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Abstract

This dissertation evaluates the effects of the institutional environment on investment and performance in the private equity industry. It provides insights on how trade secret protection can increase venture capital (VC) investment through a state court's favorability toward the inevitable disclosure doctrine, the effect of anti-takeover regulation as it relates to private equity firm buyout performance, and the role that political context has in determining VC distributions to different states. Data analysis is based on Thomson Reuters' VentureXpert for VC investment and geography, inevitable disclosure rulings gathered from multiple sources, a proprietary database on private equity firm buyout performance, and election results at the state and national levels of the United States. Three studies were conducted, which comprise this dissertation.

The first paper investigates how inevitable disclosure, a form of trade secret protection, affects the geography of VC investment in the United States. Results show that a rule in favor of inevitable disclosure increases the overall amount of VC inflows and the proportion of investment by non-local VCs in a state more than an against or no rule. Mechanisms are addressed that can explain these findings by considering how a court decision on inevitable disclosure might increase the probability of obtaining a court injunction against a former employee departure and the predictability of that probability.

The second paper extends experiential learning theory by arguing that the degree of causal ambiguity in firm decisions likely differs not only across different settings (i.e. operational vs. strategic), but also across different stages of the same strategic decision. With particular regard to acquisitions, the selection stage seems to be less causally ambiguous than the restructuring stage. Since experience translates into learning to a lesser extent when causal ambiguity is greater,

acquisition experience translates more readily into learning to select than into learning to add value. Accordingly, results show that more experienced acquirers should perform better in scenarios when the focal acquisition is more selection- (rather than restructuring-) oriented, such as when (1) the educational background of the acquiring firm's top management is more finance- (rather than business-) oriented; and (2) the information environment is less transparent. Results are largely consistent with the notion that correlation between acquisition experience and performance is more positive when the firm's capacity to select target companies is more relevant.

The third paper attempts to uncover the effects of political context, as it relates to VC distributions to different states across the United States. The primary finding is that VC investment distributions increase when states that elect a Republican governor also vote for a Democratic presidential candidate (regardless if that candidate wins). Additionally, as the stability of a Republican gubernatorial regime increases, VC investment decreases. Finally, results show that policies that improve the quality of financial institutions (through the number of IPOs) might help explain the political effects on VC, whereas tax policy (through capital gains tax rate) and pro-entrepreneurship policy (through the number of new firms) do not.

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1 Introduction

Private equity, which includes venture capital (VC), has become an important source for developing and nurturing economic development and entrepreneurship (Samila and Sorenson, 2011a). In the first half of 2014, over $276 billion (USD) was invested by private equity firms in the United States (Private Equity Growth Capital Council, 2014). Considering only those companies with headquarters in the U.S., the private equity industry supports over 11,130 companies and 7.5 million employees. Globally, it is estimated that there is $465 billion (USD) in buyout fund dry powder.

Because of the potential impact that private equity investment can bring to a region, policymakers have taken great interest in creating an institutional environment conducive to private equity investment with the intent of spurring economic growth and job creation (Lerner and Tåg, 2013). Using institutional theory (North, 1990; Scott, 1995), scholars have studied a broad range of topics concerning private equity and the institutional environment influenced by law makers and policymakers, such as intellectual property rights (IPRs) (Lerner and Tåg, 2013; Samila and Sorenson, 2011b), anti-takeover regulations (Armstrong, Balakrishnan, and Cohen, 2012) and the political context that helps define the institutional environment (Pe'er and Gottschalg, 2011). This dissertation outlines three research objectives that contribute to the literature in each of the aforementioned topical areas and is aimed to provide a better understanding on how variations in the institutional environment affect the private equity industry.

The second chapter discusses how a particularly strong form of trade secret protection, the inevitable disclosure doctrine, affects the geography of VC investment. The main idea in this

study is that states where trade secret protection is strong might experience two types of effects that can increase investment from VCs. If a state favors the inevitable disclosure doctrine, (1) it could reduce the possibility of employees from leaving investee firms to join a competing company and (2) it would increase the predictability of a subsequent court ruling on the doctrine. Because both these factors affect a VC's willingness to invest, state**s** that favor the doctrine would be expected to attract more investment compared to those states that are against the doctrine or have not ruled on it. While extant literature has predominantly shown that trade secret protection may have adverse effects on innovation and entrepreneurship, this result shows that there may be alternative forms of protection that can encourage and enhance investment, rather than deter it.

The third chapter presents how private equity experience acquired from buyouts translates more into learning to select targets, rather than learning to add value, such that more experienced PE firms perform better when the educational background of top managers at the PE firm is more finance-oriented. Conversely, performance is worse when the educational background of top managers are more business-oriented and the information environment is more transparent. This study extends the literature on experience and strategic decisions, namely those that occur during the selection stage, by disentangling selection-stage strategic decisions from those related to value addition.

The fourth chapter discusses how political party orientation influences VC investment. In the United States, elected officials of the state and national executive branches are affiliated with two major representative parties: the Republican Party ("Red") and the Democratic Party ("Blue"). Results show that states that have elected a Republican governor generate more VC investment when voting for a Democratic presidential candidate compared to a Republican

candidate. Additionally, as the stability of a Republican gubernatorial regime (the number of consecutive years Republican governors sit in office) increases, the amount of VC investment decreases in a state. The balance achieved from voting for a Red Governor/Blue President configuration may be driven by a state's desire for moderation in policymaking. While tax and entrepreneurship policies do not seem to be explanatory mechanisms for the political effect on VC investment, policies affecting the quality of financial markets may help explain the results from a Red governor/Blue president preference.

2 Trade Secret Protection and the Geography of Venture Capital Investments: Evidence from the Inevitable Disclosure Doctrine[1]

Abstract

This study investigates how inevitable disclosure—a legal doctrine by which an employer can enjoin a former employee from working in a job that would inevitably result in trade secret disclosure—affects the geography of VC investment. Using a dataset of VC deals realized in the United States from 1981 to 2013, we find that a rule in favor of inevitable disclosure increases the overall amount of VC inflows and the proportion of investment by non-local VCs in a state more than ruling against or no rule. We address mechanisms that can explain these findings by considering how a court decision on inevitable disclosure might increase the probability of obtaining a court injunction against a former employee and the predictability of that injunction. We also discuss managerial and policy implications of our findings.

Introduction

Venture capital plays a critical role in fostering regional entrepreneurship, innovation, and, ultimately, economic growth (Samila and Sorenson, 2011a). Given its importance, scholars and policymakers have been trying to better understand the factors that may condition the development of VC in a region. Prior work has looked at a diverse set of issues, including the presence of a stock market (e.g., Michelacci and Suarez, 2004), tax rates (Poterba, 1989), and intellectual property rights (IPRs) (e.g., Lerner and Tåg, 2013).

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[1] Submitted for review as: Kemeny, C, Castellaneta, F, Conti, R, and Veloso, F. *Trade Secret Protection and the Geography of Venture Capital Investments: Evidence from the Inevitable Disclosure Doctrine.*

With respect to the role of IPRs in VC, particular attention has been paid to the patent system (e.g., Hsu and Ziedonis, 2013; Mann and Sager, 2007), an important dimension of the IPR environment. Despite their role, patents are only part of IPRs. A further dimension of IPR policy and practice is represented by trade secrets, defined as any information that derives independent economic value, actual or potential, from not being generally known.[2] Given the breadth of knowledge potentially covered by the term, Halligan (2008: 3) argues that "the vast bulk of intangible assets are trade secret assets," whereas Risch (2007: 656) notices that trade secrets are "the most important and most heavily litigated intellectual property rights." Therefore, it appears significant to extend this line of inquiry into how legal protection associated with trade secrets might influence the presence and role of VC in a region.

To help fill this gap, we focus on the inevitable disclosure doctrine, whose rule determines whether the owner of a trade secret can (if the rule is in favor of the inevitable disclosure doctrine) or cannot (if the rule is against the inevitable disclosure doctrine) obtain a court injunction to prohibit a departing employee from working for a competitor or founding a rival firm, on the grounds that she could inevitably disclose trade secrets (Lowry, 1988). The inevitable disclosure doctrine can thus allow a company not only to protect its extant trade secrets but also to avoid the loss of valuable human capital at a competing firm's advantage.

In the United States, where the inevitable disclosure doctrine has predominantly been developed, the extent to which a state jurisdiction embraces the inevitable disclosure doctrine varies. Through its court precedents, a state may in fact adopt (a) a rule clearly in favor of

[2] More precisely, the U.S. Uniform Trade Secrets Act, §1.4, defines a trade secret to mean "information, including a formula, pattern, compilation, program device, method, technique, or process, that: (i) derives independent economic value, actual or potential, from not being generally known to, and not being readily ascertainable by proper means by, other persons who can obtain economic value from its disclosure or use, and (ii) is the subject of efforts that are reasonable under the circumstances to maintain its secrecy."

inevitable disclosure, (b) a rule clearly against, or (c) no clear rule. These scenarios could condition the decisions of venture capitalists (VCs) to invest in a region. In particular, we argue that a region embracing a rule clearly in favor of the inevitable disclosure doctrine should attract VC investments more than any other possible scenario (against, or no clear rule), for reasons related to the likelihood of obtaining a court injunction to restrict employee mobility.

VC investors would generally prefer that key employees of an invested firm do not opportunistically leave the company to pursue opportunities in competition with the former employer (Baron, Hannan, and Burton, 2001). In this respect, a precedent in favor of inevitable disclosure increases the likelihood that a VC-backed firm obtains a court injunction against a former employee hired by a competitor (Png and Samila, 2013). Furthermore, given that a state court will tend to make decisions consistent with the precedent in any similar case at hand, a case clearly in favor of inevitable disclosure also enhances the predictability of this court injunction. Higher predictability is desired not only by risk-averse VC investors, who prefer a more stable institutional environment (Malesky and Samphantharak, 2008), but also by risk-neutral investors, who might otherwise prefer to wait and see how the regulatory environment evolves before making investments (Bloom, Bond, and Van Reenen, 2007).

Clear rulings in favor of inevitable disclosure should also be more significant for non-local investors than for local ones. A trustworthy relationship with key employees at an investee company can reduce their possible opportunistic behavior—including the risk that they leave to join a competitor or found a new company (Baker, Gibbons, and Murphy, 2002; Gans, Hsu, and Stern, 2008). This is harder to accomplish for VCs who are not local (e.g., Taussig and Delios, 2014), increasing for them the importance of a clear rule in favor of inevitable disclosure in the region.

To empirically assess whether and how rulings on inevitable disclosure stimulate investment from VCs, we exploit longitudinal variation in inevitable disclosure rule in U.S. states, as determined by court precedents (Kahnke, Bundy, and Liebman, 2008; Klasa *et al.*, 2014; Malsberger, 2011; Milgrim and Bensen, 2013a; Png and Samila, 2013; Quinto and Singer, 2009; Wiesner, 2012). We find that a favorable rule on inevitable disclosure stimulates VC investments (especially those involving non-local investors) more than any alternative rule. In particular, we show that a rule in favor of inevitable disclosure increases VC investment in a state by about 83 percent compared to states where there is no rule and by approximately 53 percent compared to states where the rule is against inevitable disclosure. Additionally, having a rule in favor of inevitable disclosure increases the proportion of VC investments by non-local investors within a state. In particular, considering those investments where at least one investor comes from a different state than the investee, a favorable rule increases their proportion by 6 percent compared with having no rule on the doctrine or having a rule against it.

Overall, this paper contributes to existing research in three ways. First, it extends the literature on the impact of the institutional environment on investments (e.g., Lerner and Tåg, 2013; Pe'er and Gottschalg, 2011; Taussig and Delios, 2014), showing how and to what extent the inevitable disclosure rule conditions VC investments. Second, it extends the literature on trade secrets as an important IPR protection mechanism that affects innovation and entrepreneurship (e.g., Fosfuri and Rønde, 2004; Png, 2012a, 2012b). Third, we contribute to the literature on employer-friendly labor rules for innovation and entrepreneurship (e.g., Garmaise, 2011; Marx, Strumsky, and Fleming, 2009; Stuart and Sorenson, 2003).

Theoretical Framework and Hypothesis Development

IPR protection, inevitable disclosures and venture capital

It is well established that VC plays a critical role in fostering entrepreneurship in a region (Samila and Sorenson, 2011a). Therefore, regions and countries have been seeking to increase VC activity within their boundaries and are eager to identify policies and strategies that can have such an effect (Bottazzi and Da Rin, 2002). This has sparked a growing academic literature analyzing a variety of drivers of VC investments (Lerner and Tåg, 2013).

A first driver is the financial market, which has been shown to significantly impact VC investment. For example, previous work has demonstrated that the efficiency of a public stock market attracts VC investment by enhancing the likelihood of the investee company to be sold through an initial public offering (IPO) (Black and Gilson, 1998). In line with this idea, Jeng and Wells (2000) find that nations with more IPOs have greater VC investment. Studies have also shown that regulatory changes regarding financial markets can affect VC fundraising. For instance, the deregulation of VC investment by public pension funds introduced in 1979 led to a subsequent dramatic increase in the amount of funds flowing to the VC industry (Gompers and Lerner, 2004; Kortum and Lerner, 2000).

A second driver considered by prior research is the tax system. For example, VC activity is expected to increase when expected profits and returns increase as a result of lower capital gains tax rates (Keuschnigg and Nielsen, 2003). This was confirmed by Poterba (1989), as well as by Gompers and Lerner (1998), who found that reductions in capital gains tax rates in the United States during the 1970s and 1980s led to an increase in VC investment.

A third driver is the impact of IPR protection regulation on VC investment. The core idea is that IPRs play an important role in determining the extent to which VCs can secure investee

knowledge assets (e.g., La Porta *et al.,* 1997). Therefore, IPR protection regulation should have an important impact on VC investment. Most existing literature on IPR and VC has focused on patents, showing how they can solve uncertainty related to opportunistic behaviors of VC transaction counterparts, both before (ex-ante) and after (ex-post) the contract between investor and investee is signed. By requiring knowledge disclosure, patents make third parties better informed ex-ante about the value of a firm's knowledge base. This reduces information asymmetry between investors and investee and encourages the former to invest in the latter (Akerlof, 1970; Healy and Palepu, 2001). Ex-post, patent protection reduces the risk of unintended knowledge leakages to rivals, for instance those associated with key employees opportunistically leaving a company to pursue better opportunities. The mitigation of this risk makes VC investment more profitable (Baum and Silverman, 2004; Cao and Hsu, 2011; Häussler, Harhoff, and Müller, 2009; Hsu and Ziedonis, 2013; Mann and Sager, 2007).

To enrich this growing literature on IPR and VC, we focus on the inevitable disclosure doctrine, a particularly strong form of trade secret protection. Trade secret protection is generally considered to be broader than protection granted by other IPRs, including patents, copyrights, and trademarks (Besen and Raskind, 1991). First, whereas patent and copyright protection require subject matter to be novel, trade secret protection requires only that the subject matter derive some commercial value from not being known (Kitch, 1980). Second, patents, copyrights, and trademarks protect only explicit knowledge—that is, knowledge already articulated and stored in certain media. In contrast, trade secrets protect any proprietary knowledge that is not known to others and that can provide a competitive advantage, be that explicit or tacit knowledge. For instance, trade secret protection may not only encompass chemical formulae and customer lists, both of which can be stored and represent explicit knowledge, but can also include 'negative

know-how' obtained by previously attempted but failed techniques or procedures (Graves, 2006), which is essentially tacit knowledge. Finally, unlike patent protection, trade secret protection is exempt from having an expiration date and may live as long as the knowledge is kept secret. The economic importance of trade secret protection for firms and regions has been clearly demonstrated by prior work. For example, higher levels of trade secret protection have been shown to increase firm profits and to stimulate regional clusters (Fosfuri and Rønde, 2004), encourage more R&D investment (Png, 2014), and decrease labor mobility (Png, 2012).

A critical element associated with the role of trade secrets, as in all dimensions of IPR, is enforceability. Although several aspects contribute to the enforceability of trade secrets (David, 1993), the extent to which they are in fact protected may critically depend on whether a jurisdiction embraces the inevitable disclosure doctrine. This doctrine determines whether the owner of a trade secret can (if the rule is in favor of the inevitable disclosure doctrine) or cannot (if the rule is against the inevitable disclosure doctrine) obtain a court injunction to prohibit a departing employee from working for a competitor, on the grounds that he or she could inevitably disclose trade secrets (Lowry, 1988).

In the United States, where the inevitable disclosure doctrine has been predominantly developed, the rule is established through court precedents. This means that once the rule of law is established for the first time by a court for a particular case, it is thereafter referred to when similar cases are decided, effectively binding the future—which is the essence of the *stare decisis* principle (Hart, 2012; Horwitz, 1977; Landes and Posner, 1976).[3] Hence, when a precedent in favor of inevitable disclosure is set, the doctrine can be used as an effective tool to prevent

[3] While there is a possibility that individual courts might deviate from precedent, the appeals process to higher courts within each state lowers the probability that any disregard for precedent is systematic (Landes and Posner, 1976).

employees from working for other competing firms, based on the belief that they might unavoidably disclose and so misappropriate trade secrets (Godfrey, 2004).

The modern form of the inevitable disclosure doctrine was defined in 1995 with the Seventh Circuit's decision in *PepsiCo, Inc. v. Redmond.* Despite other decisions having embraced the inevitable disclosure doctrine as a further reason to enforce a non-compete agreement[4] or to grant a limited injunction,[5] *PepsiCo, Inc. v. Redmond* was the first court decision to issue a very *broad* injunction, which prohibited de facto a departing employee who had not signed a non-compete agreement from working for a competitor, on the grounds that he or she would inevitably disclose trade secrets (Mulcahy and Tassin, 2003).[6] The defendant in that case was a high-level manager at PepsiCo who left to join a rival company. He had signed a confidentiality agreement with PepsiCo but had not entered into a covenant not to compete. The Seventh Circuit nonetheless affirmed a preliminary injunction restraining the new employment, explaining that a plaintiff may prove trade secret misappropriation by showing that defendant's new employment will inevitably lead him to rely on the plaintiff's trade secrets.

Since the PepsiCo case, six states (Illinois, Iowa, New York, Pennsylvania, Utah, and Washington) have embraced the PepsiCo interpretation of the doctrine, and five states (California, Florida, Maryland, Massachusetts, and Virginia) have clearly rejected it. Another four states (Louisiana, Minnesota, New Jersey, and North Carolina) had, even before 1995, rejected inevitable disclosure as an independent claim under which a court might enjoin a former employee from working for a competitor. In the remaining states, there is still uncertainty

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[4] *Eastman Kodak Co. v. Powers Film Prod.,* 189 A.D. 556 (N.Y.A.D. 1919)
[5] *B. F. Goodrich Co. v. Wohlgemuth,* 117 Ohio App. 493, 192 N.E.2d 99 (1963)
[6] Furthermore, another important characteristic of *PepsiCo, Inc. v. Redmond* is that the trade secrets involved in the case were not of a technical nature, as was generally true in earlier cases considering inevitable disclosure.

regarding a company's ability to prevent an employee from moving to a competitor in the absence of a non-competition covenant.

Although a large body of law literature has been devoted to studying the inevitable disclosure doctrine (e.g., Edelstein, 1996; Lowry, 1988; Whaley, 1998), this issue has received far less attention in the fields of management and public policy. In these areas, research on inevitable disclosure has only started to emerge in the last decade (Graves and DiBoise, 2006; Hyde, 2003; Png and Samila, 2013), probably because most of the inevitable disclosure cases in the United States happened between 1995 and 2004. Furthermore, previous literature has mainly focused on how inevitable disclosure rule could limit employee mobility, showing that rulings in favor of inevitable disclosure were associated with substantially lower mobility of technical workers (Png and Samila, 2013). However, research has not considered whether the court rulings in a jurisdiction may condition VC investment decisions.

Inevitable disclosure rule and VC investments

In all firms, but especially in start-ups, performance outcomes depend on a few critical employees, such as founders, who nurture the business (Campbell and Ganco, 2012; Colombo and Grilli, 2005; O'Boyle Jr. and Aguinis, 2012). Besides the loss of valuable human capital, departures of key employees can lead to knowledge leakage to competitors (Kaplan and Strömberg, 2003), thus reducing the competitive edge of the firm. The possibility of these departures might also mean that potentially profitable investments led by these employees will go unfinanced (Hart and Moore, 1994). Thus, the profit of a VC-backed firm—and the return of the VC investment—will crucially depend on the permanence of key employees (including founders), who might otherwise depart to join a competitor, or to establish a spinoff (Klepper,

2007). The ease with which key employees can move is therefore likely to be important to VC investors.

Given these concerns, it is not surprising to find that, at the time of investment, VCs often establish contractual clauses that make it difficult for key employees to depart from the financed company. For example, VC investors could ask founders to sign a vesting clause, that is, "a legal arrangement in which the entrepreneurs' shares are originally held by the company" (Hellmann, 1998: 58) and awarded over a multi-year period (Gompers and Lerner, 2001). If entrepreneurs were to leave before being fully vested, they might lose shares or the company might be able to buy back earned shares at a discounted price. Frequently, VC investors also mandate that VC-backed firms use non-compete clauses, which prohibit key employees from joining a competitor for a specified period of time (Kaplan and Strömberg, 2003). Although those clauses might be effective for reducing outbound mobility, entrepreneurs or key employees may seek extra compensation in exchange for signing them, which would be reflected naturally in lower VC-backed firm profits and returns from VC investments. In contrast, once a jurisdiction has embraced the inevitable disclosure doctrine, VC-backed firms could limit employee mobility through a court injunction even in the absence of any specific contractual clause.

The extent to which U.S. state jurisdictions embrace the inevitable disclosure doctrine varies substantially according to court precedents. In particular, whereas some state courts have ruled clearly in favor of or against inevitable disclosure, others have reached unclear decisions—that is, ambiguous decisions that do not clarify exactly the inevitable disclosure doctrine's scope of application—or have yet to decide on the doctrine. This generates three possible contexts for a given state: (a) a rule clearly in favor of inevitable disclosure, (b) a rule clearly against inevitable disclosure, (c) no clear rule.

With respect to the baseline case of having no clear rule, a rule in favor of inevitable disclosure should attract VC investors for two reasons related, respectively, to the expected value of obtaining a court injunction against a former employee hired by a competitor and to the predictability of that injunction. First, in the presence of a clear precedent embracing the inevitable disclosure doctrine, the likelihood of a court injunction increases (Png and Samila, 2013). This result would naturally attract VC investors, whose returns depend on the ability of the firms they invest in to retain their best employees. Second, with a clearly favorable precedent, any court will most likely apply the inevitable disclosure doctrine to any similar case at hand in the same direction as previous cases. Higher predictability of court decisions in inevitable disclosure cases, compared with a scenario where there is no rule at all, should attract both risk-averse and risk-neutral investors.

