.844	1.594
	(0.655)	(0.858)	(0.586)	(0.865)	(0.588)
Log(Political balance)	-0.006	0.349	0.247	0.346	0.247
	(0.155)	(0.219)	(0.141)	(0.227)	(0.145)
Ln(Colleges)	-0.056 ***	-1.529	-1.048	-1.532	-1.049
	(0.007)	(0.225)	(0.159)	(0.228)	(0.162)
Ln(College enrollment)	0.045 **	-3.461 ***	-1.748 **	-3.502 ***	-1.772 **
	(0.019)	(0.008)	(0.023)	(0.008)	(0.022)
State fixed effects	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes
F-test for fixed effects:					
Pr > F	<0.001	<0.001	<0.001	<0.001	<0.001
Observations	1,300	1,300	1,300	1,300	1,300
R^2	0.995	0.797	0.802	0.793	0.802

Table 9. WDL and VC investment at the state-sector level

Panel A reports the distribution of VC deals in the 1970s, 1980s and post-1980s periods during our sample period. Panel B presents the different-in-differences estimates of the effect of Good Faith, Implied Contract, and Public Policy exceptions to at-will employment on VC investment at the state-sector level in the 1980-2003 period. The dependent variables are ln(number of VC deals) and ln(dollar amount of VC Deals) in a state-sector-year. *Good Faith* is an indicator variable set to one if the state has passed the good faith exception by the year and zero otherwise. *Implied Contract* and *Public Policy* are indicators defined similarly. Sector is defined based on the European Private Equity and Venture Capital Association (EVCA) sector classifications. State characteristics are controlled for. Standard errors are clustered at the state level and *Pr* > |*t*| is reported in the parentheses. *, ** and *** mark statistical significance at the 10, 5, and 1 percent level, respectively.

Panel A. Distribution of VC deals in different periods

Period	N	Median	75th pctl	90th ptcl	95th pctl	99th pctl
1970-79	7,500	0	0	0	1	2
1980-89	7,500	0	1	3	5	18
1990-2003	10,500	0	1	5	11	54

Panel B. Difference-in-differences estimation in 1980-2003 period

	Ln(Number of VC Deals)		Ln(Amount of VC Deals)	
	(1)	(2)	(1)	(2)
Good Faith (GF)	-0.098 ***	-0.097 ***	-0.220 ***	-0.210 ***
	(0.000)	(0.000)	(0.000)	(0.000)
Implied Contract (IC)	-0.051 ***	-0.054 ***	-0.080 ***	-0.091 ***
	(0.002)	(0.002)	(0.005)	(0.002)
Public Policy (PP)	-0.008	0.009	-0.018	0.016
	(0.648)	(0.611)	(0.521)	(0.591)
Unemployment insurance		0.126 **		0.185 **
		(0.015)		(0.033)
Ln(state population)		0.004		-0.134
		(0.968)		(0.431)
Ln(real state GDP)		0.307 ***		0.706 ***
		(0.000)		(0.000)
Real GDP growth rate		0.095		0.181
		(0.491)		(0.435)
Log(Political balance)		-0.022 ***		-0.042 ***
		(0.010)		(0.003)
Ln(Colleges)		-0.054		-0.149 **
		(0.136)		(0.015)
Ln(College enrollment)		-0.089 **		-0.154 **
		(0.019)		(0.017)
State fixed effects	Yes	Yes	Yes	Yes
Sector-year fixed effects	Yes	Yes	Yes	Yes
F-test for fixed effects:				
Pr > F	<0.001	<0.001	<0.001	<0.001
Observations	18,000	18,000	18,000	18,000
R^2	0.589	0.591	0.553	0.558

Table 10. Relative timing of WDL adoption and VC investment at the state-sector level

This table presents the different-in-differences estimates of the effect of Good Faith, Implied Contract, and Public Policy exceptions to at-will employment on the dynamics of VC investment at the state-sector level in the 1980-2003 period. The dependent variables are ln(number of VC deals) and ln(dollar amount of VC Deals) in a state-sector-year. *Good Faith-1 (Implied Contract-1)* is an indicator variable set to one if a state will adopt the GF exception (IC exception) in one year and zero otherwise. *Good Faith0 (Implied Contract0)* is an indicator variable set to one if a state adopts the GF (IC) exception in the current year and zero otherwise. *Good Faith1 (Implied Contract1)* is an indicator variable set to one if a state adopts the GF (IC) exception in the preceding year and zero otherwise. *Good Faith2+ (Implied Contract2+)* is an indicator variable set to one if a state adopts the GF (IC) exception two or more years ago and zero otherwise. *Public Policy* is an indicator that is equal to one if the state has adopted the public policy exception in year t. State characteristics are controlled for in specification (2). Standard errors are clustered at the state level and *Pr* > |*t*| is reported in the parentheses. *, ** and *** mark statistical significance at the 10, 5, and 1 percent level, respectively.

