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DISCUSSION PAPER

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Safeguarding Secrets, Shaping Acquisitions: Trade Secret Protection and the Role of Distance Between Acquirer and Target

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Safeguarding Secrets, Shaping Acquisitions: Trade Secret Protection and the Role of Distance between Acquirer and Target

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ABSTRACT

We investigate whether strengthened legal protection of trade secrets increases the likelihood of a firm being acquired. Stronger protection can make a firm more attractive for acquisition due to better safeguarding of trade secrets, but it may also increase information asymmetries that discourage potential acquirers. Using the staggered implementation of the Uniform Trade Secrets Act (UTSA) in the U.S., we show that stronger trade secret protection increases the likelihood of being acquired, but also changes firms' acquisition strategies more broadly depending on the distance between acquirer and target. Compared to domestic acquirers, foreign acquirers are only half as likely to make an acquisition, and they prefer to acquire minority rather than majority stakes. Both domestic and foreign acquirers are more likely to pursue stepwise acquisitions of a target as protection increases, consistent with a real options rationale. Further investigation suggests that, while increased trade secret protection increases information asymmetries for all acquirers, foreign acquirers as well as domestic acquirers located further away from a target are disproportionately affected.

Keywords: trade secret protection, firm acquisitions, ownership stakes, distance, Uniform Trade Secrets Act (UTSA)

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INTRODUCTION

Strategic factor markets, which allow firms to access external resources and assets (Barney, 1986), are governed by a complex institutional framework that determines, among many other aspects, how these resources and assets are protected and how they can be acquired (Besen and Raskind, 1991; Risch, 2007). Among these, trade secrets – including marketing or technical data, manufacturing know-how, or chemical formulae – have often been characterized as the most valuable intellectual assets that firms can possess (e.g., Levin *et al.*, 1987; Cohen, Nelson, and Walsh, 2000). Because trade secrets are typically embedded in a firm's employees, other firms may seek to acquire trade secrets by hiring employees in the labor market (e.g., Kaiser et al., 2018). However, this channel may become unavailable if changes in the institutional framework toward greater legal protection of trade secrets limit the mobility of employees to other employers (Png and Samila, 2015; Contigiani, Hsu, and Barankay, 2018; Chen, Gao, and Ma, 2021).

In this paper, we ask whether and how institutional change toward strengthened trade secret protection leads firms to engage on another strategic factor market, specifically the market for corporate control, to acquire a firm with all its intellectual assets. While previous research has mostly considered the patent portfolio of an acquired firm (e.g., Ahuja and Katila, 2001; Cassiman *et al.*, 2005; Grimpe and Hussinger, 2014), recent contributions show the importance of trade secrets in firm acquisitions (Younge, Tong, and Fleming, 2015; Castellaneta, Conti, and Kacperczyk, 2017; Chen *et al.*, 2021) and identify "acqui-hiring" as a way to access skilled employees through acquisitions (Ng and Stuart, 2022; Kim, 2023). This research would lead us to believe that strengthened trade secret protection makes firms more attractive acquisition targets by improving their competitive position in product markets (Younge *et al.*, 2015) and by

limiting the outward flow of information to competitors, particularly through employee mobility, thereby reducing the risk of misappropriation and imitation (Png and Samila, 2015; Png, 2017a; Contigiani *et al.*, 2018). However, the broader implications of such an institutional change on the behavior of acquirers on the market for corporate control are poorly understood.

On the one hand, strengthened trade secret protection limits the amount of information available about potential targets, increasing information asymmetries between acquirer and target and uncertainty about a potential target's market value. Castellaneta *et al.* (2017) show that the increased uncertainty about the target's value may lead acquirers to discount their offer to compensate for the higher risk of a poor-acquisition investment. On the other hand, strengthened trade secret protection may also facilitate an acquisition as targets can better enforce their trade secrets in case the acquisition should not clear. Information asymmetries may affect acquirers differently depending on distance to the target: Foreign acquirers often face significant uncertainties when entering foreign markets (Anderson and Gatignon, 1986; Clougherty and Zhang, 2020), and strengthened trade secret protection may increase information asymmetries more profoundly compared to domestic acquirers. Moreover, information asymmetries may affect ownership stakes in acquisitions (Falaster, Ferreira, and Li, 2021). Acquirers may seek to adjust the ownership stake they take in a target firm to mitigate increased information asymmetries or to pursue a stepwise acquisition of a target, consistent with a real options rationale (Malhotra and Gaur, 2013; Ouimet, 2013). In sum, it is unclear how an institutional change that reduces the ability to hire in labor markets may affect the behavior of firms in other strategic factor markets, such as the market for corporate control.