On one hand, higher predictability is clearly beneficial for risk-averse investors, who naturally prefer to invest in more predictable institutional environments (Malesky and Samphantharak, 2008). On the other hand, it might also be desirable for risk-neutral investors, who might otherwise prefer to wait and see how the regulatory environment evolves before making investments. When there is no clear precedent on the inevitable disclosure doctrine—such that it is not certain whether and to what extent might courts embrace the doctrine in future cases—VC investors may turn to non-compete clauses to prevent employee departure. Yet, money associated with drafting and negotiating these terms with key employees might be wasted if, at some point in the future, a court precedent in favor of inevitable disclosure is established. Hence, even risk-neutral investors facing an uncertain legal environment might prefer to wait and see how the environment will evolve before making investments. In real option terms,

uncertainty about the legal environment makes the "option to wait" more valuable (Bittlingmayer, 2000; Bloom *et al.*, 2007; Dixit and Pindyck, 1994).

Different from a rule in favor of inevitable disclosure, it is not apparent whether a rule against is superior to the baseline scenario of no clear rule. For instance, a clear rule against inevitable disclosure increases the predictability of a court decision and, as a result, should attract VC investment. However, it also decreases the possibility of retaining employees, as state courts would most likely allow employees to leave for other opportunities, which should translate into a decrease in VC investment. Hence, whether a rule against the inevitable disclosure doctrine increases VC investment more than not having any rule is an empirical matter. In fact, it depends on whether the benefits due to the reduction in regulatory uncertainty prevail over the costs related to the possible loss of the investee firm's key employees.

Table 2.1 summarizes the potential outcomes of having a clear rule in favor of or against inevitable disclosure, compared with the baseline scenario of having no rule, on the expected valued and the predictability of a court injunction against an employee deciding to leave for joining a competitor—and therefore on VC investments.

Table 2.1 Anticipated effect of inevitable disclosure court rulings on the expected value and predictability of a court injunction against a former employee

	With respect to having no rule	
Court ruling on inevitable disclosure	Expected value of a court injunction	Predictability of a court injunction
Favorable rule	Increase	Increase
Against rule	Decrease	Increase

Compared with the baseline no-rule scenario, a rule in favor of the inevitable disclosure doctrine—different from no rule or a rule against inevitable disclosure—increases both the expected value and the predictability of a court injunction. Hence, VCs should be more attracted to jurisdictions where there exists a rule clearly in favor of inevitable disclosure than to jurisdictions with against or no rules. Accordingly, we formulate the following hypothesis:

Hypothesis 1: A rule in favor of inevitable disclosure increases venture capital investments more than a rule clearly against inevitable disclosure or the absence of a clear rule.

A favorable rule on inevitable disclosure should be more salient for a non-local investor than for a local investor. The former, compared with the latter, is more exposed to the risk of opportunistic behaviors by the investee firm's key employees when formal rules safeguarding IPRs do not exist or are not enforced. In fact, a trustworthy transaction relationship—occurring when each party has no incentive to deviate from a correct behavior even in the absence of any safeguarding by formal institutions—is more likely to occur when the parties are geographically close to each other, for at least two reasons. First, trust is enhanced by the anticipated continuity of the relationship because expectations of payoffs from future cooperative behavior encourage cooperation in the present (Baker *et al.*, 2002). In this respect, geographically proximate parties are more likely to transact again in the future. Second, trust is reinforced by face-to-face contact, which allows for information gathering and monitoring. For example, Bönte (2008) shows that geographical proximity between buyer and supplier in the aeronautical industry increased inter-firm trust.

Hence, formal institutions protecting property rights should be less valuable for local actors than for non-local actors. For example, Taussig and Delios (2014) argue that in developing

economies, where formal institutions are typically weak in safeguarding and enforcing property rights, local private-equity firms are better than non-local firms at informally enforcing contracts. Similarly, Gans *et al.* (2008) found that the granting of a patent, a formal institution that protects IPRs, increases the probability of licensing, but this effect is muted when the patented innovation is produced in locations (such as Silicon Valley) where both the licensee and the licensor are predominantly local, such that trustworthy relationships have been built and substitute for the formal protection of IPRs.

The previous arguments suggest that a local investor's localness might help to informally prevent opportunism by a VC-backed company's key employees, including the risk of those employees opportunistically leaving the investee company to join a competitor or to found a new company. Since non-local investors are more exposed to possible opportunistic behaviors by the investee company's key employees, a favorable ruling on inevitable disclosure should be of greater relevance to them than to local investors. Hence, it should constitute a greater incentive to invest for non-local investors than for local investors. Accordingly, we formulate the following hypothesis:

Hypothesis 2: A rule in favor of inevitable disclosure increases the proportion of venture capital investments by non-local investors more than a rule clearly against inevitable disclosure or the absence of a clear rule.

Data and Estimation

Data collection

Our empirical analysis relies on a balanced panel of the 50 U.S. states and the District of Columbia from 1981 to 2013. Because variation in inevitable disclosure occurs at the state level, this is the most appropriate level of analysis. The time frame was chosen for two reasons. First,

the Thomson Reuters' VentureXpert dataset, which was used to gather data on VC investment, has limited coverage of investments realized in the 1970s and is thus fully reliable only since the 1980s (Gompers and Lerner, 2004). Second, most of the changes in rules concerning inevitable disclosure occurred during this period.

From the VentureXpert database, we collected information about the amount of equity invested per deal, the investment date, and the location of both investee and investor.[7] There were 95,346 deals completed within the relevant period, from which we excluded 153 because investee location information was unknown. State-level rulings of inevitable disclosure were gathered from various sources (Kahnke *et al.*, 2008; Klasa *et al.*, 2014; Malsberger, 2011; Milgrim and Bensen, 2013a; Png and Samila, 2013; Quinto and Singer, 2009; Wiesner, 2012).[8] Finally, we gathered state gross domestic product (GDP) data from the U.S. Department of Commerce's Bureau of Economic Analysis (BEA). Overall, we constructed a balanced panel dataset of 1,683 state-year observations.

Variables

Dependent variables

Venture capital investment. Similar to Samila and Sorenson (2011a), we defined VC investment as the equity investment associated with any VC deal at different stages of financing: seed, early, later, or in balanced stages. Deal equity was aggregated into state-year observations (by investee headquarters location and investment year).

Proportion of VC investments by non-local investors. We defined an investment as realized by non-local investors if the headquarters state (or country) of at least one VC investor

[7] Data was collected from the VentureXpert database on November 3, 2014.
[8] See Appendix: Table 2.A1.

firm differed from the headquarters state of the investee company (González-Uribe, 2014). We aggregated non-local and total investment totals into state-year observations and calculated the investments by non-local VCs. Observations with no investment amount were excluded because of their undefined values.

Independent variables

Inevitable disclosure rule. To measure inevitable disclosure rule, we first define the inevitable disclosure doctrine consistent with *PepsiCo, Inc. v. Redmond* as a legal doctrine through which, even without a covenant not to compete, an employer can enjoin a former employee from working for a competitor or founding a rival firm by demonstrating that the employee's new job duties will inevitably lead to trade secret misappropriation (Kahnke *et al.*, 2008). Based on this definition, we created three dummy variables measuring the rule on inevitable disclosure in each U.S. state, as established by court precedents, in any given year from 1981 to 2013. In particular, the *favorable* dummy equals 1 if the state courts have clearly embraced a rule in favor of inevitable disclosure. Second, the *against* dummy equals 1 if the state courts have clearly embraced a rule against inevitable disclosure. Third, the *no rule* dummy equals 1 if (a) the state courts have not ruled on inevitable disclosure or (b) they have ruled but without clarifying whether the doctrine can be applied to block an employee who has not signed a covenant not to compete.

We also evaluated whether states experienced a precedent change due to new rulings that changed the state position on the doctrine by directly overruling the past precedent (Gennaioli and Shleifer, 2007). In every state that has clearly ruled on the doctrine, no higher court has directly struck down those rulings but has only distinguished them from precedential rulings

(Malsberger, 2011; Milgrim and Bensen, 2013a; Png and Samila, 2013; Quinto and Singer, 2009).

Details on the criteria we used for identifying and codifying the most important sentences on inevitable disclosure in any state are discussed in the appendix. The resulting measures of inevitable disclosure rule are presented in Table 2.2. A more detailed list of all the sentences we took into account for measuring state rule on inevitable disclosure is presented in Table 2.A1.

Table 2.2 State rule (precedent) on inevitable disclosure

State	Year	Rule
California	1999	Against
Florida	2001	Against
Illinois	1995	Favorable
Iowa	2002	Favorable
Louisiana	1967	Against
Maryland	2004	Against
Massachusetts	1995	Against
Minnesota	1992	Against
New Jersey	1980	Against
New York	1997	Favorable
North Carolina	1976	Against
Pennsylvania	2010	Favorable
Utah	1998	Favorable
Virginia	1999	Against
Washington	1997	Favorable

Note. Sources: Kahnke *et al.,* 2008; Klasa *et al.,* 2014; Malsberger, 2011; Milgrim and Bensen, 2013; Png and Samila, 2013; Quinto and Singer, 2009; Wiesner, 2012.

Overall, our identification strategy relies on the arguably true assumption that case-specific court decisions are exogenous and so not driven by the willingness to attract VC investments or by the presence of an already active VC community. However, to verify the exogeneity assumption, we also check whether a ruling in favor or against inevitable disclosure is related to the state political orientation—which might be more or less prone to enact pro-VC policies (e.g., Pe'er and Gottschalg 2011)—and the past amount of VC investment in the state (cf. Table 2.12).

Control variables

Even though we consider the longitudinal changes in inevitable disclosure rule to be exogenous, we include control variables in the regression to limit the possibility that our results are biased due to the omission of important confounding factors.

State GDP. Using BEA data, we control for state GDP, because it is a factor that could possibly confound our results (Samila and Sorenson, 2011b). For instance, in richer states, due to a more active economic environment, it is more likely that a court will decide on cases involving the inevitable disclosure doctrine. Hence, the probability of having no rule is lower.

State fixed effects. We included state-specific fixed effects, in order to control for all time-invariant factors for each state, such as state culture.

Year fixed effects. We included year dummies to account for variations in the economic environment that might affect VC, such as annual changes in interest rates, inflation, and the national GDP.

The list of all variables and their measures is provided in Table 2.3.

Table 2.3 Operationalization of variables

Variable	Operationalization
VC investment	The amount of VC equity invested in each state (by location of investee company), in millions of nominal USD (all VC investments). Source: Thomson Reuters' VentureXpert.
VC investment by VC funds only	The amount of VC equity invested in each state (by location of investee company), in millions of nominal USD (VC funds only). Source: Thomson Reuters' VentureXpert.
Proportion of VC investments by non-local investors	The proportion of non-local investment from deals with at least one non-local investor (all VC investments). Source: Thomson Reuters' VentureXpert.
Proportion of VC investments by non-local investors (VC funds only)	The proportion of non-local investment from deals with at least one non-local investor (investments by VC funds only). Source: Thomson Reuters' VentureXpert.
Favorable rule on inevitable disclosure	Dummy equal to 1 if a state has ruled in favor of inevitable disclosure. Sources: Kahnke *et al.* 2008, Quinto and Singer 2009, Malsberger 2011, Wiesner 2012, Milgrim and Bensen 2013b, Png and Samila 2013, Klasa *et al.* 2014.
Against rule on inevitable disclosure	Dummy equal to 1 if a state has ruled against inevitable disclosure. Sources: Kahnke *et al.* 2008, Quinto and Singer 2009, Malsberger 2011, Wiesner 2012, Milgrim and Bensen 2013b, Png and Samila 2013, Klasa *et al.* 2014.
Favorable rule on inevitable disclosure (Png and Samila 2013)	Dummy equal to 1 if a state has ruled in favor of inevitable disclosure. Source: Png and Samila 2013.
Against rule on inevitable disclosure (Png and Samila 2013)	Dummy equal to 1 if a state has ruled against inevitable disclosure. Source: Png and Samila 2013.
Mixed rule on inevitable disclosure (Png and Samila 2013)	Dummy equal to 1 if a state has mixed rules or a single ambiguous decision on inevitable disclosure. Source: Png and Samila 2013.
State GDP	Annual state gross domestic product, in millions of nominal USD. Source: BEA.
New firms	The number of firms that have an age of zero years in each state. Source: Business Dynamics Statistics.
UTSA enactment	Dummy equal to 1 if a state has enacted the UTSA. Source: Milgrim and Bensen 2013a.
Non-compete enforceability index	Non-compete agreement enforceability index (on a scale from 0 to 1), where 0 equals no enforcement and 1 equals highest possible level of enforcement. Sources: Bishara 2010, Garmaise 2011, Bird and Knopf 2014.
Presidential Election (Red)	Dummy equal to 1 if a state has voted for a Republican presidential candidate in the last presidential election. Source: www.uselectionatalas.org

Methodology

We evaluated the 33-year panel using a state fixed-effects model. Thus, our methodology resembles a typical difference-in-difference strategy, through which we compare, for instance, whether states that adopted a rule in favor of inevitable disclosure experience a change in VC investments, with the changes occurring in states where there has been no rule or there has been a rule against.

Our baseline model, which we used to test hypothesis 1 and which includes year dummies to capture idiosyncratic shocks, is as follows:

$$\ln(VC\ investment_{i,t}) = \beta_0 + \beta_1 FAVORABLE_{i,t-1} + \beta_2 AGAINST_{i,t-1} + \beta_3 \ln STATEGDP_{i,t-1} + \gamma_i + c_i + \varepsilon_{i,t}, \quad (2.1)$$

where *i* indexes the state and *t* indexes the year, β the unknown parameter vectors; *VC investment*$_{i,t}$ is the amount of money invested in a certain state and year in VC deals[9]; and *FAVORABLE*$_{i,t-1}$, *AGAINST*$_{i,t-1}$, are the inevitable disclosure rule dummy variables equal to 1 if a rule clearly in favor or against inevitable disclosure was already enacted in the state and 0 otherwise. We assume that there exists a one-year lag from the time a court decision is made to when it actually has an effect on VC investments. *STATEGDP*$_{i,t-1}$ is the log of the state GDP control variable, γ_i represents the series of year fixed effects, c_i represents state fixed effects, and $\varepsilon_{i,t}$ is the error term. Regarding the error term, to account for the presence of serial correlation and to avoid inconsistent standard errors, we clustered observations at the state level—the state where companies that receive VC investment are located (Bertrand, Duflo, and Mullainathan, 2004). According to Hypothesis 1, we expect β_1 to be significantly positive and

[9] Since in some states and years the amount of VC investment is equal to 0, we added 1 before taking the logarithm. As we use the log of the dependent variable and include year fixed effects, using nominal or real values of VC investment does not change our estimates.

greater than β_2, which means that a favorable rule on inevitable disclosure leads to more VC investment, when compared with an against or no rule.

In our test of Hypothesis 2, the dependent variable is the proportion of VC investment by non-local investors. Hence, we adopted the method proposed by Papke and Wooldridge (1996) to deal with a regression in which the dependent variable is a fraction and its values are bound between 0 and 1. Specifically, they propose a quasi-maximum likelihood estimator based on the logistic distribution. This approach has several advantages over alternative solutions. First, a linear functional form of the conditional mean might miss important nonlinearities. Second, a log-odds transformation fails when the variable falls at the corners. Accordingly, we estimate the following model:

$$Proportion\ of\ VC\ investments\ by\ non-local\ investors_{i,t} = \mathrm{f}(\beta_0 + \beta_1 FAVORABLE_{i,t-1} + \beta_2 AGAINST_{i,t-1} + \beta_3 \ln STATEGDP_{i,t-1} + \gamma_i + c_i + \varepsilon_{i,t}), \quad (2.2)$$

We again expect that β_1 is positive and greater than β_2, which means that a favorable rule on inevitable disclosure leads to a higher proportion of non-local VC investment when compared with an against or no rule.

Results

In Tables 2.4, 2.5, and 2.6, we present the summary statistics for the variables used in the empirical analysis and their pairwise correlations, respectively. First of all, we found that, as expected, equity investment is unevenly distributed across states: California, Massachusetts, New York, and Texas account for a large portion of VC investment each year, whereas Alaska and Wyoming report almost no VC investment (Table 2.4). Furthermore, the majority (84%) of state-year observations had no rule on inevitable disclosure (Table 2.5). This is because most of

the inevitable disclosure cases occurred in the mid-1990s to early 2000s, whereas our sample period starts in 1981.

Table 2.4 Yearly average VC equity investment (in millions of USD), by state

State	1981–1990	1991–2000	2001–2013	State	1981–1990	1991–2000	2001–2013
Alabama	9.40	69.49	40.28	Montana	0.82	3.40	7.43
Alaska	0.35	0.35	0.00	Nebraska	0.40	33.78	16.44
Arizona	31.02	180.10	184.16	Nevada	1.46	17.85	25.91
Arkansas	0.15	10.03	11.14	New Hampshire	15.68	137.39	137.81
California	1,237.24	9,362.85	12,982.30	New Jersey	90.91	635.96	759.90
Colorado	92.08	859.64	649.96	New Mexico	4.48	9.47	41.12
Connecticut	81.64	374.98	243.98	New York	88.29	1,381.69	1,490.11
Delaware	1.56	19.09	22.97	North Carolina	21.07	401.15	404.52
District of Columbia	7.72	112.33	78.00	North Dakota	1.45	2.07	4.53
Florida	48.13	674.64	413.86	Ohio	37.74	250.54	215.09
Georgia	54.30	538.74	429.60	Oklahoma	7.48	32.01	27.55
Hawaii	0.01	24.20	11.85	Oregon	52.89	184.30	162.00
Idaho	1.53	7.83	14.58	Pennsylvania	67.69	684.92	657.04
Illinois	51.17	590.52	511.08	Rhode Island	9.28	22.38	62.57
Indiana	10.42	70.96	85.03	South Carolina	8.52	105.42	45.17
Iowa	2.49	11.13	23.85	South Dakota	0.23	0.10	3.60
Kansas	2.83	37.04	42.37	Tennessee	41.15	179.55	101.11
Kentucky	2.50	45.72	38.93	Texas	193.35	1,384.60	1,428.26
Louisiana	5.30	51.67	15.41	Utah	11.61	144.03	238.76
Maine	8.61	25.98	16.68	Vermont	3.54	8.03	21.83
Maryland	38.70	392.06	598.13	Virginia	39.48	706.37	485.39
Massachusetts	365.03	2,275.30	3,108.78	Washington	55.96	773.41	825.67
Michigan	32.61	114.24	146.75	West Virginia	1.54	3.03	8.97
Minnesota	42.84	273.79	321.26	Wisconsin	10.46	60.92	70.18
Mississippi	1.38	35.64	9.63	Wyoming	0.21	0.20	1.83
Missouri	6.02	206.32	93.15				

Table 2.5 Descriptive statistics

Variable	N	Mean	Std. Dev.	Min.	Max.
VC investment	1,683	368.18	1,767.76	0.00	43,017.95
VC investment by VC funds only	1,683	348.87	1,724.89	0.00	42,190.98
Proportion of VC investments by non-local investors	1,483	0.91	0.16	0.00	1.00
Proportion of VC investments by non-local investors (VC funds only)	1,457	0.90	0.18	0.00	1.00
Favorable rule on inevitable disclosure	1,683	0.05	0.21	0.00	1.00
Against rule on inevitable disclosure	1,683	0.11	0.31	0.00	1.00
Favorable rule on inevitable disclosure (Png and Samila 2013)	1,683	0.15	0.35	0.00	1.00
Against rule on inevitable disclosure (Png and Samila 2013)	1,683	0.05	0.21	0.00	1.00
Mixed rule on inevitable disclosure (Png and Samila 2013)	1,683	0.10	0.30	0.00	1.00
State GDP	1,683	177,694.69	250,292.10	5,436.00	2,202,678.00
New firms	1,632	9,557.66	11,214.39	569.00	74,879.00
UTSA enactment	1,683	0.68	0.47	0.00	1.00
Non-compete enforceability index	1,683	0.36	0.15	0.00	0.75
Presidential election (Red)	1,683	0.62	0.49	0.00	1.00

Table 2.6 Correlations

Variable	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.
1. VC investment	1.00													
2. VC investment by VC funds only	1.00***	1.00												
3. Proportion of VC investments by non-local investors	-0.10***	-0.10***	1.00											
4. Proportion of VC investments by non-local investors (VC funds only)	-0.11***	-0.11***	0.91***	1.00										
5. Favorable rule on inevitable disclosure	0.06*	0.05*	-0.04	-0.05	1.00									
6. Against rule on inevitable disclosure	0.28***	0.27***	-0.07**	-0.07**	-0.08**	1.00								
7. Favorable rule on inevitable disclosure†	0.03	0.02	0.01	0.02	0.51***	-0.05*	1.00							
8. Against rule on inevitable disclosure†	0.32***	0.32***	-0.11***	-0.13***	-0.05*	0.62***	-0.09***	1.00						
9. Mixed rule on inevitable disclosure†	0.06*	0.06*	-0.03	-0.03	-0.05	0.47***	-0.14***	-0.07**	1.00					
10. State GDP	0.63***	0.63***	-0.15***	-0.14***	0.25***	0.32***	0.23***	0.28***	0.25***	1.00				
11. New firms	0.49***	0.49***	-0.11***	-0.09***	0.13***	0.22***	0.20***	0.17***	0.14***	0.82***	1.00			
12. UTSA enactment	0.02	0.02	-0.00	-0.04	0.06*	0.03	0.02	0.10***	-0.01	-0.02	-0.16***	1.00		
13. Non-compete enforceability index	-0.20***	-0.20***	0.01	-0.01	0.08***	-0.04	0.20***	-0.18***	0.12***	-0.12***	-0.11***	-0.05*	1.00	
14. Presidential election (Red)	-0.17***	-0.17***	0.03	0.03	-0.17***	-0.13***	-0.12***	-0.04	-0.14***	-0.23***	-0.06*	-0.18***	-0.06*	1.00

† Png and Samila 2013.
*$p < 0.1$; **$p < 0.05$; ***$p < 0.01$.

Regression results are shown in Table 2.7. In Model 1, the dependent variable is the log of VC equity investment by state-year. In Model 2, the dependent variable is the proportion of equity investment by non-local investors in each state-year. Both models include inevitable disclosure dummy variables, as well as the GDP variable and state and year fixed effects.

In Model 1, favorable and against dummies are positive and significant ($\beta_1 = 0.605$, $p < 0.01$; $\beta_2 = 0.266$, $p < 0.05$). Given that the baseline case is represented by those states that did not have a clear ruling on inevitable disclosure, we could thus conclude that both a favorable rule and a rule against inevitable disclosure increase VC investment compared with no rule on the doctrine. In particular, having a rule in favor of inevitable disclosure increases VC investment in a state by about 83 percent, whereas a rule against inevitable disclosure increases VC investment by 30 percent. A *t*-test shows that the impact of a favorable rule is statistically greater than the impact of a rule against ($p < 0.10$), which supports Hypothesis 1.