	Ln(Number of VC Deals)				Ln(Amount of VC Deals)			
	(1)		(2)		(1)		(2)	
Good Faith^{-1}	-0.028		-0.015		-0.056		-0.031	
	(0.563)		(0.756)		(0.490)		(0.706)	
Good Faith^{0}	-0.180	***	-0.152	***	-0.330	***	-0.270	***
	(0.000)		(0.001)		(0.000)		(0.000)	
Good Faith^{1}	-0.153	***	-0.131	***	-0.268	***	-0.219	***
	(0.001)		(0.004)		(0.000)		(0.004)	
Good Faith^{2+}	-0.131	***	-0.127	***	-0.287	***	-0.270	***
	(0.553)		(0.000)		(0.000)		(0.000)	
Implied Contract^{-1}	-0.016		-0.014		-0.056		-0.056	
	(0.553)		(0.606)		(0.235)		(0.234)	
Implied Contract^{0}	-0.005		-0.005		-0.011		-0.018	
	(0.861)		(0.849)		(0.818)		(0.702)	
Implied Contract^{1}	-0.033		-0.036		-0.063	*	-0.075	**
	(0.246)		(0.208)		(0.189)		(0.121)	
Implied Contract^{2+}	-0.061	***	-0.064	***	-0.103	***	-0.117	***
	(0.004)		(0.003)		(0.004)		(0.001)	
Public Policy	-0.005		0.011		-0.008		0.019	
	(0.752)		(0.514)		(0.029)		(0.518)	
Control variables	No		Yes		No		Yes	
State fixed effects	Yes		Yes		Yes		Yes	
Year fixed effects	Yes		Yes		Yes		Yes	
F-test for fixed effects:								
Pr > F	<0.001		<0.001		<0.001		<0.001	
Observations	18,000		18,000		18,000		18,000	
R^2	0.589		0.592		0.554		0.558	