Assessing the effect of strengthened trade secret protection on firm acquisitions is empirically challenging. By their very nature, trade secrets are difficult to observe, much unlike

patents that have frequently been used as observable indicators of firms' technology base and research capabilities (Henderson and Cockburn, 1994). Nevertheless, prior research estimates trade secrets to comprise on average two-thirds of the value of firms' intangible assets, amounting to a total value of about $5 trillion in publicly-listed U.S. firms (Almeling, 2012; Kim, Linton, and Semanik, 2016). We use the enactment of the Uniform Trade Secrets Act (UTSA) during the 1980s, 1990s and 2000s by states in the U.S. (Castellaneta *et al.*, 2017; Png, 2017a) to identify the effect of strengthened trade secret protection on firms' likelihood of being acquired. In the U.S., trade secret protection is governed by state law and the UTSA strengthens the protection of trade secrets in two ways (Pooley, 1997). First, the UTSA extends the definition of trade secrets to incorporate non-business related inventions and those that are not in continuous use. Second, the UTSA declares the mere acquisition of a trade secret as misappropriation. Before the UTSA, U.S. states had legislation in place that offered different degrees of trade secret protection. Moreover, the states adopted the UTSA at different points in time, independent of state economic conditions or firm lobbying efforts (Png, 2017a, b; Castellaneta *et al.*, 2017). We thus exploit the exogenous variation in the timing of the adoption of the UTSA in the various states in our empirical analysis.

Using a firm panel for the period from 1980 to 2010, our results show that the enactment of the UTSA increased the likelihood of a firm of being acquired per year by 5.8% on average. We also find that strengthened trade secret protection affects acquirers differently. Foreign acquirers are less likely to take majority control over a target when trade secret protection increases while they are more likely to acquire minority stakes. We observe the opposite pattern for domestic acquirers. Both domestic and foreign acquirers are more likely to pursue stepwise acquisitions of a target. Exploring the mechanism for these effects points to information asymmetries as a

function of distance which seem to increase disproportionately for foreign acquirers but also for domestic acquirers further away from a target. Our reasoning is informed by a series of semi-structured interviews with acquisition managers and consultants who provide insights into firm decision-making on acquisitions.[1]

The contribution of our research to the extant literature is twofold. First, we extend a recent stream of research that investigates how changes in the institutional framework governing strategic factor markets affect firm behavior, and, more specifically, how a legal change can affect the attractiveness of a particular strategic factor market (e.g., Png and Samila, 2015; Contigiani *et al.*, 2018; Chen *et al.*, 2021). While strengthened trade secret protection intends to protect firms' competitive advantage by sanctioning the misappropriation of trade secrets that primarily occurs through employee mobility (Castellaneta *et al.*, 2017) and to provide incentives to invest in R&D (Png, 2017a), we show that firms revert to the market for corporate control as labor markets dry up, which is suggestive of a substitute relationship between different strategic factor markets as a consequence of institutional change. In that sense, we contribute new evidence that institutional change can have consequences both intended and unintended by policymakers (e.g., Eberhart, Eesley, and Eisenhardt, 2017; Castellaneta, Conti, and Kacperczyk, 2020).