In Model 2, we find that the decision in favor of inevitable disclosure dummy variable is positive and significant (Model 2: $\beta_1 = 0.746$, $p < 0.05$), so a favorable rule on inevitable disclosure increases the proportion of non-local VC investment**.** Moreover, a *t*-test on difference in coefficients shows that the impact of a favorable rule is significantly greater than the impact of a rule against inevitable disclosure ($p < 0.10$), which supports Hypothesis 2. Since those coefficients were estimated using a non-linear model, we also calculated the average marginal effects. In particular, we found that having a rule in favor of inevitable disclosure increases the proportion of VC investment in deals with at least one non-local investor by 6 percentage points compared with having no rule on the doctrine.

In Models 3 and 4 we replicate the analyses restricting the sample to only VCs investments from VC funds. The results are substantially the same as the baseline models.

Table 2.7 Impact of inevitable disclosure on all VC investment and investment by VC funds only

	All VC Investment		Investment by VC Funds Only	
	(1)	(2)	(3)	(4)
Variable	ln VC investment	Proportion of VC investments by non-local investors	ln VC investment	Proportion of VC investments by non-local investors
Favorable	0.605***	0.746**	0.565***	0.594**
	(0.152)	(0.312)	(0.195)	(0.266)
Against	0.266**	0.082	0.261**	0.111
	(0.125)	(0.227)	(0.129)	(0.282)
ln state GDP (t–1)	1.675***	1.266	1.583***	1.487*
	(0.326)	(0.857)	(0.342)	(0.797)
Constant	-15.762***	-10.119	-14.813***	-12.236
	(3.377)	(8.879)	(3.541)	(8.264)
State fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Clusters	51	51	51	51
Observations	1,683	1,483	1,683	1,457
Adj. R-squared	0.648	–	0.638	–
Log Likelihood	–	-314.285	–	-331.304

Notes. OLS regression results in columns (1) and (3), fractional logit regression results in columns (2) and (4). Robust standard errors in parentheses. Disturbances are clustered by state. The unit of observation is the state-year, and the data cover the 50 U.S. states (and the District of Columbia) from 1981 to 2013. In models (1) and (3), the dependent variable is the log of 1 plus VC investment. In models (2) and (4), the dependent variable is proportion of VC investments with at least one non-local investor participating in the deal. *$p < 0.1$; **$p < 0.05$; ***$p < 0.01$.

Beyond the hypotheses tested, another finding is of particular interest. As previously stated with regard to Model 1, the coefficient for a rule against inevitable disclosure was positive and significant. This suggests that for VC investors the predictability of court decisions might obstruct investment decisions more than the possibility of employees leaving. However, note that the positive effect of a rule against inevitable disclosure on VC investments disappears both when we exclude from our sample California—which ruled against inevitable disclosure in 1999—and when we restrict our sample to the period 1991–2013, when in fact all decisions in favor of the inevitable disclosure were made (cf. Table 2.8, Models 1 and 3).

We performed a number of additional analyses to assess the robustness of our results. First, when considering the impact of inevitable disclosure ruling on the overall amount of VC investments, there could be a concern that the effect of a favorable rule is mediated by an increase in entrepreneurship, in that stronger trade secret protection might encourage the entry of new companies, which in turn attracts VC investors. To rule out this possible explanation, we collected data from the U.S. Census Bureau's Business Dynamics Statistics dataset on the number of new firms created in each state from 1981 to 2012 (data on 2013 are not available).

Table 2.9 shows not only that rulings on inevitable disclosure have no significant effect on new firms (column 1) but also that the impact of a rule in favor of inevitable disclosure does not substantially change when including the number of new firms as an additional control (column 2). These findings support the idea that entrepreneurship does not mediate the effect of inevitable disclosure rulings on VC investment.

Some longitudinal changes in the institutional environment could confound the impact of inevitable disclosure rulings. For instance, variations in non-compete covenants might influence the extent to which VC investors want to invest in a region and, at the same time, might be correlated with variations in inevitable disclosure rulings. To address this issue, we also control for non-

Table 2.8 Impact of inevitable disclosure: excluding California and restricting the sample to 1991-2013

	Excluding California		1991-2013	
Variable	(1) ln VC investment	(2) Proportion of VC investments by non-local investors	(3) ln VC investment	(4) Proportion of VC investments by non-local investors
Favorable	0.607***	0.734**	0.437**	0.751**
	(0.151)	(0.313)	(0.179)	(0.314)
Against	0.220	0.122	0.143	0.111
	(0.134)	(0.315)	(0.164)	(0.315)
ln state GDP (*t*–1)	1.686***	1.345	0.839	2.269*
	(0.327)	(0.862)	(0.506)	(1.372)
Constant	-15.887***	-10.966	-7.002	-22.650
	(3.376)	(8.945)	(5.584)	(15.318)
State fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Clusters	50	50	51	51
Observations	1,650	1,450	1,173	1,068
Adj. R-squared	0.642	–	0.504	–
Log Likelihood	–	-301.991	–	-225.272

Notes. OLS regression results in columns (1) and (3), fractional logit regression results in columns (2) and (4). Robust standard errors in parentheses. Disturbances are clustered by state. The unit of observation is the state-year, and the data cover all U.S. states but California in columns (1) and (2) and all U.S. states from 1991 to 2013 in column (3) and (4). In models (1) and (3), the dependent variable is the log of 1 plus VC investment. In models (2) and (4), the dependent variable is proportion of VC investments with at least one non-local investor participating in the deal. *$p < 0.1$; **$p < 0.05$; ***$p < 0.01$.

compete enforceability in each state by using the Garmaise Noncompetition Enforceability Index (Garmaise, 2011). Because the index is restricted to the period 1992–2004, we combined it with the Bird Noncompetition Enforceability Index, which provides 1976–1994 data (Bird and Knopf, 2014).[10]

[10] Although the majority of state index scores matched in overlapping years (1992–1994), five states did not have matching values (Connecticut, Hawaii, Minnesota, South Dakota, and West Virginia). For each of these states, the Bird Index value was constant throughout the period 1976–1994. Therefore, we replaced the Bird Index value with the Garmaise Index value to provide consistency across data sets. Finally, based on Bishara (2010), we considered that no major changes in non-compete enforceability occurred over the last decade and extended the Garmaise Index values from 2004 to 2012, keeping each value constant for each state.

Table 2.9 Impact of inevitable disclosure on the number of new firms and VC controlling for new firms[a]

Variable	(1) ln new firms	(2) ln VC investment
ln new firms		0.133
		(0.363)
Favorable	0.086	0.587***
	(0.052)	(0.147)
Against	0.021	0.250*
	(0.032)	(0.126)
ln state GDP (t–1)	0.708***	1.562***
	(0.102)	(0.515)
Constant	1.244	-15.724***
	(1.060)	(3.288)
State fixed effects	Yes	Yes
Year fixed effects	Yes	Yes
Clusters	51	51
Observations	1,632	1,632
Adj. R-squared	0.667	0.653

[a] Data on the number of new firms are available until 2012.
Notes. OLS regression results are shown, with robust standard errors in parentheses. Disturbances are clustered by state. The unit of observation is the state-year, and the data cover the 50 U.S. states (and the District of Columbia) from 1981 to 2012. In Model (1), the dependent variable is the log of new firms. In Model (2), the dependent variable is the log of 1 plus VC investment.
*$p < 0.1$; **$p < 0.05$; ***$p < 0.01$.

In addition, the enactment of the Uniform Trade Secrets Act (UTSA) in 47 states between 1981 and 2012 might also correlate with state court positions on the inevitable disclosure doctrine. To control for the enactment of the UTSA, we therefore include a variable equal to 1 after the year of enactment in a certain state and 0 otherwise (Milgrim and Bensen, 2013b; Png, 2014). Appendix Table 2.A2 lists the states that have enacted the UTSA, along with the year of enactment. Table 2.10 provides alternative specifications that include measures of non-compete enforceability and UTSA adoption. Results show that both hypotheses are upheld.

Table 2.10 Impact of inevitable disclosure on VC investment with non-compete and trade secret indices

Variable	(1) ln VC investment	(2) ln VC investment	(3) ln VC investment	(4) Proportion of VC investments by non-local investors	(5) Proportion of VC investments by non-local investors	(6) Proportion of VC investments by non-local investors
Favorable	0.603***	0.601***	0.598***	0.741**	0.747**	0.740**
	(0.152)	(0.145)	(0.145)	(0.302)	(0.322)	(0.313)
Against	0.276**	0.248*	0.259**	0.105	0.085	0.102
	(0.115)	(0.126)	(0.116)	(0.224)	(0.233)	(0.231)
Non-compete	-0.591		-0.602	-3.682		-3.686*
enforceability index	(0.652)		(0.634)	(2.240)		(2.228)
UTSA Enactment		-0.101	-0.103		0.010	-0.012
		(0.091)	(0.092)		(0.253)	(0.244)
ln state GDP (t–1)	1.653***	1.683***	1.660***	0.999	1.265	0.999
	(0.331)	(0.324)	(0.330)	(0.804)	(0.860)	(0.807)
Constant	-15.326	-15.845	-15.402	-5.845	-10.098	-5.857*
	(3.466)	(3.364)	(3.451)	(8.328)	(8.935)	(8.391)
State fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Clusters	51	51	51	51	51	51
Observations	1,683	1,683	1,683	1,483	1,483	1,483
Adj. R-squared	0.648	0.648	0.648	–	–	–
Log likelihood	–	–	–	-313.552	-314.285	-313.552

Notes. OLS regression results in column (1)-(3), fractional logit regression results in column (4)-(6). Disturbances are clustered by state. The unit of observation is the state-year, and the data cover the 50 U.S. states (and the District of Columbia) from 1981 to 2013. In models (1)–(3), the dependent variable is the log of 1 plus VC investment. In models (4)–(6), the dependent variable is the proportion of VC investments with at least one non-local investor participating in the deal.
*$p < 0.1$; **$p < 0.05$; ***$p < 0.01$.

The validity of our empirical results relies on the assumption that decisions in favor of or against inevitable disclosure are exogenous, conditional on the control variables included in the regressions. As these decisions represent court rulings about specific cases and are not aimed at enacting general policies for attracting VC, we believe this assumption is reasonable. However, to more rigorously test this assumption, we run two OLS regressions predicting whether a court state will rule in favor of or against inevitable disclosure. Based on Pe'er and Gottschalg (2011), one could for instance argue that Republican ("Red") states are more likely to not only enact policies attracting VC (such as for instance lowering tax rates on capital gains), but also to select pro-VC oriented judges. However, Table 2.11 indicates that a state's Republican orientation, defined by a state's popular vote for a Republican presidential candidate[11], does not affect the court ruling on inevitable disclosure cases. We also find that the lagged amount of VC investment in the state does not affect the court position on inevitable disclosure. These findings corroborate our assumption on the exogeneity of the court decisions.

A further challenge to the difference-in-difference approach is that differential changes between states in favor of inevitable disclosure and the other states may be determined by pre-ruling difference in the time trend of dependent variables (that is, the amount of VC invested in a state, on one side, and the proportion of VC investment by non-local investors, on the other side). To tackle this issue, following Moser and Voena (2012), we check whether there existed any positive time trend with states in favor of inevitable disclosure even before they ruled. In particular, for states that did not rule on inevitable disclosure, we include all observations, whereas for states that ruled in favor of inevitable disclosure, we include just the observations

[11] This is the measure of political orientation used in Pe´er and Gottschalg (2011). Using the presence of a Red Governor as proxy of the state political orientation does not change the results.

before the year of rulings. We estimate the following equations:

$$\ln(VC\ investment_{i,t}) = \beta_0 + \beta_1 preFAVORABLE_{i,t} * YEAR_t + \beta_2 YEAR_t + \beta_3 \ln STATEGDP_{i,t-1} + \gamma_i + c_i + \varepsilon_{i,t}, \quad (2.3)$$

$$Proportion\ of\ VC\ investments\ by\ non-local\ investors_{i,t} = \mathrm{f}(\beta_0 + \beta_1 preFAVORABLE_{i,t} * YEAR_t + \beta_2 YEAR_t + \beta_3 \ln STATEGDP_{i,t-1} + \gamma_i + c_i + \varepsilon_{i,t}), \quad (2.4)$$

where $YEAR_t$ is a year trend variable and $preFAVORABLE_{i,t}$ is a variable equal to 1 for the states ruling in favor of inevitable disclosure (during the period before the actual ruling occurs). If there is no pre-existing time trend in the state in favor of inevitable disclosure, then β_1 should not be significantly different from zero in both (2.3) and (2.4). Results in Table 2.12 show in fact that no pre-existing positive time trend affects our previous findings about the positive impact of a rule in favor of inevitable disclosure on the amount of VC investments and on the proportion of VC investments by non-local investors (cf. Table 2.7).

Another potential concern relates to the findings about the proportion of non-local VC investments. One could argue that because several states are provided with limited local VC endowment (not enough to satisfy the demand of local start-ups), any factor increasing VC investments in a state would naturally increase the non-local investment component more than the local investment component, as the latter tends to be exhausted before the former. To address this issue, we measured the extent to which a state is endowed with local VC that could *potentially* serve local start-ups as the ratio between VC investments made by local VC firms outside the state and the number of local start-ups. Then, we assess the effect of inevitable disclosure rules on two

Table 2.11 Predictors of decisions in favor of or against inevitable disclosure

Variable	(1) Favorable	(2) Against
Presidential election (Red)		-0.000
		(0.005)
ln VC investment (*t*–1)	0.002	0.002
	(0.002)	(0.001)
ln state GDP (*t*–1)	-0.005	0.012
	(0.011)	(0.010)
Constant	0.056	-0.132
	(0.117)	(0.106)
State fixed effects	Yes	Yes
Year fixed effects	Yes	Yes
Clusters	51	48
Observations	1,604	1,496
Adj. R-squared	0.007	0.007

Notes. OLS regression results in columns (1) and (2). Robust standard errors in parentheses. Disturbances are clustered by state. The unit of observation is the state-year, and the data cover the 50 U.S. states (and the District of Columbia) from 1981 to 2013 for states that did not rule on ID, and up to the year of decision for the states that ruled in favor or against.
**p* < 0.1; ***p* < 0.05; ****p* < 0.01.

different subsamples composed respectively by a) those states that are provided with a relatively large amount of local VC compared with the needs of the internal start-ups, for which the previously defined ratio is equal or above the median value of the ratio in a certain year (Table 2.13, column 2); and b) those states that instead are provided with a relatively low amount of local VC compared with the needs of the internal start-ups, for which the value of the ratio is below the median (Table 2.13, column 1). The impact of a rule in favor of inevitable disclosure on the proportion of non-local investments is positive in both subsamples, which indicates that our findings also hold for those states provided with a large amount of internal VC.

Finally, we ran tests to evaluate how robust the models were to variations in our measure of inevitable disclosure ruling. Specifically, we checked whether the results change when adopting

the inevitable disclosure measure of Png and Samila (2013) and codifying the measure using dummy variables (i.e., favorable, against, and mixed). Indeed, although we are significantly indebted to Png and Samila (2013) for the construction of our measure, our coding criteria differ in that we (1) consider a state to be in favor of inevitable disclosure only when it is clear that the doctrine would be applied to restrict employee mobility regardless of the existence of a non-compete agreement, (2) do not consider mixed decisions (i.e., decisions that do not clarify a state's

Table 2.12 Potential trends in the states in favor of inevitable disclosure

Variable	(1) ln VC investment	(2) Proportion of VC investments by non-local investors
Year trend	-0.018	-0.127**
	(0.020)	(0.055)
Pre-favorable * Year trend	0.021	0.024
	(0.018)	(0.049)
ln state GDP (*t*–1)	1.723***	1.911**
	(0.339)	(0.865)
Constant	16.286	234.034**
	(36.317)	(101.078)
State fixed effects	Yes	Yes
Year fixed effects	Yes	Yes
Clusters	51	51
Observations	1,604	1,496
Adj. R-squared	0.622	–
Log likelihood	–	-292.391

Notes. OLS regression results in column (1), fractional logit regression results in column (2). Robust standard errors in parentheses. Disturbances are clustered by state. The unit of observation is the state-year, and the data cover the 50 U.S. states (and the District of Columbia) from 1981 to 2013 for states that did not rule on ID, and up to the year of decision for the states that ruled in favor. In Model (1), the dependent variable is the log of 1 plus VC investment. In Model (2), the dependent variable is the proportion of VC investments with at least one non-local investor participating in the deal.
*$p < 0.1$; **$p < 0.05$; ***$p < 0.01$.

Table 2.13 Impact of inevitable disclosure on VC investment with high local VC and low VC state subsamples

	Low Local VC states	High Local VC states
Variable	(1) Proportion of VC investments by non-local investors	(2) Proportion of VC investments by non-local investors
Favorable	1.034*	0.458*
	(0.528)	(0.257)
Against	-1.877***	0.062
	(0.678)	(0.176)
ln state GDP (*t*–1)	3.167	1.040
	(2.003)	(0.889)
Constant	-31.416	-6.808
	(20.879)	(9.401)
State fixed effects	Yes	Yes
Year fixed effects	Yes	Yes
Clusters	39	50
Observations	626	857
Log likelihood	-98.075	-196.543

Notes. Fractional logit regression results are shown, with robust standard errors in parentheses. Disturbances are clustered by state. The unit of observation is the state-year, and the data cover the 50 U.S. states (and the District of Columbia) from 1981 to 2013. The dependent variable is proportion of VC investments with at least one non-local investor participating in the deal.
*$p < 0.1$; **$p < 0.05$; ***$p < 0.01$.

position on inevitable disclosure) to be precedential, and (3) consider a newer rule, only if a higher court strikes down the precedent, thereby overruling (rather than simply distinguishing from) it. Table 2.14 shows that results are generally robust to the use of Png and Samila's (2013) measure.

Discussion and Conclusion

Most of the literature on IPR and VC has focused on patents (Hsu and Ziedonis, 2013; Mann and Sager, 2007). However, far less is known about the impact of trade secret protection on VC. In this paper, we focus specifically on the inevitable disclosure doctrine, a strong form of trade secret protection. By exploiting a longitudinal variation in inevitable disclosure rule in the United States,

Table 2.14 Impact of inevitable disclosure on VC investment using Png and Samila's (2013) inevitable disclosure measure

Variable	(1) Ln VC investment	(2) Proportion of VC investments by non-local investors
Favorable	0.457*	0.446*
	(0.122)	(0.239)
Against	0.387***	-0.331
	(0.107)	(0.242)
Mixed	0.299**	0.135
	(0.146)	(0.213)
ln state GDP (*t*–1)	1.717***	1.383
	(0.318)	(0.869)
Constant	-16.234***	-11.356
	(3.299)	(9.000)
State fixed effects	Yes	Yes
Year fixed effects	Yes	Yes
Clusters	51	51
Observations	1,683	1,483
Adj. R-squared	0.648	–
Log likelihood	–	-314.572

Notes. OLS regression results in column (1), fractional logit regression results in column (2). Robust standard errors in parentheses. Disturbances are clustered by state. The unit of observation is the state-year, and the data cover the 50 U.S. states (and the District of Columbia) from 1981 to 2013. In Model (1), the dependent variable is the log of 1 plus VC investment. In Model (2), the dependent variable is the proportion of VC investments with at least one non-local investor participating in the deal.
*$p < 0.1$; **$p < 0.05$; ***$p < 0.01$.

we show that the extent to which inevitable disclosure doctrine is embraced in a jurisdiction affects not only the overall amount of VC investment but also the proportion of VC investment by non-local investors. Specifically, we show that, compared with having no rule, a rule in favor of inevitable disclosure increases VC investment in a state by 83 percent, whereas a rule against inevitable increases VC investment by 30 percent. Furthermore, having a rule in favor of inevitable disclosure increases the proportion of VC investment in deals with at least one non-local investor by 6 percent compared with having no rule on the doctrine.

We believe this research contributes to existing literature in several ways. First, it contributes to the literature on the impact of institutions on investment (Lerner and Tåg, 2013; Pe'er and Gottschalg, 2011; Taussig and Delios, 2014). In particular, it extends previous literature on institutions and VC investment by suggesting that IPR protection might be important in solving two different types of uncertainty faced by VC investors. On one hand, it might affect *knowledge spillover uncertainty,* that is, the risk of knowledge leakages, due for instance to the mobility of key employees. This type of uncertainty has been extensively analyzed by previous research on IPR protection and VC (Hsu and Ziedonis, 2013; Mann and Sager, 2007). On the other hand, the rule on IPR protection also affects *regulatory uncertainty,* that is, predictability of court decision on IPR cases. In this respect, the finding that a *clear* rule (a rule in favor or against) on inevitable disclosure is generally preferred by investors to an unclear rule resonates with the Coasian argument that an institutional environment providing a clear definition of property rights always leads to the socially efficient outcome regardless of the initial allocation of those rights (Coase, 1960). Yet, the finding related to a rule against inevitable disclosure should not be overemphasized, as it is largely driven by a single state (i.e., California).

Second, this work extends the literature on the role of trade secrets as an important IPR protection mechanism that affects entrepreneurial ecosystems. Previous literature has already shown that trade secret protection increases firm profits and stimulates clustering (Fosfuri and Rønde, 2004), encourages R&D investment (Png, 2014), and decreases labor mobility (Png, 2012). In this study, we find that the protection of trade secrets through the adoption of the inevitable disclosure doctrine plays a role in attracting VC investment, reinforcing the idea that a form of trade secret protection, namely that of inevitable disclosure, may play an important role in the entrepreneurial environment of a region and, ultimately, in its economic growth.

Third, our research contributes to the literature on the effect of employer-friendly labor regulations on innovation and entrepreneurship (e.g., Garmaise, 2011; Marx *et al.,* 2009; Stuart and Sorenson, 2003). Previous studies have found that the factors that limit the mobility of employees—such as non-compete agreements—negatively affect entrepreneurship (Samila and Sorenson, 2011b). However, we show that the inevitable disclosure doctrine—which might also severely limit employee mobility—increases the level of VC investment, which is seen as an important instrument to support entrepreneurial growth firms. Taken together, these findings suggest that different legal means, such as inevitable disclosure and non-competes, both of which seek to limit employee mobility, may have diverse impacts on the development of the overall economy.

As with any empirical study, this work has limitations. First, a shortcoming of our study is that the database we use for retrieving information on VC, VentureXpert, does not report VC investment amounts for each individual investor, but only for each deal. Therefore, although we can measure the proportion of VC investment with at least one non-local investor, we cannot measure the amount of money invested in a firm by non-local VC investors. Future studies should try to develop also this second measure of the presence of non-local VC investors. Another limitation is that we were unable to sort out whether the positive relationship between a favorable rule on inevitable disclosure and VC investments was due mainly to an increase in the probability of obtaining a court injunction limiting employee mobility or to a decrease in the predictability of such injunction. Future research, such as a survey to VC investors, should seek to disentangle these two mechanisms and their effects on VC investment.