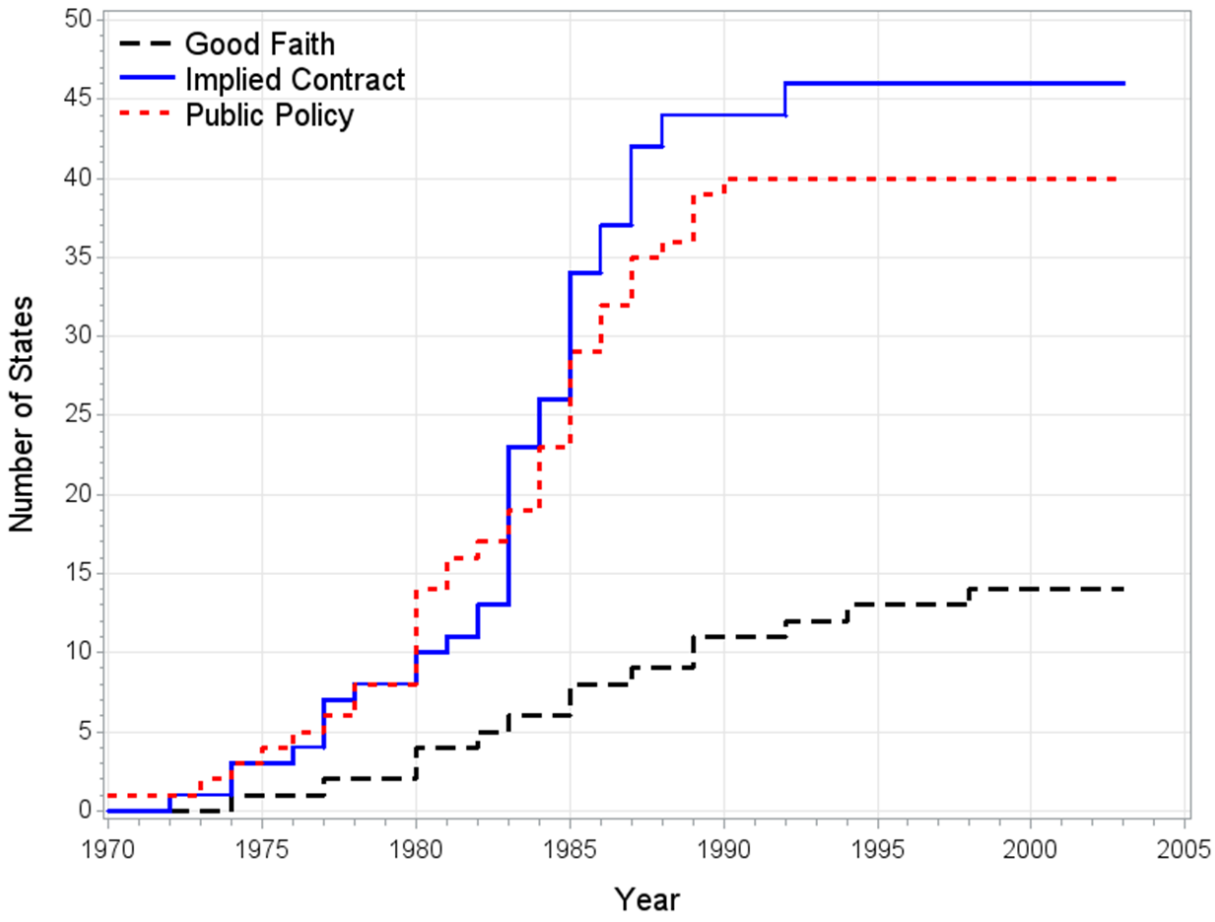

Figure 1. Number of States that Adopted Wrongful Discharge Laws Over Time

This figure the number of states that have adopted the Good Faith, Implied Contract, Public Policy exceptions to the employment-at-will rule over the 1970-2003 period.