Second, we contribute to the literature on cross-border acquisitions (e.g., Clougherty and Zhang, 2020; Falaster *et al.*, 2021) by documenting heterogeneous effects for domestic and foreign acquirers as well as differences in acquisition strategies after the institutional change which we attribute to relative informational disadvantages for foreign acquirers. Compared with

[1] Specifically, we interviewed two M&A managers working at a large multinational technology company and at an energy company, two M&A consultants from a global consulting firm, and one financial adviser on M&A deals from a multinational bank, all with considerable experience in M&A transactions. The interviews lasted between 30 minutes and one hour.

domestic acquirers, information asymmetries between a foreign acquirer and a potential target firm are likely to be larger when trade secrets become better protected, corroborating earlier research which finds foreign acquirers to suffer considerable uncertainty when entering foreign markets (Anderson and Gatignon, 1986). In that sense, we identify trade secret protection as a new mechanism that explains how information asymmetries influence the acquisition strategies of firms when they seek to enter foreign markets. By increasing information asymmetries, strengthened trade secret protection decreases the ownership share that foreign acquirers seek to hold, making the acquisition of minority stakes much more likely than majority acquisitions. Hence, trade secret protection interacts with foreign direct investment (FDI) policies, which complicates decision-making on cross-border acquisitions.

THEORETICAL BACKGROUND

Trade secrets and their protection through the UTSA

Keeping valuable knowledge and technology secret from rivals has been a frequently used strategy by firms in order to avoid misappropriation (Kogut and Zander, 1992; Arundel, 2001). In fact, prior research finds that such trade secrets, which include a multitude of intangible assets (Risch, 2007), are typically more effective instruments for appropriating the returns from innovation than patents (e.g., Levin *et al.*, 1987; Cohen *et al.*, 2000). While patents grant temporary legal protection against exploitation of the patented invention by third parties, they require the invention to be disclosed (Markman, Espina, and Phan, 2004). Disclosure can be costly because the information contained in patent documents is detailed enough to allow a person "skilled in the art" to understand the patented technology, re-engineer the invention and potentially "invent around" it (Arundel, 2001). Although prior research shows that as much as

90% of all inventions are not patented (Fontana *et al.*, 2013), patents oftentimes serve as important instruments to protect against competition and to secure freedom to operate in R&D (Teece, 1986; Lepak, Smith, and Taylor, 2007; Somaya, 2012).

In contrast to patents, trade secrets, by definition, do not require disclosure and can, in theory, last for an unlimited period of time. According to the UTSA, trade secrets refer to "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, or readily ascertainable by proper means by other persons who might 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" (Section 1(4) of the UTSA). In that sense, trade secrets are much broader in scope than patents, encompassing work in progress and inventions that do not fulfill the patentability requirements (Liebeskind, 1997; Wadhwa, Bodas Freitas, and Sarkar, 2017). Inventions are patentable when they are novel, have industrial applicability and involve an inventive step vis-à-vis the state of the art (Arundel, 2001). This excludes a great deal of valuable information such as business models, marketing concepts or customer lists, which in turn may be protected by trade secrets (Png, 2017a).

In the United States, which is our empirical context, trade secret protection – historically governed by common law – has increased considerably with the enactment of statutes based on the Uniform Trade Secret Act in 48 U.S. states as well as in the District of Columbia, Puerto Rico, and the U.S. Virgin Islands between 1975 and 2020. To qualify for protection, the information in question must (i) not be generally known or readily ascertainable, (ii) derive economic value from not being generally known, and (iii) be subject to significant efforts to maintain its secrecy (Sandeen, 2010). The UTSA strengthens the protection of trade secrets by

eliminating the requirement that the information be in continuous use and business related. Moreover, the UTSA extends the definition of misappropriation to include the mere acquisition of the secret by improper means, which include industrial espionage, fraud, bribery, or violations of confidentiality and usage agreements (Lemley, 2008). In those cases, the UTSA provides a framework for procedures and remedies, such as regulation on a maximum period of three years between misappropriation and legal action and substantive punishment for misappropriation (injunctions long enough to eliminate any advantage from misappropriation and punitive damages up to twice the amount of the actual damage) (Sandeen, 2010). The introduction (and widespread adoption) of the UTSA has since made the application of trade secret law more consistent across U.S. states (Almeling, 2012).