Despite these limitations, our study might have important managerial and policy-making implications. With a better understanding of how to attract VC, entrepreneurs might pursue

pertinent strategies for reducing uncertainty and, in so doing, receive more funding. For instance, entrepreneurs who live in regions that have rejected the inevitable disclosure doctrine should seek to leverage social ties and build trust, to decrease the possibility of employee departure, and thereby try to mitigate concerns that VCs might have when deciding on their investments. Additionally, entrepreneurs could require their company employees to sign non-compete agreements, in order to reduce VCs' uncertainty concerning employee departure. Of course, another option would be to relocate to states where the doctrine has not been rejected.

From a policy-maker perspective, we show whether and to what extent the enactment of laws protecting trade secrets by regulating employee mobility might affect the entrepreneurial ecosystem. In this respect, future studies should attempt to capture the effect of inevitable disclosure on economic performance, both at the deal level—for instance, by the internal rate of return of an investment—and at the firm level—for example, by evaluating the job creation of VC-backed companies in those states where the inevitable disclosure doctrine is adopted. Analyzing different outcomes would provide a more nuanced picture of the impact of trade secret protection on different stakeholders (VC firms, start-ups, customers, etc.). Assessing the social and private desirability of inevitable disclosure is an important topic we leave for future research.

Appendix

Measure of state inevitable disclosure rule

In codifying the sentences, we used the following criteria:

Decisions in favor. We defined a favorable decision on inevitable disclosure to be a decision that recognized the applicability of the doctrine for preventing an employee to move to a rival without requiring an accompanying non-compete agreement. For example, the prominent Illinois case *PepsiCo, Inc. v. Redmond* is a clear instance of a favorable decision on inevitable disclosure.[12] William Redmond Jr. sought to leave PepsiCo for Quaker, a competitor, but was prohibited from doing so on the basis that his new employment would "inevitably lead him to rely on the plaintiff's [PepsiCo's] trade secrets."

Decision against. We defined an *against* decision as a decision that clearly rejected the possibility to restrict employee mobility to a competitor based on the inevitable disclosure doctrine, where there is also the absence of a non-compete agreement and actual misappropriation. For instance, in the Louisiana case *Standard Brands, Inc. v. Walter T. Zumpe et al.,* Standards Brands sought to enjoin a former employee from working for a competitor in the coffee and tea business.[13] The court decided that "absent disclosure or imminent threat of disclosure, injunction should not be granted."

Unclear decision. We define an unclear decision—which is the equivalent of having no rule—as a decision that may acknowledge the existence of the doctrine but does not clarify its scope and conditions of applicability. An example of unclear decision is given by the Connecticut case *Branson Ultrasonics Corp. v. Stratman.*[14] The court accepted the inevitable disclosure doctrine only as a reinforcement of a non-compete agreement but did not clarify whether the inevitable disclosure doctrine would have been applied in the absence of a non-compete covenant.

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[12] *PepsiCo, Inc. v. Redmond*, 54 F.3d 1262, 1272 (7th Cir. 1995)
[13] *Standard Brands, Inc. v. Zumpe et al.,* 264 F. Supp. 254 (E.D. La. 1967)
[14] *Branson Ultrasonics Corp. v. Stratman,* 921 F. Supp. 909 (D. Conn. 1996)

Table 2.A1 Inevitable disclosure precedent and rule measure

State	Year	Case	Decision	Rule
California	1999	Bayer Corp. v. Roche Molecular Systems, Inc, 72 F. Supp. 2d 1111, 1112 (N.D. Cal 1999).	"The Court holds that California trade-secrets law does not recognize the theory of inevitable disclosure; indeed, such a rule would run counter to the strong public policy in California favoring employee mobility."	Against
Florida	2001	Del Monte Fresh Produce Co. v. Dole Food Co., 148 F. Supp. 2d 1326 (S.D. Fla. 2001).	"A court should not allow a plaintiff to use inevitable disclosure as an after-the-fact non-compete agreement to enjoin an employee from working for the employer of his or her choice."	Against
Illinois	1995	PepsiCo, Inc. v. Redmond, 54 F.3d 1262, 1272 (7th Cir. 1995).	"We affirm the district court's order enjoining Redmond from assuming his responsibilities at Quaker through May, 1995, and "preventing him forever from disclosing PCNA trade secrets and confidential information."	Favorable
Iowa	2002	Barilla America, Inc. v. Wright, No. 4–02-CV-90267, 2002 WL. 31165069 (S.D. Iowa Jul. 5, 2002).	"The Court will also craft the injunction broadly, enjoining Wright from taking any position in the pasta industry, so as to prevent any incentive, financial or otherwise, to disclose trade secret information."	Favorable
Louisiana	1967	Standard Brands, Inc. v. Zumpe *et al*., 264 F. Supp. 254 (E.D. La. 1967).	The court stated, "while it does not appear here that the disclosure of confidential information by [the defendant] will inevitably result from his employment by [a competitor], even if this were the consequence, no remedy could be afforded." The court cited Louisiana's statutory prohibition on non-compete agreements and strong public policy of free labor.	Against
Maryland	2004	LeJeune v. Coin Acceptors, Inc., 849 A.2d 451, 471 (Md. 2004).	"The chief ill in the covenant not to compete imposed by the inevitable disclosure doctrine is in its after-the-fact nature: The covenant is imposed after the employment contract is made and therefore alters the employment relationship without the employee's consent."	Against
Massachusetts	1995	Campbell Soup Co. v. Giles 47 F.3d 467, 472 (1st Cir. 1995).	The court states that an injunction blocking the employee cannot be granted, since "the public interest tilted in Giles' [the defendant] favor, especially given the absence of a non-competition agreement."	Against

State	Year	Case	Decision	Rule
Minnesota	1992	International Business Machine Corp. v. Seagate Technology Inc. 941 F. Supp. 98 (D. Minn. 1992).	"In the absence of a covenant not to compete or a finding of actual or an intent to disclose trade secrets, employees 'may pursue their chosen field of endeavor in direct competition' with their prior employer."	Against
New Jersey	1980	Continental Group, Inc. v. Amoco Chem. Corp., 614 F.2d 351, 359 (3d Cir. 1980).	"Risk of harm if information is inadvertently disclosed, however, is not sufficient to satisfy the standard for granting a preliminary injunction."	Against
New York	1997	DoubleClick, Inc. v. Henderson, No. 116914/97, 1997 N.Y. Misc. Lexis 577 (Sup. Ct. N.Y. Co. Nov. 7, 1997).	"Defendants are enjoined, for a period of six months from the date of this opinion, from launching any company, or taking employment with any company, which competes with DoubleClick."	Favorable
North Carolina	1976	Travenol Labs., Inc. v. Turner, 228 S.E.2d 478, 483 (N.C. Ct. App. 1976).	"North Carolina courts have never enjoined an employee from working for a competitor merely to prevent disclosure of confidential information. We approve and affirm only that part of the preliminary injunction which enjoins the defendant Turner from revealing, and the defendant Cutter from seeking to obtain any confidential information concerning the modification of the Westphalia centrifuge by plaintiff Travenol."	Against
Pennsylvania	2010	Bimbo Bakeries USA Inc. v. Botticella, No. 10-cv-00194 (E.D. Penn. Feb. 9, 2010).	"We are satisfied that there is a substantial likelihood that Defendant will not be able to perform his duties at Hostess and will not perform those duties without disclosing, whether intentionally or inadvertently, Bimbo's trade secrets."	Favorable
Utah	1998	Novell, Inc. v. Timpanogos Research Group, Inc., 46 U.S.P.Q.2d 1197 (Utah Dist. Ct. 1998).	"I have found that it is inevitable that defendants will traffic upon Novell's trade secrets and confidential technical information unless they are restrained from being in the same business Novell is in."	Favorable
Virginia	1999	Government Technology Services, Inc. v. Intellisys Technology Corp., 51 Va. Cir. 55 (Va. Cir. Ct. Oct. 20, 1999).	The court stated that Virginia does not recognize the inevitable disclosure doctrine.	Against
Washington	1997	Solutec Corp, Inc. v. Agnew, 1997 WL 794496, 8 (Wash. Ct. App.).	"The courts recognize that in some situations a broad injunction for a limited period is the only effective remedy to a threatened trade secrets violation."	Favorable

Note. Sources: Kahnke *et al.,* 2008; Klasa *et al.,* 2014; Malsberger, 2011; Milgrim and Bensen, 2013; Png and Samila, 2013; Quinto and Singer, 2009; Wiesner, 2012.

Table 2.A2 Enactment of statutes conforming to UTSA

State	Year of enactment	State	Year of enactment
Alaska	1988	Montana	1985
Arizona	1990	Nebraska	1988
Arkansas	1981	Nevada	1987
California	1985	New Hampshire	1990
Colorado	1986	New Jersey	2012
Connecticut	1983	New Mexico	1989
Delaware	1982	North Carolina	1981
District of Columbia	1989	North Dakota	1983
Florida	1988	Ohio	1994
Georgia	1990	Oklahoma	1986
Hawaii	1989	Oregon	1988
Idaho	1981	Pennsylvania	2004
Illinois	1988	Rhode Island	1986
Indiana	1982	South Carolina	1992
Iowa	1990	South Dakota	1988
Kansas	1981	Tennessee	2000
Kentucky	1990	Utah	1989
Louisiana	1981	Vermont	1996
Maine	1987	Virginia	1986
Maryland	1989	Washington	1982
Michigan	1998	West Virginia	1986
Minnesota	1981	Wisconsin	1986
Mississippi	1990	Wyoming	2006
Missouri	1995		

Note. Source: Milgrim and Bensen, 2013a.

3 Learning to Do What? How Acquisition Experience Affects Learning to Select and Add Value in Private Equity-Backed Buyouts[15]

Abstract

We extend experiential learning theory by arguing that the degree of causal ambiguity in firm decisions likely differs not only across different settings (i.e. operational vs. strategic), but also across different stages of the same strategic decision. With particular regard to acquisitions, we argue that the selection stage is less causally ambiguous than is the restructuring stage. Since experience translates into learning to a lesser extent when causal ambiguity is greater, acquisition experience translates more readily into learning to select than into learning to add value. Accordingly, we hypothesize that more experienced acquirers should perform better in scenarios when the focal acquisition is more selection (rather than restructuring) oriented, such as when (1) the educational background of the acquiring firm's top management is more finance- (rather than business-) oriented; and (2) the information environment is less transparent. Drawing on a unique database of 946 acquisitions realized by private equity firms in the U.S. between 1976 and 2005, we find results that are largely consistent with our notion that the correlation between acquisition experience and performance is more positive when the firm's capacity to select target companies is more relevant.

[15] Submitted for review as: Castellaneta, F, Conti, R, and Kemeny, C. *Learning to Do What? How Acquisition Experience Affects Learning to Select and Add Value in Private Equity-Backed Buyouts.*

Introduction

The goal of understanding how accumulated experience affects performance has taken center stage in the discourse between organizational and strategy scholars. Considerable research in operational settings has offered robust evidence of a positive impact of experience on performance (Argote and Epple, 1990; Dutton and Thomas, 1984; Yelle, 1979), but vast literature in strategic contexts—such as mergers and acquisitions (M&As), which account for most research conducted in this field—has provided decidedly mixed results (e.g., Barkema and Schijven, 2008a; Laamanen and Keil, 2008). To explain this inconsistency, it has been argued that learning from experience in strategic contexts is far more difficult than in operational settings, due to the higher level of causal ambiguity characterizing decisions in the context of the former than in the latter (March and Olsen, 1975; Zollo, 2009). That is, it is more difficult to determine precisely the causal relationships between decisions and their outcomes in strategic contexts based solely on accumulated experience about those decisions (Mosakowski, 1997).

In this paper, we extend experiential learning theory by arguing that the degree of causal ambiguity is likely to differ not only between decisions in different settings (i.e., operational vs. strategic), but also across different stages of the same strategic decision (such as, for instance, an acquisition). Therefore, the translation of experience into learning may vary substantially across such stages. In fact, with particular regard to acquisitions, we might identify two distinct stages, both of which contribute to determining final performance. On the one hand, at the selection stage, the acquirer tries to reduce the information asymmetry gap between itself and a potential target firm, in order to assess the latter's real value (Capron and Shen, 2007; Puranam, Powell, and Singh, 2006). On the other hand, at the restructuring stage, the acquirer tries instead to increase the target's actual value through corporate reorganization (Barkema and Schijven, 2008a; Heimeriks,

Schijven, and Gates, 2012).

We argue that the restructuring stage is more causally ambiguous than the selection stage, for (at least) two reasons. First, it is relatively more complex because it is composed of a *higher* number of *more* interrelated activities (King, 2007). Second, in comparison with the selection stage, the outcome of the restructuring stage tends to be more delayed (King, 2007). When organizations face causal ambiguity problems, experience translates into learning to a lesser extent (March and Olsen, 1975). Thus, acquisition experience should translate more into learning about how best to select targets than about how to restructure. If so, we should observe that more experienced acquirers perform particularly well when acquisition performance depends more heavily on the proper execution of the selection stage rather than of the restructuring one.

We apply our conceptual arguments to a context that is particularly well suited to discriminating between value created in these two stages: acquisitions—also called buyouts—performed by financial acquirers such as private equity (PE) firms (Kaplan and Schoar, 2005). Such firms can generate value by selecting targets with high potential for financial arbitrage, that is, those targets priced below their current standalone value (i.e., deploying a buy low, sell high strategy). Or they can create value once the target company has been acquired, by increasing the target's operational effectiveness (e.g., by cutting costs and improving margins) or its strategic distinctiveness (e.g., through redefining key strategic variables).

Against this background, we hypothesize that, since acquisition experience translates more into learning to select than to restructure, more experienced PE firms should perform better in any situation where the proper execution of the selection stage is more important than that of the subsequent restructuring state—i.e., when the focal acquisition is more selection (as opposed to restructuring) oriented. In fact, whereas all acquisitions are likely to be constituted of both a

selection and a restructuring phase, the relative importance of those two phases for the overall value created throughout the acquisition process likely differs across different deals. Thus, any acquisition is selection- or restructuring-oriented, according to whether selection or restructuring is the more important source of value creation. The extent to which an acquisition is selection- (as opposed to restructuring-) oriented is likely determined by: a) the internal human resources the PE firm is provided with and b) the external environment where it operates.

As for the corporate resources, we focus on firm level human capital and, in particular, on the type of educational background possessed by the acquiring firm's top management. A firm's acquisition strategy is influenced by top managers' cognitive bases and skills, which are in turn affected by the type of education that top managers have received (Hambrick and Mason, 1984; Hitt and Tyler, 1991; Hitt *et al.*, 2001a). In this respect, we argue that top managers with a finance education background are more likely to pursue selection-oriented acquisition (Andrews and Welbourne, 2000; Daellenbach, McCarthy, and Schoenecker, 1999), on which therefore the positive impact of acquisition experience is more salient. In contrast, top managers with a general business education background are more likely to pursue restructuring-oriented acquisitions (Daellenbach *et al.*, 1999; Hay and Hodgkinson, 2008; Sturges, Simpson, and Altman, 2003), on which the positive impact of experience is less relevant.

As for the external environment, based on the strategic factor market literature (Barney, 1986), we focus on the extent to which the acquiring firms face a transparent environment where the information about target firms is homogenous and available to all potential acquirers. The more transparent the information environment is, the lower the possibility of creating value by selecting target firms which are erroneously undervalued by other potential acquirers—that is, the lower the possibility of any acquisition being selection-oriented (Capron and Shen, 2007). Hence, experience

is less crucial for the performance of acquisitions realized in more transparent information environments.

Drawing on a unique database of 946 buyouts realized in the United States between 1976 and 2005, we find results largely consistent with the notion that acquisition experience enhances performance when the acquirer's capacity to select target companies is more relevant. Accordingly, our study makes several contributions. First, we advance previous experiential learning literature by arguing that the degree of causal ambiguity not only varies across different decisions—i.e., operational vs. strategic (Mosakowski, 1997; Zollo, 2009)—but also across different stages of the same decision—i.e., selection vs. restructuring. Second, we uncover the mechanisms through which experience can create value in acquisitions (Haleblian *et al.*, 2009), arguing that acquisition experience mainly translates into learning to select, and hence enhances acquisition performance in contingencies where selection is relatively more important than restructuring. Finally, our results may also contribute to solving the empirical puzzle of the role of experience in acquisitions (Barkema and Schijven, 2008b). More specifically, our findings suggest that acquisition experience can have a positive impact on acquisition performance in settings where selection is more important than restructuring, and no impact (or even a negative impact) in settings where instead restructuring is more important than selection.

Background

The issue of whether experience affects performance has been on the organizational research agenda for decades. Previous studies have consistently theorized and shown that performance increases as organizations gain production experience in operational settings, findings which have been documented, for example, in the production of aircraft (Alchian, 1963; Benkard, 2000;

Wright, 1936), ships (Rapping, 1965), trucks (Argote and Epple, 1990), and semiconductors (Hatch and Mowery, 1998).

However, the literature's findings on learning from experience in strategic contexts are decidedly mixed (Barkema and Schijven, 2008b). Some studies about alliances have shown positive relationships between alliance experience and performance (Anand and Khanna, 2000), while others find inverted U-shaped relationships (Deeds and Hill, 1996; Hoang and Rothaermel, 2005). Similarly, in the acquisitions literature—which is the focus of this paper—some studies have found positive relationships between acquisition experience and performance (Barkema, Bell, and Pennings, 1996; Bruton, Oviatt, and White, 1994; Fowler and Schmidt, 1989), but other contributions have reported non-significant (Hayward, 2002; Kroll *et al.*, 1997; Newbould, Stray, and Wilson, 1976; Wright *et al.*, 2002; Zollo and Singh, 2004) or U-shaped relationships (Haleblian and Finkelstein, 1999; Porrini, 2004).

To explain the different impacts of experience on performance in strategic versus operational contexts, previous research has suggested that experiential learning from strategic decisions (and, in particular, from acquisitions) is far more difficult than learning from operational tasks, due to the different levels of causal ambiguity characterizing these two settings. Causal ambiguity refers to the difficulty of determining precisely the causal relationships between a decision and its outcomes (Mosakowski, 1997). As the previous literature shows—assuming decision makers' bounded rationality (Simon, 1947)—causal ambiguity depends mainly on two characteristics of the decision at hand.

First, the cause-effect linkages between a decision and its outcomes can be obscured by the complexity of the decision itself—that is, by the numbers of activities involved in the decision and the degree of their interdependence (Zollo and Winter, 2002). These two factors are in fact the key

parameters of complexity as defined in the 'NK' models (Gavetti and Levinthal, 2000). An increase in either the number of activities or their interdependence naturally increases uncertainty about which specific activities determine final outcomes, and so harms experiential learning. In turn, the degree of interdependence likely depends on the type of relationship among the activities involved in the decision. As Puranam and Goetting (2011) point out, building on Thompson's (1967) classic typology, interdependence is null when each activity contributes independently to overall performance; it is medium when activities are sequential such that the output of one activity constitutes the input of the other activity; and it is highest when activities are reciprocal such that the input of one activity constitutes the output of the other activity and vice versa.

Second, the length of time needed before the outcome of a decision or action can be observed also increases the level of causal ambiguity: that is, "a long time interval between a competency execution and its outcome limits opportunities for performance assessment. In addition, longer time gaps may raise decision makers' propensity to engage in self-serving attributions that can distort more accurate assessments of competency-performance relationships" (King, 2007: 170).

We suggest that the degree of causal ambiguity likely differs not only across settings (i.e. operational vs. strategic), but also across different stages of the same strategic decision. As noted above, acquisitions entail two different stages: selection and restructuring. The selection stage mainly consists of engaging in a systematic search and collection of information about a range of potential targets, elaborating such information in order to decide which target to pursue, and bidding a convenient offer (Makadok and Barney, 2001; Puranam *et al.*, 2006). The value created through selection stage is therefore extrinsic to the acquired firm, as it is not determined by any change in that firm's underlying business. Rather, it is derived from acquirer firms' superior (i.e.,

more precise) assessments about potential target companies' values and the ensuing bidding for targets whose current standalone value is erroneously underestimated by other players (Capron and Shen, 2007; Reuer and Ragozzino, 2008).

In contrast, the restructuring stage consists of unlocking the potential value of the target through careful management of the post-acquisition process. An acquiring firm can create value in this stage by creating synergies (when the target is integrated) and/or improving the standalone value of the acquired firm (when it is not integrated). In the first case, synergies between acquirer and target can be realized in different areas, such as production, R&D, administration, and human resource management (Chatterjee *et al.*, 1992; Datta, 1991; Hitt, Harrison, and Ireland, 2001b; Larsson and Finkelstein, 1999). In the latter, the target's standalone value can be increased by improving its operational effectiveness—e.g., implementing cost cutting programs or replacing inefficient management teams—and/or by increasing its strategic distinctiveness—e.g., redefining some key strategic variable such as which markets it serves (Wright *et al.*, 2001b; Wright, Hoskisson, and Busenitz, 2001a). The value created through the restructuring stage is therefore intrinsic to the acquired company, in that it involves a fundamental transformation of the underlying business.

We argue that, compared to the selection stage, the restructuring stage is more causally ambiguous because it is a) more complex—in that composed by a higher number of more interdependent activities; and b) requires a longer time span before its outcomes can be observed. As far as complexity is concerned, both Haspeslagh and Jemison (1991) and Cording, Christmann, and King (2008) point out that organizational transformation in the post-acquisition phase is usually composed of many activities, "from the conversion of the information system, to the integration of supply and distribution chain, from the selection, retention and motivation of human

resources to the restructuring and reorganization of the new product development" (Zollo, 2000: 206), which are simultaneously executed and mutually dependent on each other. For instance no matter how well communication with the key customers of the acquired company has been handled, all will go to waste if its sale people are not retained and effectively motivated (and vice versa) (Haspeslagh and Jemison, 1991). The reciprocal interdependency among the large number of typical activities of the post-acquisition phase makes the entire process exceptionally complex (Haspeslagh and Jemison, 1991). The resulting confusion and lack of clarity makes it quite difficult for a newly combined entity to isolate the performance effects of these different activities (Cording *et al.*, 2008).

By contrast, the selection phase consists of a quite limited and well defined set of activities (mainly target search, evaluation and bidding), which makes the overall process not only easier to execute than the restructuring stage (Barkema and Schijven, 2008a), but probably also more simple to evaluate ex post. Furthermore, activities in the selection phases are executed sequentially: target search naturally precedes the evaluation (i.e., the due diligence) of the selected target(s), which in turn precedes the final bidding (Galpin and Herndon, 2010). Due to the sequential nature of this stage, it is relatively simple to decompose the overall process, in order to assess the performance contribution of each activity.

Finally, the time span between the execution of restructuring stages and the realization of their outcomes is typically quite long. Any short-term indicators of the restructuring phase performance might be in fact a poor (or even bad) predictor of the overall value created through restructuring in the long term. For example a cost-cutting program might be beneficial in the short term, but can generate (unexpected) negative long-term implications on the retention of top employees (Zollo and Meier, 2008). Hence, it could take at least three years to observe the *actual*

economic impact of changes implemented in the target company's business (Cording *et al.*, 2008). On the contrary, the feedback of the value selection stage is much more immediate. Once the target has been acquired, the information asymmetry between it and the acquirer is probably resolved rather quickly, and the acquirer can realize the extent to which its ex ante assessment of the target was accurate and whether the price paid reflects the current value of the firm net of any restructuring (Puranam *et al.*, 2006).