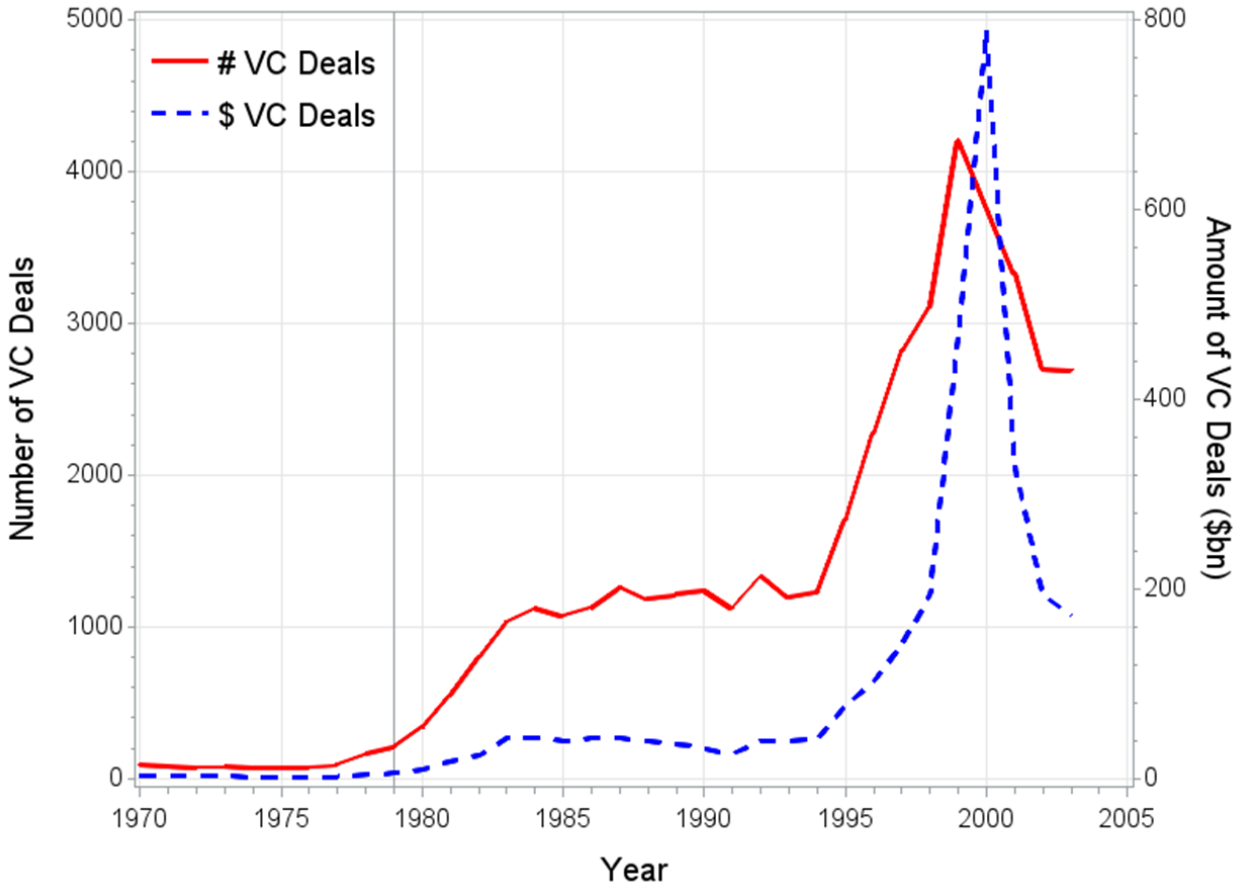

Figure 2. VC Activities in the U.S. Over Time

This figure shows the number and dollar amount of VC investment deals in the U.S. during 1970-2003. The vertical reference line in 1979 represents the year when the U.S. Department of Labor issued a clarification about the Employee Retirement Income Security Act (ERISA), which freed pensions for venture capital. Amount of VC deals are in constant year 2000 dollars.

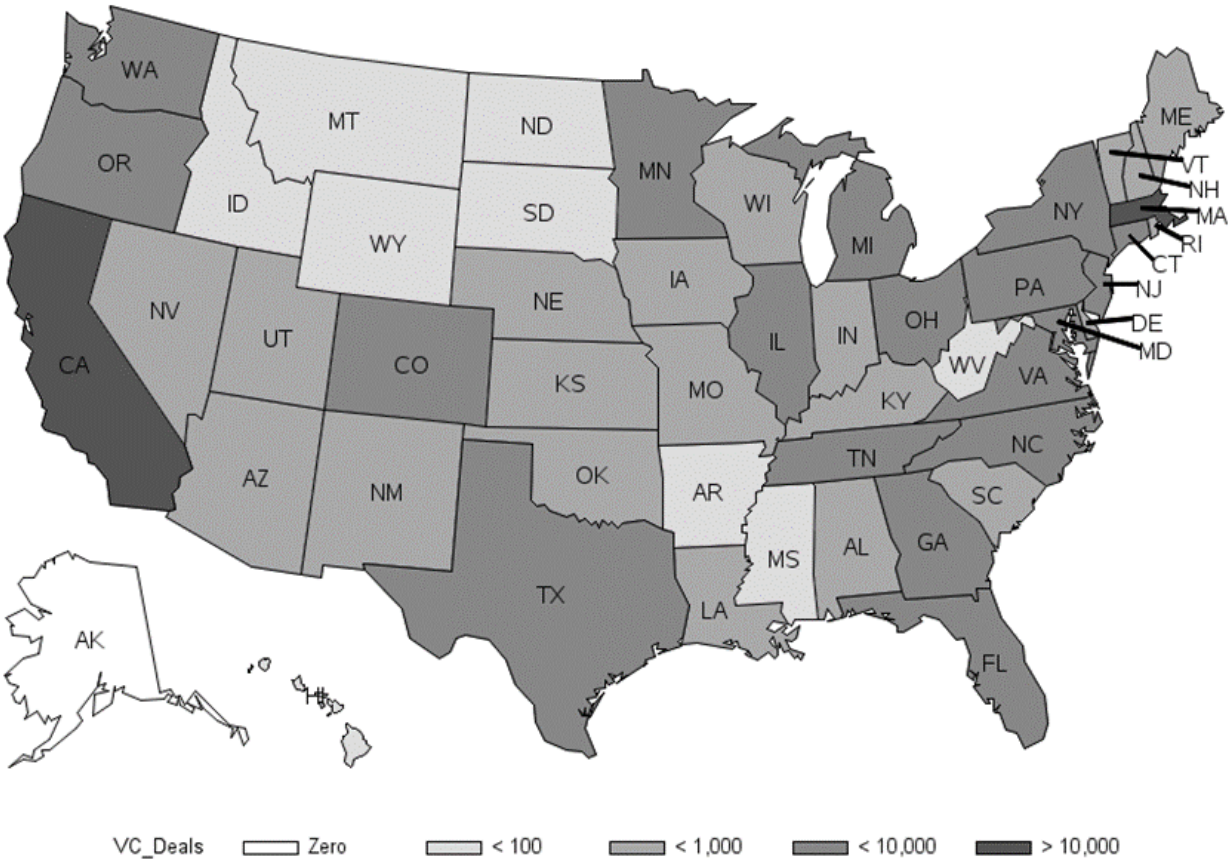

Figure 3. VC Activities across States

This figure shows the frequency of venture capital investment deals in 50 U.S. states during 1970-2003.