Since experience translates into learning more effectively when the action or decision at hand is not causally ambiguous (March and Olsen, 1975; Zollo, 2009), past acquisition experience is more likely to teach firms how to select undervalued targets ex ante, rather than how to restructure firms ex post. Hence, acquisition experience—whose direct effect on performance cannot be anticipated based on extant literature, and so is an empirical matter—should have a more positive effect on acquisition performance in any scenario where creating value depends more heavily on the proper implementation of the selection stage than that of the subsequent restructuring stage—that is to say, in selection-oriented (as opposed to restructuring-oriented) acquisitions.[16] Based on the previous reasoning, we formulate a general proposition, which will guide us in the hypotheses development:

> *Proposition: The correlation between a firm's acquisition experience and acquisition performance becomes more positive in any contingency which makes the focal acquisition more selection- (as opposed to restructuring-) oriented.*

[16] Saying that acquisition experience has a more positive impact on buyout performance when selection is more (less) important than restructuring implies that: if the direct effect of acquisition experience on performance is positive, is becomes more (less) positive; if the direct effect is negative, it becomes less (more) negative.

The empirical context: acquisitions by private equity firms

For this study, we chose to focus on acquisitions performed by PE firms—often called buyouts—which take the form of the purchase of a controlling-stake in a company (or a division) from its owners, usually with a limited time horizon (Gilligan and Wright, 2012; Pe'er and Gottschalg, 2011; Wruck, 2008). The major difference between a strategic acquisition and a buyout is that, while the former is often aimed at complementing an existing company through the creation of synergies, the latter is typically aimed at running the acquired business independently, and then selling it at a profit (Landau and Bock, 2013). However, this does not imply that the restructuring phase is less complex or important for PE firms rather than for strategic acquirers, as also PE firms tend to intervene substantially on improving the operations of the acquired companies in the post-acquisition phase (Acharya *et al.*, 2013).

The reasons for choosing the PE industry as empirical context are twofold. First, companies acquired during buyouts tend to only remain in the private equity firm's portfolio for a limited period, and to be handled completely independently from one another: they generally remain separate legal and financial entities, operating as stand-alone firms with no cross-subsidies or forced inter-firm sales (Landau and Bock, 2013). This makes it possible to measure the performance of each single acquisition independently from the performance of other companies in the portfolio—in other words, without confounding factors.

Second, the PE context is particularly well suited to discriminating the impact of experience on selection from that on restructuring. On the one hand, PE firms may be good 'scouts' that create value by selecting currently undervalued companies (Chan, 1983; Shepherd, Ettenson, and Crouch, 2000); on the other, they may be particularly good 'coaches' that make profits from ensuring that the firms in which they invest are well managed (Hellmann and Puri, 2002; Jain and Kini, 1995),

so that they gain value (Wright *et al.*, 2001a, 2001b).

We therefore apply our main theoretical argument—i.e., that acquisition experience (i.e., the number of buyouts bought and already sold) mainly translates into learning to select, as opposed to learning to add value—in the context of acquisitions performed by PE firms. If our argument is true, we should observe that acquisition experience has a more (less) positive impact on buyout performance where the focal buyout is more selection- (restructuring-) oriented.

Whether the focal acquisition or buyout is selection- or restructuring-oriented is likely determined by: a) the internal human resources that a PE firm is provided with at the time of the acquisition and b) the external environment that a PE faces when acquiring the focal target. As for corporate resources, we focus on the educational background of PE firm's top management team, which in fact "represents a unique organizational resource" (Hitt *et al.*, 2001a: 13) and contributes shaping firm strategy and performance (Hambrick and Mason, 1984; Hitt and Tyler, 1991). As for the external environment, based on the strategic factor market literature (Barney, 1986), we focus on the extent to which the information environment faced by the acquiring firm is transparent—i.e., the information about target firms is homogenous and available to all potential acquirers.

Theory and hypotheses

The type of educational background possessed by the acquiring firm's top management

The first contingency affecting whether an acquisition is selection or restructuring oriented is the *type* of educational background possessed by the acquiring firm's top management at the time of the focal acquisition. Top management has long been considered as a critical resource for firms (Carpenter, Geletkanycz, and Sanders, 2004; Hambrick and Mason, 1984; Hitt *et al.*, 2001a) because it comprises the most influential executives in an organization who have influence over

strategic choices and outcomes (Finkelstein, Hambrick, and Cannella, 2009a). Based on this understanding, a well-established stream of literature has explored how the characteristics of top management might affect firm's strategies and performance (Carpenter and Weikel, 2011; Finkelstein, Whitehead, and Campbell, 2009b).

In particular, it has been suggested that the education of top managers might play a particularly important role (Hambrick and Mason, 1984; Hitt and Tyler, 1991; Hitt *et al.*, 2001a). The reason is that education provides a repertoire of cognitive models and competences, which both naturally influence the way executives perceive and solve problems. In this regard, the *type* of education is crucial: in fact "we might expect those with formal education in engineering to utilize different cognitive models in making decisions than those with formal education in liberal arts or business" (Hitt and Tyler, 1991: 333). In fact, it has been shown that managers with postgraduate degree in technical and scientific fields tend to spend more resources in R&D compared to managers with other backgrounds (Barker III and Mueller, 2002). At the same time, CEOs with a finance education possibly believe that motivating employees is not a crucial factor for firm competitive advantage. Hence, they are less likely to spend resources for building a suitable job environment (Andrews and Welbourne, 2000).

Based on the previous evidence, we advance that the type of education might influence firm "acquisition style" and so make the focal acquisition more or less selection oriented. In particular, a finance education possibly leads top managers to create value by selecting rather than by restructuring. On the one hand, top managers with a finance educational background often display a financial conception of firms as "a collection of assets earning varying rate of returns" (Fligstein, 1990: 238-239). Such a cognitive framework naturally "leads management to focus on the market instead of internal operations" (Andrews and Welbourne, 2000: 95). In an acquisition

context, this implies that top managers focus more on evaluating the resources of a target company rather than improving them. On the other hand, a finance education provides a repertoire of 'hard' skills specifically focused on asset evaluation (Andrews and Welbourne, 2000), which are particularly useful for the quantitative and objective assessment of a target firm's assets.

By contrast, we might argue that a graduate level business education induces top managers to create value by restructuring rather than by selecting undervalued targets. First, a business education usually offers knowledge from diverse fields (e.g., management, economics, sociology, psychology, etc.). Such a broad perspective not only makes executives prone to adopt alternative ways of thinking and doing, but it also "may be seen to facilitate the managers in taking the position of others" (Hay and Hodgkinson, 2008: 29). This cognitive flexibility is particularly useful for managing situations of change, such as those implied by restructuring a company (Haspeslagh and Jemison, 1991). Second, a business education provides a broad understanding of different firm functions, like R&D, operations, human resources, strategy, marketing and sales (Sturges *et al.*, 2003). Therefore, executives with a business education are possibly able to understand and manage the complex interdependencies characterizing the activities of the restructuring phase.

Overall, we therefore expect that the acquisition will become more selection (restructuring) oriented when the proportion of the acquiring firm's top management with an education in finance (business) increases. Such reasoning naturally holds true also for the top management of PE firms, which usually might choose between pursuing hands-off selection oriented buyouts (Makadok and Barney, 2001; Puranam *et al.*, 2006) rather than hands-on restructuring oriented buyouts (Larsson and Finkelstein, 1999; Wright *et al.*, 2001a, 2001b). When the proportion of top management with an education in finance is higher, any buyout pursued by that PE firm will more likely be selection-oriented—such that experience will play a more positive role. In contrast, when the educational

background of top management is more business-oriented, the buyout will more likely be restructuring-oriented—such that the positive impact of experience on performance will be weaker. Accordingly, we formulate the following hypotheses:

Hypothesis 1: The correlation between a PE firm's acquisition experience and buyout performance becomes more positive when the proportion of top management with an education in finance is higher.

Hypothesis 2: The correlation between a PE firm's acquisition experience and buyout performance becomes less positive when the proportion of top management with an education in business is higher.

The transparency of the information environment

The second contingency we take into account is the transparency of the information environment in which target companies operate—that is, the extent to which information about potential targets is publicly available to all buyers, as opposed to being private. If, as we argue, acquisition experience mainly generates learning about how to select targets undervalued by other acquirers, then its positive effect on deal performance should be weaker in environments where information about target companies is mainly public and thus easily available. In such a scenario, all potential acquirers would have similar (and unbiased) assessments about a target's current value. Hence, there is no possibility of acquiring undervalued targets and so the only way to create value is given by the superior ability to restructure ex post the target company. In other words, the transparency of the information environment naturally makes acquisitions less selection oriented (that is equivalent to say more restructuring oriented).

In a sense, markets for acquiring corporate control of firms function in the same way as

other markets for strategic resources—so called "strategic factor markets" (Barney, 1986)—where one crucial route to superior economic performance is having more accurate expectations about a resource's future value than other players. Firms who can assess such future value more accurately can avoid economic losses due to overestimation and will also be better able to exploit valuable resources that are underestimated by other companies (Barney, 1986; Denrell, Fang, and Winter, 2003; Dierickx and Cool, 1989; Makadok and Barney, 2001). However, this informational advantage can only arise and be sustained in environments where information is unevenly distributed across firms—that is, where information environments are less transparent. Otherwise, firms can rely on the same information and will estimate resources similarly. Therefore, the competition for acquiring them would drive economic profits down towards zero (Barney, 1986).

To understand how information transparency makes acquisitions less selection oriented and thus penalizes experienced acquirers—provided with a superior ability to select, according to our theory—consider the following example. There is one target and two potential acquirers: one experienced and the other inexperienced. In a first scenario, the information environment is not transparent at all such that the information is unevenly distributed among them. In particular, the experienced acquirer, better in executing during the selection stage, has more reliable private information on the target and knows its current standalone value. The inexperienced acquirer instead has lower quality private information and so underestimates the value of the target. In such a situation, the experienced acquirer will be able to make profits simply by buying the undervalued target for a price inferior to its current value.

Consider now a second scenario where, before bidding, all information about the target becomes public: since acquirers are provided with the same information about the value of the target firm, bidding competition among them would naturally drive the price of the firm up to its

current standalone value (Capron and Shen, 2007), such that the value created through selection will be zero. This scenario clearly penalizes the experienced acquirer, who, without any increase in informational transparency, would have been able to earn abnormal returns just by leveraging the informational advantage.

The previous reasoning holds true for any context where more acquirers compete for the same targets, and so it is obviously true in the PE context, too. In principle, experienced PE firms enjoy informational advantages over less experienced PE firms in that they have probably learned to collect information about potential targets more effectively over time. But, if the information environment becomes more transparent—for instance, if some regulatory change obliges or incentivizes potential target companies to disclose more or better quality information about their assets (Armstrong *et al.*, 2012)—the fraction of value that can be created through selection naturally decreases. Therefore, the advantage enjoyed by more experienced PE firms at the selection stage would also decrease. Based on this understanding, we can formulate the following hypothesis:

> *Hypothesis 3: The correlation between a PE firm's acquisition experience and the focal buyout performance becomes less positive as information environments, at the time of the focal acquisition, become more transparent, i.e., where greater amounts of information about potential target companies become publicly available.*

Research Design

Research setting and data

We rely on a dataset of 946 PE buyouts of U.S. target firms realized by 51 PE firms between 1976 and 2005. To construct this dataset, we started from a database of 4,450 buyouts realized by 167

private equity firms in the U.S. between 1973 and 2008. We assembled these data by collecting PE firms' fund-raising prospectuses—usually referred as Private Placement Memoranda (PPM)—which contain performance indicators and some other characteristics of their prior buyouts. Of the 4,450 initial buyouts of U.S. target firms, we retained only those for which we were able to identify the state where the target firm was incorporated. In order to measure the transparency of the target companies' information environments, we needed to be aware of longitudinal changes in local (at the state level) anti-takeover regulations, which have an important impact on the amount and quality of information disclosed by public companies (Armstrong *et al.*, 2012). We also excluded from our analysis any PE firm for which we could not discover key pieces of information (e.g., industry, buyout year, performance). Moreover, we excluded from our analysis any PE firm for which we could not have complete information about their top management team members. This information was collected through different sources: *curriculum vitae* (CVs) contained in the PPMs or other documents provided to investors (e.g., the due diligence packs provided to investors in PE firms), the Galante Private Equity Directories from 1996 (hence covering year 1995) to 2006, and PE firms' websites.

Unlike commercially available data on such firms, which only provides performance measures at the fund level, our dataset enables us to measure the performance of each individual buyout, independent of the performance of other buyouts in the PE firm's portfolio. Moreover, our dataset contains the complete track record of each firm's past buyouts, which eliminates the problem of self-reported biases that arise in survey-based samples of privately held companies (Fitza, Matusik, and Mosakowski, 2009).

Variables

Dependent variable

Gross internal rate of return (IRR). To measure the performance of each buyout, we used the gross IRR, calculated as the annually compounded discount rate that would make the net present value (NPV) of all cash flows c_n related to a given buyout equal to 0[17]—that is:

$$\mathrm{NPV} = \sum_{n=0}^{N} \frac{c_n}{(1 + \mathrm{IRR})^n} = 0$$

The gross IRR is calculated using monthly gross cash inflows (i.e., capital calls from the investor in the PE fund) and outflows (i.e., capital distributions to the investor in the PE fund) for each investment. Similarly to previous studies (e.g., Castellaneta and Zollo, forthcoming; Lopez-de-Silanes, Phalippou, and Gottschalg, forthcoming), we compute the gross IRR, that is, the IRR gross of expenses, fees, carried interests, and management fees.

The most intuitive way to understand the meaning of the IRR is to think of it as the equivalent constant interest rate during the life of the investment "at which a given series of capital drawdowns must be invested in order for the private equity investor to earn a given series of cash distributions as income" (Talmor and Vasvari, 2011: 43). The IRR is a commonly used measure of performance in the PE industry because it takes into account the timing of cash flows realized at different points in time during the investment life.

Independent variables.

Acquisition experience. The PE firm's stock of acquisition experience is measured as the number

[17] Following previous studies on buyout performance (e.g., Lopez-de-Silanes *et al*., forthcoming), we censored observations above the 99th percentile, for which IRR is greater than 20. Retaining them produced similar results.

of the PE firm's buyouts completed before the focal target firm was acquired (Reagans, Argote, and Brooks, 2005). Thus, this measure only takes into account those deals where the PE firm completed the entire buyout process, from the initial acquisition up to the point when the acquired company was resold, so that it could learn by observing the outcome of the full buyout-resale process.

Finance education background. This variable measures the percentage of a PE firm's top managers who, at the time of the focal acquisition, had previously completed the Chartered Financial Analyst (CFA) program. The CFA is a professional credential offered by the CFA Institute to investment and financial professionals. A candidate who successfully completes three exams over three years (and also meets the professional requirement of 48 months of work experience) is awarded the "CFA charter". Each exam of the CFA curriculum comprises different areas: ethics, quantitative methods, corporate finance, financial reporting and analysis, equity investments, fixed income, derivatives, alternative investments, portfolio management, and economics. The financial educational background required to successfully pass these exams provides the financial tools most needed for properly assessing a firm's assets, which are likely to be particularly useful for the acquisition selection phase.

Business education background. This variable measures the percentage of a PE firm's top managers who, at the time of the focal acquisition, had previously earned a Master of Business Administration (MBA) degree. An accredited MBA curriculum provides business-related knowledge from diverse fields (i.e., economics, sociology, psychology), by covering areas such as entrepreneurship, marketing, human resources, operations management, project management, strategy, organizational behavior, accounting, and corporate governance. The business education background acquired after completing an MBA degree provides the management tools most

needed in managing the complex restructuring phase.

Transparency of local information environment. A good proxy for a change in the transparency of the target firm's information environment is the enactment of business combination laws in those states in which they are incorporated. Such laws are meant to prevent potential acquirers from taking over a public company during a specified period of time without the explicit permission of the target's board (e.g., Bertrand and Mullainathan, 2003). However, as Armstrong *et al.* (2012) have shown, the enactment of these laws has a significant effect on the wider information environments in states where such laws have been passed, such that public firms supply higher quality information. This occurs because managers of public companies more protected from the threat of takeover could, in theory, become less concerned about the company's performance. To convince external investors that this is not the case, they provide them with better and more information.

Improvements in the accessibility of information about public companies in such states probably also leads to improvements in the information available about the value of *private* firms located in those states. Indeed, the usual way of estimating the value of a private company is by comparing it to the values of 'comparables', that is, similar public companies affected by the same local environmental conditions (Bowman and Bush, 2006). Hence, the availability of better financial data about the 'comparables' provides the basis for more reliable and less biased estimates of the value of private companies in the same state. Accordingly, we expect that the enactment of anti-takeover laws has made the information environment more transparent for companies (public and private) based in states where such laws have been passed. Appendix 3.A1 lists the years in which states from the U.S. have passed anti-takeover regulation.

A key issue is whether the enactment of anti-takeover legislation constitutes an exogenous

event with respect to PE firms. Extant literature suggests that the passage of such laws should be uncorrelated with PE firm characteristics, so that they offer an ideal context for a quasi-natural experiment. For example, Romano (1987) analyzes the political context that characterized the passage of anti-takeover laws in various states and concludes that they are nearly always promoted by specific companies—those under threat of takeover—rather than being the result of organized efforts by firms in general (including PE firms). Thus, for most companies, their enactment appears to be an exogenous event.

Control variables

From a systematic review of prior empirical studies on PE firms (Barber and Goold, 2007; Kaplan and Schoar, 2005; Kaplan and Strömberg, 2009; Kreuter, Gottschalg, and Zollo, 2005; Phalippou and Gottschalg, 2009) and corporate acquisitions (Kim and Finkelstein, 2009), we derived a set of control variables to rule out potentially confounding factors with our independent variables.

The first set of controls accounts for the educational background and work experience of top management at PE firms. *Ivy League education background* controls for the percentage of managers who have earned a degree (baccalaureate, masters, or professional) granted by an Ivy League university. *Consulting work experience, entrepreneurship work experience* and *legal work experience* represent the percentage of managers with past work experience, respectively, as a consultant, entrepreneur and lawyer.

The second group of control relates to two characteristics of PE firm acquisition (Wright, Gilligan, and Amess, 2009). Larger and older PE firms are likely to not only have more acquisition experience, but also more resources and managerial skills and higher reputations, which can help them execute buyouts more successfully (Folta and Janney, 2004). We therefore include *PE fund size*, measured as the total equity raised by the fund that acquired a focal company (Laamanen and

Keil, 2008), and *PE firm age*, measured as the number of years between its foundation and the entry year of the focal buyout (Seppä and Laamanen, 2001). Finally, we included *PE firm fixed effects* to control for any time-invariant, unobservable PE firm characteristics.

The third set of controls accounts for the various characteristics of the focal buyout: *buyout size*, measured as the total equity paid for the buyout (expressed in millions of 2006 USD); *duration* of the focal investment, measured as the length of time (in years) between the start of the buyout to the completion of the resale—if a PE firm bought a company in 2000 and resold it in 2002, the duration equals 2; *IPO* takes the value of 1 when the investment is exited through an IPO; *entry year fixed effects*. Finally, we included the *target firm's state* and *industry fixed effects* to control for unobserved state and industry heterogeneity, respectively.

Empirical strategy

Our analysis refers to the single buyout level. To test hypothesis 1, we use an ordinary least squares (OLS) model, in which the dependent variable is the performance of the buyout of a certain target company *i* by a private equity firm *j*. That is:

$$IRR_{i,j} = \alpha * Experience_{j,tbuy} + \beta * Finance\_education\_background_{j,tbuy} + \gamma * Experience_{j,tbuy} * Finance\_education\_background_{j,tbuy} + \delta Z + e_{i,j}, \quad (3.1)$$

The $Experience_{j,tbuy}$ variable measures the number of acquisitions already resold by the PE firm *j* before the year in which the focal company *i* is bought; $Finance\_education\_background_{j,tbuy}$ is the percentage of top managers with a finance background at the time the focal company *i* is acquired by the PE firm; *Z* is a vector of the control variables listed and described in the previous section; $e_{i,j}$ is the stochastic error, which we clustered at the PE firm level. Consistent with hypothesis 1, we expect γ to be positive and significant.

To test hypothesis 2, we estimate the following equation:

$$IRR_{i,j} = \alpha * Experience_{j,tbuy} + \beta * Business\_education\_background_{j,tbuy} + \gamma * Experience_{j,tbuy} * Business\_education\_background_{j,tbuy} + \delta Z + e_{i,j}, \quad (3.2)$$

$Business\_education\_background_{j,tbuy}$ is the percentage of top managers with a business background at the time of the focal *i* is acquired. Consistent with hypothesis 2, we expect γ to be positive and significant.

To test hypothesis 3, we estimate the following equation:

$$IRR_{i,j} = \alpha * Experience_{j,tbuy} + \beta * Transparency\_info\_environment_{i} + \gamma * Experience_{j,tbuy} * Transparency\_info\_environment_{i} + \delta Z + e_{i,j}, \quad (3.3)$$

Transparency_info_environment$_i$ is a variable equal to 1 if the state where the target company *i* is incorporated has enacted anti-takeover business combination laws—such that its information environment is more transparent than those where such regulations have not been enacted—and 0 otherwise. Consistent with hypothesis 3, we expect γ to be negative and significant. Table 3.1 describes all variables used in the analysis.