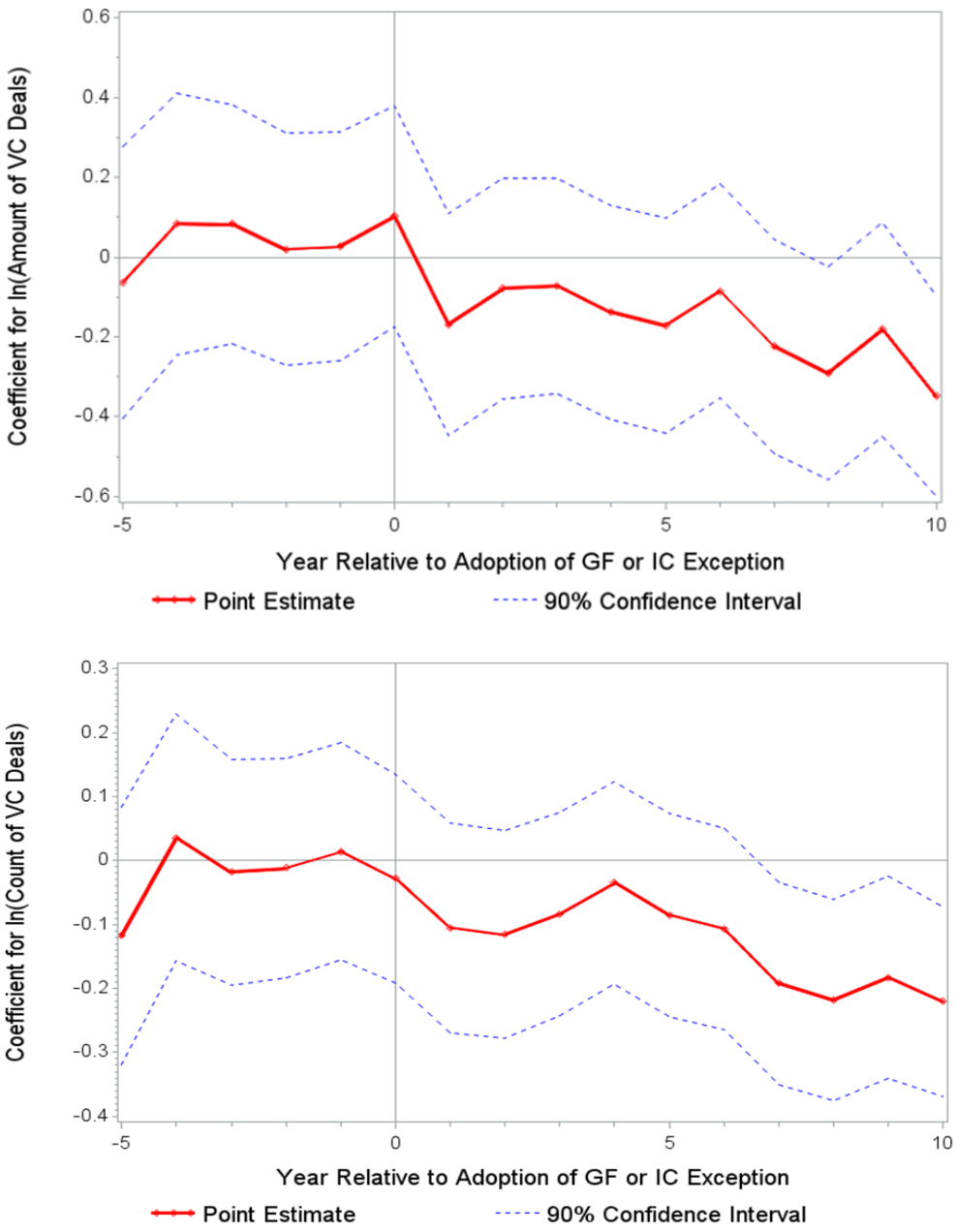

Figure 4. Changes in VC investment around adoption of GF or IC exception

This figure presents a visual difference-in-differences examining the effect of the adoption of Good Faith (GF) or Implied Contract (IC) exception on the number (the upper chart) and the dollar amount (the lower chart) of VC investment in adopting states relative to nonadopting states. In either chart, the horizontal axis represents the time relative to the year of adoption of either GF or IC exception, and the vertical axis shows the logarithm of the VC investment measure as the coefficient estimates on year dummies in the DD regression. The dashed lines show the 90% confidence intervals of the coefficient estimates, based on standard errors that are clustered at the state level.