Results

Tables 3.2 and 3.3 present the descriptive statistics and the pairwise correlations between variables respectively. Table 3.2 shows that the average performance of a buyout, as measured by its IRR, equals 0.44, which means that financial acquirers in our sample made average yearly profits of 44 percent from each buyout. The number of acquisitions made by PE firms in our sample (which equates to our acquisition experience measure) was, on average, approximately 18. Interestingly, the correlation between IRR and experience was positive and not significant: but more robust findings about the relationships between experience and performance could only be obtained in a

Table 3.1 Operationalization of variables

Variable	Operationalization
IRR	The internal rate of return of the private equity firm buyout into the target company. Source: proprietary database.
Acquisition experience	The number of buyouts already realized by the private equity firm up to the focal buyout. Source: proprietary database.
Finance education background	Proportion of PE firm top managers with a CFA charter over the total number of PE firm top managers. Source: proprietary database.
Business education background	Number of PE firm top managers with a MBA degree over the total number of PE firm top managers. Source: proprietary database.
Transparency	Equal to 1 if the state where the target firm is incorporated did enact the anti-takeover regulation. Source: (Bertrand and Mullainathan, 2003)
Buyout duration	The difference between the year when the target company was bought by the private equity firm, and the year when it was sold. Source: proprietary database.
Buyout size	The overall amount of equity invested by the private equity firm, in 2006 USD. Source: proprietary database.
Fund size	The amount of money collected by the fund, in 2006 USD. Source: proprietary database.
Firm age	The number of years since the foundation of the PE firm with respect to the entry year of the focal buyout. Source: proprietary database.
Entry year dummies	Equal to 1 in the entry year of the focal buyout. Source: proprietary database.
Incorporation state dummies	Equal to 1 for the state of incorporation of the target company. Source: proprietary database.
Industry dummies	Equal to 1 for the industry where the target company operates. Source: proprietary database.
IPO dummy	Equal to 1 when the investment is exited through an IPO. Source: proprietary database.
Consulting work experience	Number of PE firm top managers with consulting experience over the total number of PE firm top managers. Source: proprietary database.
Entrepreneurship work experience	Number of PE firm top managers with entrepreneurship experience over the total number of PE firm top managers. Source: proprietary database.
Ivy League education background	Number of PE firm top managers with any educational degree from an Ivy League university over the total number of PE firm top managers. Source: proprietary database.
Legal work experience	Number of PE firm top managers with a law degree over the total number of PE firm top managers. Source: proprietary database.
Average finance education background	The average proportion of PE firm top managers with a CFA charter in all buyouts done in the same year, industry and state of the focal buyout. Source: proprietary database.
Average business education background	The average proportion of PE firm top managers with an MBA degree in all buyouts done in the same year, industry and state of the focal buyout. Source: proprietary database.

Table 3.2 Descriptive statistics

Variable	N	Mean	Std. Dev.	Min.	Max.
IRR	946	0.44	1.55	-1.00	16.30
Experience	946	18.38	22.48	0.00	151.00
Experience (10 years)	946	13.38	16.08	0.00	110.00
Experience (5%)	946	12.51	14.89	0.00	94.23
Experience (discount age)	946	10.12	11.82	0.00	73.48
Finance education background	946	0.13	0.16	0.00	1.00
Business education background	946	0.58	0.23	0.00	1.00
Transparency	946	0.54	0.50	0.00	1.00
Consulting work experience	946	0.33	0.30	0.00	1.00
Entrepreneurship work experience	946	0.30	0.22	0.00	1.00
Legal work experience	946	0.15	0.17	0.00	1.00
Ivy League education background	946	0.53	0.26	0.00	1.00
Duration	946	5.74	4.04	0.00	28.00
IPO	946	0.22	0.41	0.00	1.00
Buyout size	946	70.12	221.09	0.10	6,143.15
PE firm age	946	9.20	6.25	0.00	28.08
Fund size	946	928.78	1,291.19	5.00	6,450.00

multivariate framework, in which the effects of acquisition experience can be disentangled from other variables.

Table 3.4 presents the result of the OLS regressions used to estimate equations (3.1), (3.2) and (3.3). The standalone impact of experience is significant only in specifications (3) and (4). This finding is consistent with previous studies showing that the impact of experience, per se, is not significant (or is only slightly so) in strategic contexts, and suggests that “important

Table 3.3 Correlations

Variable	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.
1. IRR	1.00																
2. Experience	0.05	1.00															
3. Experience (10 years)	0.05	0.98***	1.00														
4. Experience (5%)	0.05	0.99***	0.99***	1.00													
5. Experience (discount age)	0.04	0.99***	0.99***	1.00***	1.00												
6. Finance education background	-0.01	0.08*	0.08*	0.08*	0.08*	1.00											
7. Business education background	0.06	0.10**	0.10**	0.10**	0.10**	-0.07*	1.00										
8. Transparency	-0.10**	0.19***	0.20***	0.20***	0.20***	0.00	0.03	1.00									
9. Consulting work experience	0.07*	0.19***	0.20***	0.19***	0.19***	0.48***	0.01	0.03	1.00								
10. Entrepreneurship work experience	-0.08*	-0.07*	-0.08*	-0.09**	-0.09**	0.09**	-0.04	-0.03	0.09**	1.00							
11. Legal work experience	-0.01	-0.22***	-0.21***	-0.21***	-0.21***	-0.17***	-0.28	-0.12***	-0.07*	-0.32***	1.00						
12. Ivy League education background	0.03	0.10**	0.11***	0.11***	0.12***	-0.33***	0.58***	0.04	-0.03	-0.15***	0.03	1.00					
13. Duration	-0.04	-0.14***	-0.14***	-0.14***	-0.14***	0.01	0.07*	-0.14***	0.02	-0.20***	0.21***	0.14***	1.00				
14. IPO	0.15***	-0.05	-0.05	-0.05	-0.05	0.02	0.08*	-0.02	-0.02	-0.09**	0.06	0.06	0.11***	1.00			
15. Buyout size	-0.04	0.11***	0.12***	0.12***	0.13***	-0.09**	-0.01	-0.00	-0.10**	-0.13***	0.07*	0.08*	0.11***	0.01	1.00		
16. PE firm age	-0.07*	0.71***	0.65***	0.69***	0.68***	0.05	-0.01	0.19***	0.11***	-0.03	-0.16***	0.05	-0.15***	-0.06	0.15***	1.00	
17. Fund size	-0.04	0.52***	0.49***	0.53***	0.53***	-0.15***	0.10**	0.09**	-0.15***	-0.22***	-0.09**	0.23***	-0.03	-0.01	0.36***	0.50***	1.00

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

contingencies are at play and, thus, researchers need to dig deeper" (Barkema and Schijven, 2008b: 595). In particular, according to our theory, the impact of acquisition experience on the performance of the focal deal should be more positive in any contingency where the performance outcome relies more heavily on the proper implementation of the selection rather than of the restructuring stage.

More specifically—as proposed in hypothesis 1—experience should have a more positive impact when the presence of top managers with an education in finance increases. Indeed, consistent with our theory, we find that the correlation between experience and performance becomes more positive as the proportion of executives with a CFA increases ($\beta = 0.084$, $p < 0.05$) (Table 3.4, column 2).

Another contingency considered was the presence of executives with graduate level education in business. Hypothesis 2 predicts that the correlation between experience and performance should be greater when the presence of top executive with a business educational background is higher. We find the coefficient of the interaction between experience and Business education background is negative and significant ($\beta = -0.046$, $p < 0.01$) (Table 3.4, column 3).

Hypothesis 3 proposes that the correlation between acquisition experience and IRR will be lower when the information environment improves, and indeed we find that the coefficient of the interaction between acquisition experience and information environment transparency is negative and significant ($\beta = -0.012$, $p < 0.05$) (Table 3.4, column 4). In particular, after the state enactment of business combination laws (the proxy we used to measure information environment improvements). Finally, we also check whether our results are robust to the inclusion of all three interactions in the same model. Results are similar to those found in the previous models (Table 3.4, Model 5).

Table 3.4 The impact of experience on IRR: OLS regression

Variable	(1) IRR	(2) IRR	(3) IRR	(4) IRR	(5) IRR
Experience	0.004	-0.012	0.033***	0.012*	0.019
	(0.006)	(0.009)	(0.013)	(0.007)	(0.015)
Finance education background (FEB)	-0.692	-1.101	-0.596	-0.581	-0.882
	(1.086)	(1.100)	(1.082)	(1.083)	(1.097)
Experience * FEB **(H1)**		0.084**			0.072*
		(0.038)			(0.039)
Business education background	1.695***	1.509***	1.796***	1.759***	1.663***
	(0.559)	(0.564)	(0.558)	(0.558)	(0.564)
Experience * BEB **(H2)**			-0.046***		-0.034*
			(0.017)		(0.018)
Transparency	-0.355	-0.388	-0.288	-0.102	-0.128
	(0.283)	(0.283)	(0.283)	(0.301)	(0.300)
Experience * Transparency **(H3)**				-0.012**	-0.010*
				(0.005)	(0.005)
Consulting work experience	1.460*	2.057**	1.379	1.328	1.805**
	(0.854)	(0.895)	(0.851)	(0.853)	(0.895)
Entrepreneurship work experience	-0.594	-0.833	-0.789	-0.636	-0.977
	(0.702)	(0.709)	(0.703)	(0.700)	(0.707)
Legal work experience	0.423	0.654	0.155	0.390	0.397
	(0.733)	(0.739)	(0.736)	(0.730)	(0.744)
Ivy League education background	-0.625	-1.126	-0.374	-0.555	-0.813
	(0.657)	(0.695)	(0.661)	(0.656)	(0.703)
Duration	-0.086***	-0.097***	-0.089***	-0.085***	-0.097***
	(0.022)	(0.023)	(0.022)	(0.022)	(0.023)
IPO	0.618***	0.622***	0.610***	0.612***	0.611***
	(0.130)	(0.130)	(0.130)	(0.130)	(0.129)
Buyout size	-0.001**	-0.001**	-0.001**	-0.001**	-0.001**
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
PE firm age	0.159	0.184	0.142	0.152	0.163
	(0.185)	(0.185)	(0.184)	(0.184)	(0.184)
Fund size	-0.000	-0.000	-0.000	-0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Constant	1.727	1.937	1.578	1.671	1.752
	(2.504)	(2.500)	(2.494)	(2.496)	(2.488)
Entry Year Dummies	Yes	Yes	Yes	Yes	Yes
Incorporation State Dummies	Yes	Yes	Yes	Yes	Yes
Industry Dummies	Yes	Yes	Yes	Yes	Yes
Observations	946	946	946	946	946
R-squared	0.285	0.290	0.292	0.291	0.298

Note. Robust standard errors in parentheses.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Robustness checks

We first run an analysis to check whether our results might be biased by some endogeneity issues. In particular, it could be argued that the finance or business education backgrounds of top managers are purposefully targeted by PE companies in order to increase acquisition performance, meaning that these factors are not exogenous. To tackle this issue, we therefore adopted an instrumental variable approach. In particular, we used the average of finance education background of all buyouts in the same year, state and industry as an instrument for finance education background. Similarly, we used the average of business education background of all the companies investing in the same year, state and industry as an instrument for business education background in the focal buyout. The assumption is that some idiosyncratic characteristics of the buyout year (e.g., the economic situation), of the industry (e.g., its maturity) or the local environment (for instance, the state's enactment of certain regulations) exogenously determines the PE firm's choices with regards to both the finance and business backgrounds of their top executives. Table 3.5 presents the results of the instrumental variable model, which are largely consistent with the findings presented in Table 3.4. In particular, the coefficient of the interaction between acquisition experience and finance education background remains positive and significant (β = 0.127, $p < 0.05$) (Table 3.5, Model 1), while the coefficient of interaction between experience and business education background is still negative and significant (β = -0.053, $p < 0.01$) (Table 3.5, Model 2).

Another concern involves the proxy we used for measuring the improvement in the information environment, i.e., the state enactment of business combination laws. Even if this event is exogenous, a criticism could be that business combination laws affect the acquisition process of *public* companies by changing the 'rules of the game' for acquiring such companies, rather than by improving the information environment directly. Hence, more experienced PE firms—those

Table 3.5 The impact of experience on IRR: Instrumental Variable regression

Variable	(1) IRR	(2) IRR	(3) IRR
Experience	-0.019*	0.038***	0.014
	(0.011)	(0.014)	(0.019)
Finance education background (IV-FEB)	-1.286	-0.928	-1.018
	(1.334)	(1.351)	(1.329)
Experience * IV-FEB **(H1)**	0.127**		0.116**
	(0.054)		(0.055)
Business education background (IV-BEB)	0.872	1.146*	0.949
	(0.695)	(0.681)	(0.692)
Experience * IV-BEB **(H2)**		-0.053***	-0.038*
		(0.020)	(0.021)
Transparency	-0.406	-0.284	-0.150
	(0.284)	(0.284)	(0.301)
Experience * Transparency **(H3)**			-0.010*
			(0.005)
Consulting work experience	2.255**	1.387	1.970**
	(0.928)	(0.921)	(0.930)
Entrepreneurship work experience	-1.156	-1.051	-1.350*
	(0.737)	(0.727)	(0.741)
Legal work experience	0.637	-0.051	0.334
	(0.751)	(0.753)	(0.771)
Ivy League education background	-1.276*	-0.300	-0.915
	(0.714)	(0.707)	(0.735)
Duration	-0.102***	-0.088***	-0.102***
	(0.024)	(0.022)	(0.024)
IPO	0.624***	0.607***	0.614***
	(0.130)	(0.130)	(0.130)
Buyout size	-0.002**	-0.001**	-0.001**
	(0.001)	(0.001)	(0.001)
PE firm age	2.300	1.918	2.137
	(2.512)	(2.505)	(2.500)
Fund size	-0.019*	0.038***	0.014
	(0.011)	(0.014)	(0.019)
Constant	-1.286	-0.928	-1.018
	(1.334)	(1.351)	(1.329)
Entry Year Dummies	Yes	Yes	Yes
Incorporation State Dummies	Yes	Yes	Yes
Industry Dummies	Yes	Yes	Yes
Observations	946	946	946
R-squared	0.288	0.290	0.296

Note. Robust standard errors in parentheses.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

that have developed abilities in dealing with the process of acquiring public companies before the regulatory change—suffer a greater loss than do less experienced companies after the shift in the regulatory environment, as their acquisition experience is probably not all re-deployable after the change. Even if this explanation could theoretically account for our results, we believe it is inappropriate for our sample, which is mainly (about 90%) composed of buyouts of *private* companies. Arguably, the only way business combination laws could affect the acquisition of private companies in our sample is by changing the overall local information environment, by inducing public companies (which are used as 'comparables' to assess the value of focal target private companies) to disclose more and higher quality information. However, to ensure our results are not due to the presence of public companies in our sample, we replicated the analysis including only private companies. The results (presented in Table 3.6) remain completely consistent with our theory.

Finally, previous studies have taken into account the possibility that experience depreciates over time (e.g., Ingram and Baum, 1997). In this respect, our descriptive statistics suggest that this is unlikely to happen in the PE context, where on average, PE firms only execute 18 buyouts over their entire life; the average number further decreases to 13 if we exclude the outliers in terms of experience above the 95th percentile. This suggests that buyouts are strategic rare events (Zollo, 2009) and therefore, are unlikely to depreciate over time (e.g., Argote, Beckman, and Epple, 1990; Haleblian and Finkelstein, 1999; Ingram and Baum, 1997). However, we analyze whether our results are robust to the use of discounting rates for experience. More specifically, based on previous literature (e.g., Haleblian and Finkelstein, 1999; Hayward, 2002; Vermeulen and Barkema, 2001), we use three different discounts of experience. First, we measure experience as

Table 3.6 The impact of experience on IRR: OLS regression (only private firms in the sample)

Variable	(1) IRR	(2) IRR	(3) IRR	(4) IRR
Experience	-0.011	0.039***	0.014*	0.024
	(0.010)	(0.014)	(0.008)	(0.017)
Finance education background (FEB)	-0.624	-0.072	-0.014	-0.421
	(1.210)	(1.187)	(1.189)	(1.205)
Experience * FEB **(H1)**	0.095**			0.083*
	(0.043)			(0.043)
Business education background (BEB)	1.509**	1.862***	1.802***	1.715***
	(0.615)	(0.609)	(0.608)	(0.616)
Experience * BEB **(H2)**		-0.051***		-0.040**
		(0.019)		(0.020)
Transparency	-0.434	-0.326	-0.139	-0.161
	(0.324)	(0.324)	(0.340)	(0.339)
Experience * Transparency **(H3)**			-0.013**	-0.012**
			(0.006)	(0.006)
Consulting work experience	1.746*	1.021	0.982	1.469
	(0.982)	(0.939)	(0.942)	(0.981)
Entrepreneurship work experience	-1.281*	-1.260	-1.064	-1.454*
	(0.776)	(0.771)	(0.767)	(0.775)
Legal work experience	0.575	0.082	0.321	0.333
	(0.825)	(0.822)	(0.817)	(0.828)
Ivy League education background	-0.835	-0.062	-0.213	-0.532
	(0.763)	(0.725)	(0.721)	(0.769)
Duration	-0.101***	-0.093***	-0.087***	-0.102***
	(0.025)	(0.025)	(0.025)	(0.025)
IPO	0.647***	0.629***	0.641***	0.631***
	(0.147)	(0.147)	(0.147)	(0.147)
Buyout size	-0.001*	-0.001	-0.001	-0.001
	(0.001)	(0.001)	(0.001)	(0.001)
PE firm age	0.254	0.198	0.208	0.234
	(0.206)	(0.205)	(0.205)	(0.205)
Fund size	-0.000	-0.000	-0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Constant	3.306	2.854	2.899	3.243
	(2.790)	(2.779)	(2.782)	(2.775)
Entry Year Dummies	Yes	Yes	Yes	Yes
Incorporation State Dummies	Yes	Yes	Yes	Yes
Industry Dummies	Yes	Yes	Yes	Yes
Observations	853	853	853	853
R-squared	0.312	0.315	0.313	0.322

Note. Robust standard errors in parentheses.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

the number of PE firm's buyouts completed in the last ten years. This variable is called *Experience (10 years)*. Second, we discount experience for a five percent discount rate. This implies, for instance, that buyouts exited at time *t*-1 are multiplied by a factor of 100% and buyouts exited at time *t*-2 are multiplied by a factor of 95%, and so on. This variable is called *Experience (5%)*. Third, we discount experience by the cube root of experience age. This variable is called *Experience (discount age)*. As shown in Table 3.7, our results are completely robust to the use of discounts for experience.

Conclusions

We found that, in the PE context, experience acquired from buyouts translates more into learning to select targets, rather than learning to add value, such that more experienced PE firms perform better when the educational background of top managers at the PE firm is more finance-oriented. Conversely, performance is worse when the educational background of top managers are more business-oriented and the information environment is more transparent. Accordingly, our study offers several key contributions to prior literature.

First, it suggests that the degree of causal ambiguity not only varies across decisions—i.e., operational vs. strategic—but, in strategic contexts, also across different stages of the same decision—i.e., selection vs. value addition. More specifically, we suggest that the likelihood of incurring causal ambiguity problems is higher during the value addition stage than in the selection stage. This finding might concern not only the acquisition context, but also other settings (such as alliances) where value is both created ex ante (e.g., by selecting the right alliance partner) and added ex post (by coordinating effectively with that partner).

Table 3.7 The impact of experience on IRR: Experience discounting

Variable	(1) IRR	(2) IRR	(3) IRR
Experience (10 years)	0.039*		
	(0.022)		
Experience (5%)		0.031	
		(0.023)	
Experience (discount age)			0.039
			(0.030)
Finance education background (FEB)	-0.781	-0.894	-0.895
	(1.107)	(1.102)	(1.103)
Experience (10 years) * FEB **(H1)**	0.104*		
	(0.057)		
Experience (5%) * FEB **(H1)**		0.105*	
		(0.060)	
Experience (discount age) * FEB **(H1)**			0.132*
			(0.076)
Business education background (BEB)	1.724***	1.693***	1.702***
	(0.566)	(0.566)	(0.568)
Experience (10 years) * BEB **(H2)**	-0.070***		
	(0.026)		
Experience (5%) * BEB **(H2)**		-0.059**	
		(0.027)	
Experience (discount age) * BEB **(H2)**			-0.074**
			(0.034)
Transparency	-0.134	-0.138	-0.138
	(0.301)	(0.301)	(0.303)
Experience (10 years) * Transparency **(H3)**	-0.012*		
	(0.007)		
Experience (5%) * Transparency **(H3)**		-0.014*	
		(0.008)	
Experience (discount age) * Transparency **(H3)**			-0.017*
			(0.010)
Consulting work experience	1.739*	1.813**	1.812**
	(0.898)	(0.898)	(0.898)
Entrepreneurship work experience	-0.888	-0.920	-0.911
	(0.702)	(0.705)	(0.706)
Legal work experience	0.326	0.391	0.402
	(0.745)	(0.744)	(0.743)
Ivy League education background	-0.730	-0.810	-0.813
	(0.710)	(0.706)	(0.706)
Duration	-0.099***	-0.098***	-0.098***
	(0.023)	(0.023)	(0.023)
IPO	0.615***	0.614***	0.613***
	(0.129)	(0.129)	(0.129)
Buyout size	-0.001**	-0.001**	-0.001**
	(0.001)	(0.001)	(0.001)
PE firm age	0.174	0.171	0.171
	(0.182)	(0.182)	(0.182)
Fund size	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)
Constant	1.751	1.777	1.766
	(2.477)	(2.480)	(2.480)
Entry Year Dummies	Yes	Yes	Yes
Incorporation State Dummies	Yes	Yes	Yes
Industry Dummies	Yes	Yes	Yes
Observations	946	946	946
R-squared	0.300	0.298	0.298

Note. Robust standard errors in parentheses.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Second—and related to the previous point—this paper contributes to the stream of literature on the influence of experience in the context of strategic decisions. Prior research has mainly addressed whether experience impacts decision performance (Barkema and Schijven, 2008b), but we still have limited insights about *how* (that is, via which mechanisms) this happens (Haleblian *et al.*, 2009). By disentangling selection and value addition stages, we offer new evidence on how experience actually creates value for firms engaging in acquisitions.

Third, our findings may also contribute to solving the empirical puzzle of the acquisition literature's mixed results on the role of experience (e.g., Barkema and Schijven, 2008b). A possible explanation of such mixed findings is that those studies showing positive correlations between experience and performance probably considered settings where the selection stage was more important than the value addition stage, while others—which report statistically not significant or even negative correlations—may have been conducted in contexts where the value addition stages were more relevant.

Fourth, we contribute to the debate on whether PE firms create value mainly in the selection or value addition stage, and extend this discussion—which has been focused on young startups (e.g., Baum and Silverman, 2004)—to the context of buyouts, that is, to study PE investments in mature businesses. This issue has received surprisingly scant attention in the literature, notwithstanding PE firms' importance in the strategic renewal of established businesses. By showing that experience accumulation impacts selection more strongly than value addition, we offer new evidence on the levers of value creation in PE firm buyouts.

Finally, by examining the impact of institutions on business activity, we contribute to illustrating how government policies influence PE firms' ability to generate profits (e.g., Pe'er and Gottschalg, 2011). The link between government regulation and business activity is of central

interest to practitioners, especially since government policies are more likely to affect companies' economic value than actions by any other group of stakeholders except customers (McKinsey Global Survey, 2010). In this respect, we provide evidence about the importance of regulations such as anti-takeover laws on the performance of PE firms.

Some limitations of this study are also worth noting. First, this paper has focused only on acquisitions realized by PE companies. In this regard, one might argue that the post-acquisition phase faced by a strategic acquirer, who usually integrates the acquired company into their business, is more complex than that faced by a financial acquirer, who usually runs the acquired business independently from other portfolio companies However, if so, our argument that experience translates more into learning to select than to restructure should hold a fortiori for strategic acquirers, such that we expect our findings also to hold for strategic acquirers. Furthermore, a vast body of empirical evidence suggests that PE firms are often involved in the radical restructuring of acquired companies (e.g., Acharya *et al.*, 2013), which is at least as complex as the restructuring pursued by strategic acquirers. Second, we limit our analysis to the influence of acquisition experience as measured solely by the number of past acquisitions. It would be interesting to take more nuanced measures of experience into account, such as experience homogeneity and pacing. Third, we have no direct measures for value addition and selection—future surveys could find ways to better estimate these two dimensions and build direct measures for them. Finally, we can only claim that acquisition experience is positively correlated with better performance in those situations where selection is more relevant than value addition—but not that it is experience only that causes such performance increases, as other unobserved variables may confound its impact. Future studies could cope with this causality issue, for example relying on experimental methods which could isolate the effect of experience on performance net of all the

other confounding variables.

Despite these limitations, we believe this study provides important insights for managers and policymakers. On the one hand, the issue of whether PE firms make profits either through selection or value addition—which has been debated recently (Kosman, 2009)—has important implications for policymakers. In this paper, we have shown that accumulated experience translates more into a capacity to select rather than to add value. Hence, policymakers might want to attract investment from experienced or inexperienced PE firms—for instance, by using different taxation rates or enacting laws to change the information environment—according to whether they want to promote the selection of the best firms or the general enhancement of the managerial capabilities of PE-backed companies.

Our study also has relevant implications for practitioners. More experienced PE firms are likely to have competitive advantages in contexts characterized by higher levels of information asymmetries—these PE firms should choose to operate in contexts, such as emerging markets, where they can probably leverage their superior capacity to select (Cumming, Schmidt, and Walz, 2004; La Porta *et al.*, 1997). Whether experienced PE firms can effectively achieve competitive advantages in such markets is an interesting topic we leave for future research.

Appendix

Table 3.A1 Anti-takeover laws passed by state

State	Year of enactment	State	Year of enactment
Arizona	1987	Nebraska	1988
Connecticut	1989	Nevada	1991
Delaware	1988	New Jersey	1986
Hawaii	–	New York	1985
Georgia	1988	North Carolina	–
Idaho	1988	Oklahoma	1991
Illinois	1989	Ohio	1990
Indiana	1986	Oregon	–
Kansas	1989	Pennsylvania	1989
Kentucky	1987	Rhode Island	1990
Louisiana	–	South Carolina	1988
Maine	1988	South Dakota	1990
Maryland	1989	Tennessee	1988
Massachusetts	1989	Utah	–
Michigan	1989	Virginia	1988
Minnesota	1987	Washington	1987
Mississippi	–	Wisconsin	1987
Missouri	1986	Wyoming	1989

Note. Source: Bertrand and Mullainathan, 2003.

4 Political Party Orientation and its Effect on VC Investment

Abstract

This study investigates how political party orientation and partisanship influences VC investment. In the United States, elected officials of the state and national executive branches are affiliated with two major representative parties: the Republican Party ("Red") and the Democratic Party ("Blue"). Using a dataset of VC deals realized from 1980 to 2013, we find that states that have elected a Republican governor generate more VC investment when also voting for a Democratic presidential candidate compared to a Republican candidate. We discuss policy mechanisms that can help explain these findings.

Introduction

Because of the potential impact that VC can bring to a region, policymakers have taken great interest in creating institutional environments conducive for VC investment with the intent of creating jobs and growing the economy (Lerner and Tåg, 2013). Even though a wide range of research has been conducted on how specific policies determined by policymakers influence VC investment (Black and Gilson, 1998; Gompers and Lerner, 1998; Kemeny *et al.*, 2014; Keuschnigg and Nielsen, 2003, 2004; Lerner and Tåg, 2013; Poterba, 1989), a notable gap exists in the literature on how political context, and in particular, political party affiliation, affects VC investment.

To fill the gap on VC and the political context shaped by political party preference, this empirical study focuses on partisanship between leaders at the state and national levels in the U.S. and its influence on VC investment. Hence, we observe election results from both the executive

branch leaders of a state (governor) and of the nation (president), who are elected from one of two representative political parties: the Republican Party ("Red") and the Democratic Party ("Blue"), where "the Republican Party is, in general, the more socially conservative and economically libertarian of the two major U.S. parties. It has closer ties to Wall Street (large corporations) and little support among labor union leadership" (Pe'er and Gottschalg, 2011: 1358).

We exploit longitudinal variation in partisanship across the U.S., as determined by a state's elections results for the party affiliation of both the state's elected governor and the state's vote for president of the U.S. Results show that while states voting for a Republican governor did not result in higher VC investment compared to those states that voted for a Democratic governor, a state that elected a Republican governor increased VC investment more if it voted for a Blue president (regardless if that candidate was actually elected to serve as president), compared to a Red presidential candidate. In other words, when a state elects a Red governor and also votes for a Blue presidential candidate, VC investment increases by 18 percent. We also find that as the number of consecutive years a Republican governor sits in office increases by 10 percent, VC investment tends to decrease by 1.3 percent. Finally, results show that while policies that might influence capital gains tax rate and the number of new firms do not help explain the Red governor/Blue president state political effect on VC, policies that improve the quality of financial institutions seem to contribute to this effect.

This paper contributes to existing research in three ways. First, it extends the literature on institutions and investment (Lerner and Tåg, 2013). Second, it adds to the literature on political context and its effect on VC (Pe'er and Gottschalg, 2011). Third, it fills a gap on the topic of VC and partisanship, evaluating how state and national election outcomes might affect VC.

Background

Venture capital, institutional environment, and political context

Across the globe, developing and nurturing entrepreneurship and economic development have become important missions for policymakers, as these actions can lead to job creation and economic growth. Over the last two decades, VC has played a critical role in enhancing innovation ecosystems. Hence, politicians have been keenly interested in increasing the amount of VC activity within their localities, states, and nations (Bottazzi and Da Rin, 2002; Samila and Sorenson, 2011a). An important part element of attracting VC is creating an institutional environment conducive to investment (Lerner and Tåg, 2013).

Relying upon institutional theory (North, 1990; Scott, 1995), scholars have extensively studied how the institutional environment influenced by policies affects private equity, and in particular, VC. Such policies include: federal tax systems (Gompers and Lerner, 1998; Keuschnigg and Nielsen, 2003, 2004; Poterba, 1989), intellectual property rights (IPRs) (Kemeny *et al.*, 2014; Lerner and Tåg, 2013; Samila and Sorenson, 2011b), labor market regulations (Bosma and Levie, 2010; Bozkaya and Kerr, 2013; Jeng and Wells, 2000), and financial markets (Black and Gilson, 1998; Michelacci and Suarez, 2004).

Politicians play an important role in shaping the institutional environment through policymaking (Persson, 2002). They decide upon regulations and policies that may be important to investors (Da Rin, Nicodano, and Sembenelli, 2006; Gompers and Lerner, 2004). For example, politicians determine state and federal tax rates, where lower capital gains tax rates have been shown to lead to higher levels of VC fundraising and investment (Gompers and Lerner, 1998; Keuschnigg and Nielsen, 2003, 2004). Importantly, the types of policies and the ways that they are implemented primarily depend upon the party affiliation of politicians (Cohen, 2003). While

there are numerous studies that have evaluated different policies and their relationship to VC, little is known about how party preference directly affects VC investment.

Political parties, elections, and venture capital

In the U.S., there are two major representative political parties along all levels of government (i.e., local, state, and national) (Conover and Feldman, 1981). The Republican Party is generally known as the conservative party, aligning more predominantly with economic freedom (e.g., lower taxation and regulation, especially to businesses) and social conservatism (e.g., pro-life, pro-traditional marriage, strict immigration policy). The Democratic Party is generally known as the liberal party, aligning more predominantly with economic involvement (e.g., higher taxation on the wealthy and businesses, anti-Wall Street) and social activism (e.g., loose immigration policy, increasing the minimum wage, climate change) (Pe'er and Gottschalg, 2011). While other parties do exist, they have played a relatively insignificant role compared to the Republican and Democratic parties.

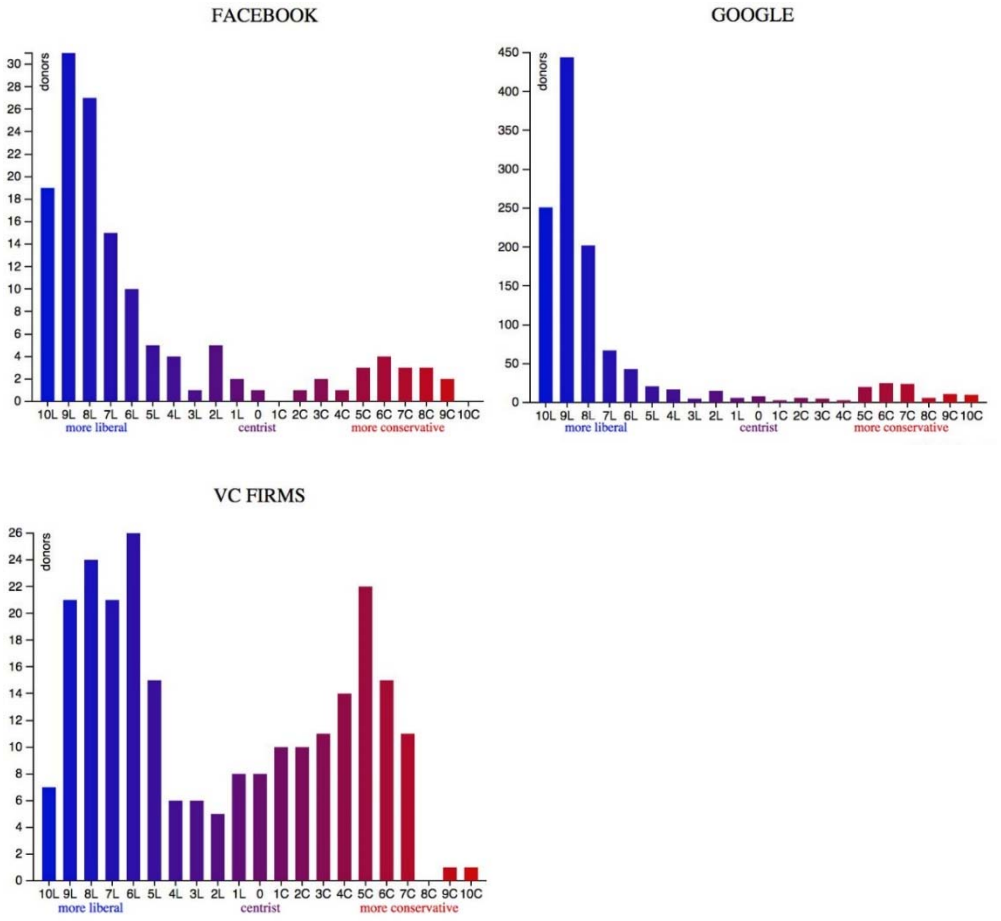
The U.S. has executive leadership at both the state and national levels. The leader of a state's executive branch is the governor, who is elected by state citizens every four years (with the exception of New Hampshire and Vermont, which hold elections every two years). The majority of gubernatorial elections (39 of the 50 states) are held in years not concurrent with presidential elections (www.eac.gov). Much like the president of the U.S., governors have state powers associated with the budget, appointment of judges and heads of agencies, and the ability to veto state legislative actions. The governor influences the environment in which VC and entrepreneurial firms operate (Barrilleaux and Berkman, 2003). For example, the state of Indiana, through its top economic development agency that reports to the governor's cabinet, provides a tax credit (against Indiana tax liability) to VCs that invest in Indiana startups.

The president is the executive branch leader of the nation (elected every four years) and has similar powers to those of the state governor, as previously described, but at the national level. For instance, the president appoints cabinet members who oversee the Small Business Administration and Economic Development Agency, as well as appoints the members of the Federal Reserve (www.usa.gov). In each presidential election, citizens vote for a presidential candidate and each state's electoral votes are generally appropriated to the state's popular vote winner. Regardless if the chosen candidate becomes the president, that state is then considered a Red or a Blue state, depending on the party affiliation of the candidate they selected, until the next presidential election. Both the governor and the president are critical players in the way policies are adopted in the U.S.

Politicians gain votes when voters seek to maximize utility from the policies that they believe the candidate will implement (Downs, 1957). When a state then votes or elects a politician, it represents the sum of voter preferences across that state. Along these lines, the VC industry can be considered to be firms that are comprised of managers who, as individuals, have voting preferences and seek to maximize their utility.

Because political party orientation affects policies that are important to VCs (Cohen, 2003) —specifically tax, entrepreneurship, and financial institution policies—political party affiliation may have an influence on VC, although it is not completely clear which party VCs prefer. On one hand, VCs are financially driven and may be interested in implementing policies related to lowering capital gains tax rates and small business incentives. These are policies that align with the Republican Party platform. On the other hand, VC partners were once successful entrepreneurs at VC-backed companies, and generally, VC-backed entrepreneurs are known to be more aligned with the Democratic Party (Bonica, 2013). Using data gathered on over 100 million political

contributions made by individuals and organizations to local, state, and national candidates from 1979 to 2012, Bonica (2013) found that VC firms are much more balanced in their contributions to both the Democratic and Republican parties compared to entrepreneurs from large VC-backed, entrepreneurial companies (i.e., Facebook and Google), which greatly skew Democratic (Fig. 4.1).



Note. Source: www.crowdpac.com.

Figure 4.1 Political contributions made by individuals and organizations to local, state, and national candidates from 1979 to 2012

In the following sections, we describe our methodology for testing how political party orientation influences VC and present results. In particular, we are interested in understanding if political party orientation of a governor has an effect on VC, as well as understanding if balance (i.e., Red governor/Blue president) between a state's preference for governor and president matters. We then observe the effects of stability of Republican gubernatorial regime, as well as the following policies: (1) capital gains tax rate, (2) a proxy for pro-entrepreneurship policy, and (3) a proxy for policies that improve the quality of financial markets. Finally, we discuss policy mechanisms that might help explain political context effects.

Data and Estimation

Data

Our empirical analysis relies on a balanced panel of the 50 U.S. states from 1980 to 2013. From the Thomson-Reuters' VentureXpert dataset, which was used to gather data on VC investment, we included any deals realized across the time period and collected information about the amount of equity invested per deal, investment date, the location of both the investee and the investor, as well as the number of VC-backed IPOs. State election voting selections for governor and U.S. president were gathered using Dave Leip's Atlas of Presidential Elections (http://uselectionatlas.org) (Kim, Pantzalis, and Chul Park, 2012; Pe'er and Gottschalg, 2011). The number of new firms for each state was gathered from the U.S. Census Bureau's Business Dynamics Statistics (BDS) database, and maximum total capital gains tax rate was gathered from the National Bureau for Economic Research (NBER). Finally, we gathered state GDP data from the BEA. Overall, we constructed a balanced panel dataset of 1,700 state-year observations. The choice of the timeframe was determined by the fact that the Thomson-Reuters' VentureXpert dataset, which was used to gather

data on VC investment, has limited coverage on investments realized in the 1970s (Gompers and Lerner, 2004).

Variables

Dependent variables

Venture capital investment. Similarly to Samila and Sorenson (2011a), we defined VC investment as the equity investment associated with any VC deal and took into account all VC deals at different stages of financing: seed, early, later or in balanced stages. Deal equity was aggregated into state-year observations (by investee headquarter location and investment year), and a value of zero was assigned to 209 missing state-year observations.

Independent variables

Election dummy variables. We created dummy variables measuring the party affiliation of the popular vote selection for state gubernatorial and national presidential elections, as established by elections from 1980-2013. In particular, the *Governor (Red)* dummy equals 1 the year after a Republican governor is elected (when the governor actually sits in office) and 0 otherwise. Similarly, the *President (Blue)* dummy equals 1 the year after a Democrat wins the electoral votes from the state in a presidential election and 0 otherwise. Because elections in the U.S. are generally held in November, we assume that there exists an almost immediate effect on VC investments, starting in January of the following year. The excluded variable for the gubernatorial dummy is

Governor (Blue) and the excluded variable for the presidential dummy is *President (Red)*. Importantly, dummy values remain constant until the subsequent gubernatorial and presidential elections, respectively.

Governor stability. We created a variable measuring the stability (or consistency) of a state's preference for a political party occupying the governor's seat. From the beginning of the

time period in the sample, the *Governor Stability* variable is equal to 0 the first year a governor is serving in office and each subsequent year of her/his term is a cumulative sum of the previous consecutive years as governor. In the following gubernatorial election, if the incumbent (if retaining the same party affiliation) or another candidate with the same party affiliation is elected, the cumulative sum continues. However, if at any point, the opposing party candidate wins the election, the stability measure is reset to 0 in the first year that the opposing party governor is in office.

Capital gains tax rate. Following previous studies on capital gains tax and VC (Gompers and Lerner, 1998; Poterba, 1989), we gathered data on maximum state and federal capital gains tax rates by each state-year as a measure of tax policy. Federal capital gains tax rates vary from state to state because of deductions that might be taken on federal taxes from state income taxes. We define *Capital gains tax rate* as the sum of both state and federal capital gains tax rates and represents the maximum possible rate that a VC might pay in capital gains from exited investments.

New firms. As a proxy for the presence of pro-entrepreneurship policy, we gathered data on the number of new firms established by a state each year. The definition of *new firms*, as defined by BDS, is the number of firms that have been formed less than one year before the annual survey.

IPOs. We use the number of IPOs as a proxy for the quality of financial institutions (Lerner and Tåg, 2013). The number of *IPOs* is defined as the number of VC-backed companies that exit through an IPO. This variable was aggregated into state-year observations (by investee headquarter location and IPO year), and a value of zero was assigned to 1,094 missing state-year observations.

Control variables

We include control variables in the regression to limit the possibility that our results are biased due to the omission of important confounding factors.

State GDP. Using BEA data, we control for state GDP, as it is a state-specific, within-state factor that could possibly confound our results. For instance, in richer states, due to a more active economic environment, it is more likely that policymakers will vote for policies that will affect investment.

State Fixed Effects. We included state-specific fixed effects, in order to control for all time-invariant factors for each state. These effects may include factors, such as state culture.

Year Fixed Effects. We included year dummies, in order to account for variations in the economic environment which might affect VC, such as, for instance, annual changes in interest rates, inflation, and national GDP.

The list of all variables and their measures is provided in Table 4.1.

Methodology

We evaluated the 34-year panel using a state fixed effects model. Thus, our methodology resembles a typical diff-and-diff strategy, through which we compare, for instance, whether states that voted for a Republican governor experience a change in VC investments more than states that voted for a Democratic governor.

Our baseline model includes year dummies to capture idiosyncratic shocks:

$$\ln(VC\ investment_{i,t}) = \beta_0 + \beta_1 RED\_GOVERNOR_{i,t-1} +$$

$$\beta_2 BLUE\_PRESIDENT_{i,t-1} + \beta_3 \ln STATEGDP_{i,t-1} + \gamma_i + c_i + \varepsilon_{i,t}, \quad (4.1)$$

where *i* indexes the state and *t* indexes the year, β the unknown parameter vectors, $VC\ investment_{i,t}$ is the amount of money invested in a certain state and year in VC deals, $RED\_GOVERNOR_{i,t-1}$ and $BLUE\_PRESIDENT_{i,t-1}$ are the election dummy variables, $STATEGDP_{i,t-1}$ is the state GDP control variable, γ_i represents the series of year-fixed effects, c_i represents state-fixed effects, and $\varepsilon_{i,t}$ is

the error term. Regarding the error term, to account for the presence of serial correlation and to avoid inconsistent standard errors, we clustered observations at the state-level—the state where companies that receive VC investment are located (Bertrand *et al.*, 2004).

Table 4.1 Operationalization of variables

Variable	Operationalization
VC investment	The amount of VC equity invested in each state (by location of investee company), in millions of nominal USD (all VC investments). Source: Thomson Reuters' VentureXpert.
Governor (Red)	Dummy equal to 1 if a state has elected a Republican governor. Sources: http://uselectionatlas.org
President (Blue)	Dummy equal to 1 if a state has assigned its electoral votes to a Democratic presidential candidate. Sources: http://uselectionatlas.org
Balance (Red governor/Blue president)	Interaction of Governor (Red) and President (Blue). Source: http://uselectionatlas.org
State GDP	Annual state gross domestic product, in millions of USD. Source: BEA.
Governor stability	The cumulative number of consecutive years that a governor's party is in office following the first year of a governor's term. Source: http://uselectionatlas.org
Independent governor	Dummy equal to 1 if a state has elected an Independent governor. Source: http://uselectionatlas.org
Total capital gains tax rate	The total (state and federal) maximum capital gains tax rate in each state. Source: NBER.
New firms	The number of firms that have an age of zero years in each state. Source: Business Dynamics Statistics.
IPOs	The number of venture-backed company IPOs in each state. Source: Thomson Reuters' VentureXpert.
State fixed effects	The state in which an investee company headquarters is located. Source: Thomson Reuters' VentureXpert.
Year fixed effects	The year in which investments are made in investee companies. Source: Thomson Reuters' VentureXpert.

We then observe whether states that voted for a Republican governor increase VC investments after voting for a Democratic presidential candidate, which is represented by the following:

$$\ln(VC\ investment_{i,t}) = \beta_0 + \beta_1 RED\_GOVERNOR_{i,t-1} +$$

$$\beta_2 BLUE\_PRESIDENT_{i,t-1} + \beta_3 (RED\_GOVERNOR * BLUE\_PRESIDENT)_{i,t-1} +$$

$$\beta_4 \ln STATEGDP_{i,t-1} + \gamma_i + c_i + \varepsilon_{i,t}, \quad (4.2)$$

where $(RED\_GOVERNOR\ X\ BLUE\_PRESIDENT)_{i,t-1}$ is the interaction between the election dummy variables.

Next, we observe whether states that are more consistent or stable in their support for Republican governors decrease VC investments, which is represented by the following:

$$\ln(VC\ investment_{i,t}) = \beta_0 + \beta_1 RED\_GOVERNOR_{i,t-1} +$$

$$\beta_2 BLUE\_PRESIDENT_{i,t-1} + \beta_3 (RED\_GOVERNOR\ X\ BLUE\_PRESIDENT)_{i,t-1} +$$

$$\beta_4 \ln (GOVERNOR\_STABILITY)_{i,t-1} + \beta_5 (RED_{GOVERNOR} *$$

$$ln\ (GOVERNOR\_STABILITY))_{i,t-1} + \beta_6 \ln STATEGDP_{i,t-1} + \gamma_i + c_i + \varepsilon_{i,t}, \quad (4.3)$$

where $(RED\_GOVERNOR * GOVERNOR\_STABILITY)_{i,t-1}$ is the interaction between the Red governor dummy variable and the log of governor stability.

Finally, we evaluate the mechanisms that might help explain any political effects from balance, represented by the following:

$$\ln(VC\ investment_{i,t}) = \beta_0 + \beta_1 RED\_GOVERNOR_{i,t-1} +$$

$$\beta_2 BLUE\_PRESIDENT_{i,t-1} + \beta_3 (RED\_GOVERNOR * BLUE\_PRESIDENT)_{i,t-1} +$$

$$\beta_4 GOVERNOR\_STABILITY_{i,t-1} + \beta_5 (RED\_GOVERNOR *$$

$$GOVERNOR\_STABILITY)_{i,t-1} + \beta_6 POLICY_{i,t-1} + \beta_7 \ln STATEGDP_{i,t-1} + \gamma_i + c_i +$$

$$\varepsilon_{i,t}, \quad (4.4)$$

where $POLICY_{i,t-1}$ is one of three different policy mechanisms, namely the maximum combined state and federal capital gains tax rate, the log of the number of new firms, and the log of the number of IPOs.

Results

In Tables 4.2 and 4.3, we present the summary statistics of the variables used in the empirical analysis and their pairwise correlations, respectively. First of all, we found that, as expected, equity investment is unevenly distributed across states, with California, Massachusetts and Texas accounting for a large portion of VC investment each year, while states such as Alaska and Wyoming report almost no VC investment. Concerning political affiliation, Red governors and states that voted Blue for president made up 48% and 37% of state-year observations, respectively, whereas 16% of observations were both Red governor and Blue presidential states.

Table 4.2 Descriptive statistics

Variable	N	Mean	Std. Dev.	Min.	Max.
VC investment	1,700	363.54	1,759.37	0.00	43,017.95
Red governor	1,700	0.48	0.50	0.00	1.00
Blue state – presidential election	1,700	0.37	0.48	0.00	1.00
Red governor/Blue state	1,700	0.16	0.37	0.00	1.00
State GDP	1,700	176,321.22	249,599.40	4,856.00	2,202,678.00
Government stability	1,700	5.63	5.60	0.00	33.00
Capital gains tax rate	1,650	0.25	0.06	0.15	0.37
New firms	1,650	9,704.57	11,235.72	862.00	74,879.00
IPOs	1,700	1.68	6.38	0.00	123.00

Table 4.3 Correlations

Variable	1.	2.	3.	4.	5.	6.	7.	8.	9.
1. VC investment	1.00								
2. Red governor	0.01	1.00							
3. Blue state – presidential election	0.18***	-0.08**	1.00						
4. Red governor/Blue state	0.12***	0.46***	0.57***	1.00					
5. State GDP	0.63***	0.08**	0.24***	0.20***	1.00				
6. Government stability	-0.01	0.04	0.12***	0.02	0.07**	1.00			
7. Capital gains tax rate	-0.04	-0.02	0.03	0.02	-0.17***	-0.09***	1.00		
8. New firms	0.49***	0.07**	0.08**	0.12***	0.81***	-0.02	0.03	1.00	
9. IPOs	0.71***	0.05	0.14***	0.15***	0.49***	0.01	0.11***	0.55***	1.00

*$p < 0.1$; **$p < 0.05$; ***$p < 0.01$.

Regression results are shown in Table 4.4. In all baseline models, the dependent variable is (the log of) VC equity investment by state-year. Models include political affiliation variables, as well as the GDP variable and state and year fixed effects.

In Model 1, the political affiliation related to both the elected governor and the state's preference for president did not have a significant effect on VC investment. In Model 2, the interaction of Red governor and Blue presidential state is added and found to be positive and significant ($\beta_3 = 0.176$, $p < 0.10$). Finally, Model 3 includes government stability and the interaction of Red governor and government stability. The latter was found to be negative and significant ($\beta_5 = 0.203$, $p < 0.10$), while the interaction of Red governor and Blue president state remained significant ($\beta_3 = -0.134$, $p < 0.10$). Therefore, a balance of voting for a Blue presidential candidate when a state has elected a Red governor increases VC investment.

In Tables 4.5, 4.6, and 4.7, results are shown with the addition of proxy variables that may be influenced by a state's political preference for governor and president. In Table 4.5, the

dependent variable is maximum total capital gains tax rate in Model 1 and the log of VC investment in Model 2. A balance between a Red governor and Blue president state was shown to not have an effect on VC investment. However, the addition of capital gains tax rate to the baseline increased both the magnitude and significance of balance on investment (Table 4.5, Model 2: $\beta_3 = 0.219$, $p < 0.05$).

Table 4.4 Impact of partisanship on VC investment

Variables	(1) ln VC investment	(2) ln VC investment	(3) ln VC investment
Governor (Red)	0.022	-0.043	0.135
	(0.060)	(0.070)	(0.115)
President (Blue)	0.065	-0.015	-0.033
	(0.096)	(0.111)	(0.111)
Balance (Red/Blue)		0.176*	0.203*
		(0.102)	(0.102)
ln government stability			0.021
			(0.049)
Governor (Red) *			-0.134*
ln government stability			(0.078)
ln state GDP (*t*-1)	1.813***	1.820***	1.869***
	(0.376)	(0.374)	(0.375)
Constant	-17.436***	-17.472***	-18.037***
	(3.875)	(3.859)	(3.863)
State fixed effects	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes
Clusters (states)	50	50	50
Observations	1,700	1,700	1,700
Adj. R-squared	0.663	0.664	0.666

Notes. OLS regression results in columns (1)-(3). Robust standard errors in parentheses. Disturbances are clustered by state. The unit of observation is the state-year, and the data cover the 50 United States from 1980 to 2013. In models (1)-(3), the dependent variable is the log of VC investment from all VC investment sources.
*$p < 0.1$; **$p < 0.05$; ***$p < 0.01$.

Table 4.5 Capital gains tax rate and partisanship

Variables	(1) Capital gains tax rate	(2) ln VC investment
Capital gains tax rate (*t*-1)		2.502
		(4.635)
Governor (Red)	0.014**	0.049
	(0.007)	(0.084)
President (Blue)	0.006	-0.043
	(0.008)	(0.110)
Balance (Red/Blue)	-0.013	0.219**
	(0.009)	(0.103)
ln government stability	0.001	0.007
	(0.001)	(0.009)
Governor (Red) *	-0.002	-0.024
ln government stability	(0.001)	(0.015)
ln state GDP (*t*-1)	-0.036	1.884***
	(0.038)	(0.373)
Constant	-0.602	-18.869***
	(0.393)	(4.288)
State fixed effects	Yes	Yes
Year fixed effects	Yes	Yes
Clusters (states)	50	50
Observations	1,650	1,700
Adj. R-squared	–	0.665

Notes. Fractional logit results in column (1) and OLS regression results in column (2). Robust standard errors in parentheses. Disturbances are clustered by state. The unit of observation is the state-year. In model (1), the dependent variable is maximum total (state and federal) capital gains tax rate. In model (2), the dependent variable is the log of VC investment from all VC investment sources.
*$p < 0.1$; **$p < 0.05$; ***$p < 0.01$.

In Table 4.6, the dependent variable is the log of the number of new firms in Model 1 and the log of VC investment in Model 2. Similar to the capital gains tax rate, political balance was not found to have an effect on the number of startup companies. The inclusion of a proxy for pro-entrepreneurship policy to the baseline increased both the magnitude and significance of balance on investment (Table 4.6, Model 2: $\beta_3 = 0.233$, $p < 0.05$). Additionally, the interaction between

Red governor and the log of governor stability was negative and significant (Table 4.6, Model 2: β_5 = -0.027, p < 0.10). In both tables, capitals gains tax rate and new firms do not have any significant effect on VC investment.

In Table 4.7, the dependent variable is the log of the number of IPOs, as a proxy for the quality of financial markets, in Model 1 and the log of VC investment in Model 2. In Model 1,

Table 4.6 Entrepreneurship and partisanship

Variables	(1) ln new firms	(2) ln VC investment
ln new firms (*t*-1)		0.607
		(0.462)
Governor (Red)	-0.002	0.057
	(0.014)	(0.086)
President (Blue)	-0.027	-0.030
	(0.019)	(0.110)
Balance (Red/Blue)	-0.044**	0.233**
	(0.017)	(0.110)
ln government stability	-0.001	0.008
	(0.001)	(0.009)
Governor (Red) *	0.006**	-0.027*
ln government stability	(0.002)	(0.014)
ln state GDP (*t*-1)	0.711***	1.415**
	(0.085)	(0.610)
Constant	1.376	-18.667***
	(0.878)	(4.069)
State fixed effects	Yes	Yes
Year fixed effects	Yes	Yes
Clusters (states)	50	50
Observations	1,650	1,700
Adj. R-squared	0.693	0.667

Notes. OLS regression results in columns (1)-(2). Robust standard errors in parentheses. Disturbances are clustered by state. The unit of observation is the state-year. In model (1), the dependent variable is the log of new firms. In model (2), the dependent variable is the log of VC investment from all VC investment sources.
*$p < 0.1$; **$p < 0.05$; ***$p < 0.01$.

results show that balance has a positive and significant effect on the number of IPOs (Table 4.7, Model 1: $\beta_3 = 0.107$, $p < 0.10$). When the number of IPOs is added as an independent variable to the baseline, this variable was also positive and significant on VC investment (Table 4.7, Model 2: $\beta_6 = 0.108$, $p < 0.05$). Political balance remained positive and significant (Table 4.7, Model 2: $\beta_3 = 0.199$, $p < 0.10$) and the interaction of Red governor and the log of governor stability was negative and significant (Table 4.7, Model 2: $\beta_5 = -0.148$, $p < 0.10$). Although Model 2 tests the number of IPOs at time *t*-1, Model 3 operationalizes this measure at time *t* to make sure that an increase in equity distributions is not driven by reinvested cash proceeds from IPO exits. Results show that this is not a concern, as the measure remains positive and significant (Table 4.7, Model 3: $\beta_6 = 0.127$, $p < 0.01$).

Because there may be a concern that results are driven by states where major VC activity occurs, robustness checks were conducted. This concern is particularly salient for pre-Clinton California. The state of California was a Republican stronghold for presidential elections from 1952-1988 (only voting Blue in the 1964 election), but as a result of the 1992 election Democratic platform, it has developed into a Blue presidential state. Table 4.8 shows that even when excluding California in Model 1 and when excluding California, Massachusetts, and New York in Model 2, results hold for balance, the number of IPOs, and red governor stability.

Another concern may be the exclusion of variables that identify third-party candidates who do not affiliate with the Republican or Democrat parties. First, we test the robustness of results to the exclusion of state-year observations with Independent governors (Model 1). In Model 2, we also excluded the 1992 presidential election—and so the state-year observations from 1993-1996—where Ross Perot, an Independent candidate, obtained 18.9% of the popular vote. As shown in Table 4.9, results are significantly similar.

Table 4.7 Initial public offerings and partisanship

Variables	(1) ln IPOs	(2) ln VC investment	(3) ln VC investment
ln IPOs (*t*-1)		0.108**	
		(0.047)	
ln IPOs			0.127***
			(0.392)
Governor (Red)	0.015	0.164	0.133
	(0.062)	(0.115)	(0.114)
President (Blue)	-0.084	-0.035	-0.022
	(0.057)	(0.112)	(0.109)
Balance (Red/Blue)	0.107*	0.199*	0.189*
	(0.062)	(0.101)	(0.100)
ln government stability	0.011	0.028	0.020
	(0.028)	(0.049)	(0.049)
Governor (Red) *	-0.030	-0.148*	-0.130*
ln government stability	(0.036)	(0.079)	(0.077)
ln state GDP (*t*-1)	0.324***	1.811***	1.828***
	(0.114)	(0.346)	(0.367)
Constant	-3.323***	-17.228***	-17.616***
	(1.210)	(3.587)	(3.785)
State fixed effects	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes
Clusters (states)	50	50	50
Observations	1,700	1,650	1,700
Adj. R-squared	0.260	0.648	0.667

Notes. OLS regression results in columns (1)-(3). Robust standard errors in parentheses. Disturbances are clustered by state. The unit of observation is the state-year. In model (1), the dependent variable is the log of the number of IPOs from venture-backed companies. In models (2)-(3), the dependent variable is the log of VC investment from all VC investment sources.
*$p < 0.1$; **$p < 0.05$; ***$p < 0.01$.

Table 4.8 Impact of partisanship on VC investment: Excluding major VC states

Variables	(1) ln VC investment (excl. CA)	(2) ln VC investment (excl. CA, MA, & NY)
ln IPOs (*t*-1)	0.123**	0.147***
	(0.049)	(0.049)
Governor (Red)	0.169	0.199*
	(0.118)	(0.118)
President (Blue)	-0.039	-0.063
	(0.113)	(0.115)
Balance (Red/Blue)	0.201*	0.223**
	(0.105)	(0.109)
ln government stability	0.033	0.049
	(0.049)	(0.048)
Governor (Red) *	-0.146*	-0.170**
ln government stability	(0.081)	(0.081)
ln state GDP (*t*-1)	1.807***	1.859***
	(0.346)	(0.342)
Constant	-17.199***	-17.770***
	(3.574)	(3.509)
State fixed effects	Yes	Yes
Year fixed effects	Yes	Yes
Clusters (states)	49	47
Observations	1,617	1,551
Adj. R-squared	0.643	0.634

Notes. OLS regression results in columns (1)-(2). Robust standard errors in parentheses. Disturbances are clustered by state. The unit of observation is the state-year. In all models, the dependent variable is the log of VC investment from all VC investment sources. In model (1), California is excluded from the sample. In model (2), California, Massachusetts, and New York are excluded. State-year observations with independent governors are also excluded.
*$p < 0.1$; **$p < 0.05$; ***$p < 0.01$.

Table 4.9 Impact of partisanship on VC investment: Excluding observations with independent governors and the 1992 election (with Ross Perot)

Variables	(1) ln VC investment	(2) ln VC investment
ln IPOs (*t*-1)	0.102**	0.118***
	(0.046)	(0.041)
Governor (Red)	0.189	0.248*
	(0.116)	(0.128)
President (Blue)	-0.019	-0.008
	(0.110)	(0.112)
Balance (Red/Blue)	0.203*	0.240**
	(0.104)	(0.112)
ln government stability	0.042	0.061
	(0.050)	(0.056)
Governor (Red) *	-0.159**	-0.204**
ln government stability	(0.079)	(0.085)
ln state GDP (*t*-1)	1.790***	1.769***
	(0.345)	(0.349)
Constant	-17.036***	-16.844***
	(3.590)	(3.621)
State fixed effects	Yes	Yes
Year fixed effects	Yes	Yes
Clusters (states)	50	50
Observations	1,617	1,551
Adj. R-squared	0.648	0.679

Notes. OLS regression results in columns (1)-(2). Robust standard errors in parentheses. Disturbances are clustered by state. The unit of observation is the state-year. In both models, the dependent variable is the log of VC investment from all VC investment sources. State-year observations with independent governors are excluded. In model (2), the 1992 election (and thus observations from 1993-1996) are excluded.
*$p < 0.1$; **$p < 0.05$; ***$p < 0.01$.

Table 4.10 Impact of partisanship on VC investment: Blue governor/Red presidential state

Variables	(1) ln VC investment	(2) ln VC investment
ln IPOs (*t*-1)		0.110**
		(0.047)
Governor (Blue)	-0.320**	-0.346**
	(0.133)	(0.145)
President (Red)	-0.153	-0.149
	(0.110)	(0.113)
Balance (Blue/Red)	0.171	0.168
	(0.106)	(0.105)
ln government stability	-0.100**	-0.106**
	(0.047)	(0.047)
Governor (Blue) *	0.134*	0.148**
ln government stability	(0.072)	(0.073)
ln state GDP (*t*-1)	1.855***	1.794***
	(0.375)	(0.346)
Constant	-17.600***	-16.745***
	(3.880)	(3.624)
State fixed effects	Yes	Yes
Year fixed effects	Yes	Yes
Clusters (states)	50	50
Observations	1,700	1,650
Adj. R-squared	0.665	0.648

Notes. OLS regression results in columns (1)-(2). Robust standard errors in parentheses. Disturbances are clustered by state. The unit of observation is the state-year. In both models, the dependent variable is the log of VC investment from all VC investment sources.
*$p < 0.1$; **$p < 0.05$; ***$p < 0.01$.

Finally, we observe the effects of a Blue governor/Red state political configuration in Table 4.10. In both models, while balance is significant only to the 12% confidence level, it still has a positive effect on VC (Table 4.10, Model 1: $\beta_{3\ B/R} = 0.171$, $p < 0.12$; Model 2: $\beta_{3\ B/R} = 0.168$, $p < 0.12$), which shows that balance is reasonably similar in either scenario. One difference, however, is that stability in a Democratic gubernatorial regime seems to have a positive effect on VC.

Discussion and Conclusion

Extant literature evaluates the role that policies have in driving VC investment (Da Rin *et al.*, 2006; Gompers and Lerner, 2004; Lerner and Tåg, 2013). However, little is known about the impact of political context, and in particular, political party affiliation of policymakers, on VC. In this paper, we focus on how a state's political preference for its executive branch leader, the governor, and for the nation's executive branch leader, the president, affects VC investment within states across the U.S.

Exploiting longitudinal variations in the party affiliation of elected governors and a state's section for president across the U.S., we do not find evidence that party affiliation of a governor or presidential candidate directly influences the amount of VC investment in a state. Thus, political orientation of a state, in terms of preference for a governor or presidential candidate, does not seem to matter to VCs. However, when a state elects a Red governor and also votes for a Blue presidential candidate, VC investment increases by 18 percent. In addition, we find that as the number of consecutive years a Republican governor sits in office increases by 10 percent, VC investment decreases by 1.3 percent. Finally, we show that policies that improve the quality of financial markets for VC exits might contribute to the explanation on why the political effect from balance is positive.

While political science literature refers to balancing as split-ticket voting within the same level of government (i.e., state or national) (Fiorina, 1991), we extend this definition to gubernatorial and presidential candidates. The positive and significant effect of balance on VC investment suggests that balance leads to more VC investment, which is consistent with how VCs donate funds to political campaigns (Bonica, 2013). One possible explanation for this effect

follows Fiorina (1991) and the notion that balance leads to moderation or less extreme policies, which decreases uncertainty about the environment.

Because politicians might be less complacent about their chances for re-election when a state votes for balance rather than continually voting for the same party in both gubernatorial and presidential elections (Zupan, 1991), balance might also lead to increases in efficiency and effectiveness through policies that influence VC. Even though the capital gains tax rate and the number of new firms were not found to drive such an effect on investment, results show that (1) balance has a positive and significant effect on the number of IPOs, as a proxy for the quality of financial institutions, and (2) balance and IPOs both contribute to a positive effect on VC investment (Black and Gilson, 1998; Michelacci and Suarez, 2004). Regarding a state's political orientation and its correlation with the quality of financial institutions, it seems that balance would signal a more predictable policy environment over time (Fowler, 2006), which would be important for companies looking to go public and a major consideration of institutional investors when funding an IPO.

This study contributes to the literature in several ways. First, it extends the literature on the impact of institutions on investment (Lerner and Tåg, 2013; Taussig and Delios, 2014). It suggests that political context is an important consideration by investors and helps determine where investments are made. In particular, we investigate whether political party orientation, which helps shape the institutional environment, has an impact on VC distributions.

Second, it extends the literature on political context and its effect on VC (Pe'er and Gottschalg, 2011). Previous literature has shown that political context influences outcomes that are important to VCs, such as firm performance (Kim *et al.*, 2012; Pe'er and Gottschalg, 2011), but has failed to directly apply it to VC investment. We observe the investment impact of political

party affiliation of a governor or a presidential candidate and test how the stability of a party's gubernatorial regime influences the geography in which VCs invest. Additionally, we test tax, entrepreneurship, and financial market policies as mechanisms to explain the political effects on VC, adding to the literature on policy and VC (Gompers and Lerner, 2001).

Third, we fill a gap on the topic of VC and partisanship, evaluating how state and national election outcomes might affect VC. In this study, we do not find evidence that the political party orientation of a state directly affects VC investment, per se, but that voting for party balance between governor and president does. This result not only gives us insights into the types of environments that VCs find conducive to invest in, but also suggests that elections play an important role in determining the future of innovation and entrepreneurship in a state and country.

This empirical study has some limitations. First, a shortcoming of our study is that the database we use for retrieving information on VC exits, VentureXpert, has limited data available on investments for the 1970s (Gompers and Lerner, 2004). Therefore, the number VC-backed IPOs reported in the early 1980s would be lower than the actual volume of IPOs. Another limitation is that we use a number of proxies as mechanisms that may explain the political party effect on VC investment. Future research should seek to further dissect these measures to better understand how specific policies influence VC activity.

Notwithstanding these limitations, this study points to implications for both managers and policymakers. Entrepreneurs might choose to locate their companies in Red governor/Blue president states, where VC investment is higher. They might also be actively involved in lobbying for balance within their states, thus resulting in a more attractive environment for VCs to invest.

Concerning implications to policymakers, this study provides evidence that might suggest that states with less extreme political preferences attract more VC investment. We find that

increases in the stability of a Republican gubernatorial regime leads to a decrease in VC investment. Particularly in states looking to improve economic development, these results may inform campaign strategy in states with a Red governor. Additionally, policymakers might seek to improve the quality of financial markets, as a way to increase VC investment. Future studies might investigate other measures beyond the proxies tested in this paper to better understand specific policies which have been implemented, such as immigration reform or regulatory policies.

5 Summary and Conclusions

This dissertation investigates the effects of institutional environment on investment and performance in the private equity industry. It provides insights on how trade secret protection can increase VC investment through a state court's favorability toward the inevitable disclosure doctrine, the effect of anti-takeover regulation as it relates to private equity firm buyout performance, and the role that political context has in determining VC distributions to different states. As such, it provides a deeper understanding of how certain institutional factors shape VC activity across geographies.

The second chapter discusses how a form of trade secret protection, the inevitable disclosure doctrine, affects the geography of VC investment. If a state favors the inevitable disclosure doctrine, (1) it could reduce the possibility of employees from leaving investee firms to join a competing company and (2) it would increase the predictability of a subsequent court ruling on the doctrine. Compared to having no rule, a rule in favor of inevitable disclosure increases VC investment in a state by 83 percent, whereas a rule against inevitable increases VC investment by 30 percent. Additionally, having a rule in favor of inevitable disclosure increases the proportion of VC investment in deals with at least one non-local investor by 6 percent compared with having no rule on the doctrine.

The third chapter presents that experience acquired from buyouts in the PE industry translates more into learning to select targets, rather than learning to add value, such that more experienced PE firms perform better when the educational background of top managers at the PE firm is more finance-oriented. Conversely, performance is worse when the educational background of top managers is more business-oriented and the information environment is more transparent.

The fourth chapter discusses how political party orientation influences VC investment. Political orientation of a state, in terms of preference for a governor or presidential candidate, does not seem to matter to VC. However, when a state elects a Red governor and also votes for a Blue presidential candidate, VC investment increases by 18 percent. In addition, we find that as the number of consecutive years a Republican governor sits in office increases by 10 percent, VC investment decreases by 1.3 percent. Finally, we show that policies that improve the quality of financial markets for VC exits might contribute to the explanation on why the political effect from (Red governor/Blue president) balance is positive.

This work will hopefully lead to deeper investigations into additional institutional factors that affect private equity investment. Such extensions to the current literature would certainly benefit entrepreneurship ecosystems, as findings can better inform policymaking.

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