Besides the UTSA, the institutional framework governing trade secret protection in a state may also include court recognition of the Inevitable Disclosure Doctrine (IDD). This doctrine stipulates that firms may obtain an injunction to prevent former or current employees from taking up employment at another firm that would inevitably lead them to disclose trade secrets (Png and Samila, 2015). The IDD can be invoked when a firm perceives a misappropriation risk because an employee with trade secret information may be employed in a similar position at a rival firm. The IDD has been recognized by courts in only 21 states compared to almost all states and jurisdictions that have codified the UTSA (Klasa *et al.*, 2018).[2]

Moreover, firms may protect their trade secrets through covenants not to compete (CNCs). Contractually limiting the opportunities of former employees to work for competitors within a specified geographical distance and time period (Garmaise, 2011), CNCs curtail other firms' opportunities to benefit from spillovers through hiring scientists and engineers on labor markets

[2] The UTSA has not been adopted by the states of North Carolina and New York whose own legislation, however, is very similar to the act (Klasa *et al.*, 2018).

(Marx, Strumsky, and Fleming, 2009). CNCs are frequently used by firms in the U.S. and the degree to which CNCs can be enforced by law varies by state (Garmaise, 2011). CNCs are, for instance, not enforced in California, whereas Florida shows a high enforceability from 1997 onwards (Ertimur et al., 2018). In contrast to trade secret law, CNCs are contractual provisions that can be enforced if they serve to protect a firm's trade secrets, which makes their effectiveness partly dependent on the corresponding laws (Png, 2017a).

In that sense, investigating the effect of strengthened trade secret protection through the UTSA would be incomplete if other relevant legal mechanisms were not considered, such as court recognition of the IDD or the enforceability of CNCs. While the IDD provides greater protection against misappropriation than employment contracts with CNCs, for example regarding the applicable geographic scope or the ability of courts to grant an injunction (Klasa *et al.*, 2018), legal scholars argue that the UTSA is an efficient substitute for contractual restrictions in trade secret protection (Wang, 2020). It deters wrongful acts by employees, avoids overinvestment in trade secret protection by firms, and alleviates the burden to frequently sue for CNCs. With the UTSA, firms can rely on trade secret law when courts hesitate to enforce contractual restrictions on employees. In addition, the application of the IDD in trade secret protection is controversial and inconsistent in some states (Wang, 2020). Hence, while the combination of UTSA, IDD, and CNCs creates multiple layers of defense against trade secret misappropriation, the adoption of the UTSA by a state significantly increases the degree of protection that a firm's trade secrets in that state enjoy (Png, 2017a).

Trade secrets and firms' engagement on the market for corporate control

Gaining access to knowledge and technology has often been cited as a major motivation for firm acquisitions as firms seek to benefit from complementary resources to improve their innovation

performance (e.g., Cassiman *et al.*, 2005; Chondrakis, 2016). In that regard, both disembodied and embodied knowledge and technology may be valuable resources that firms seek to acquire on the market for corporate control. Prior literature has primarily focused on patents which not only allow firms to learn but also to protect their intellectual assets from misappropriation. Grimpe and Hussinger (2014), for example, show that acquiring patent portfolios with high "blocking power" can be complementary to an acquiring firm's resources as they increase the degree to which an acquiring firm may appropriate the value from its innovation activities. Such "pre-emptive patents" secure a firm's freedom to operate in R&D by threatening the patenting activities of rivals.

Trade secrets are broader in their coverage than patents and frequently embodied in the target firm's employees, and acquirers may pursue an acquisition to get access to skilled and experienced human capital (Chen *et al.*, 2021; Kim, 2023). For example, R&D processes often build on experience (Cohen and Levinthal, 1989) or learning-by-doing (Teece, 1986), and thus feature a substantial share of tacit knowledge embodied in scientists and engineers, which is difficult to transfer independently of the individuals holding it (Winter, 1987). Prior research suggests several reasons why strengthened protection of trade secrets may increase a firm's likelihood of being acquired. Strengthened protection increases the value of a target firm's trade secrets because it increases the target's competitive position in product markets (Chen *et al.*, 2021). It may limit the outward flow of information about trade secrets to competitors and thus lessen the risk of misappropriation and imitation (Png and Samila, 2015; Contigiani *et al.*, 2018). Key personnel is less likely to leave an acquired firm if increased trade secret protection constrains their outside options (Chen *et al.*, 2021). In fact, acquiring firms oftentimes struggle to retain such individuals after an acquisition, leading to a productivity loss in innovation activities

(Paruchuri, Nerkar, and Hambrick, 2006; Ng and Stuart, 2022;). At the same time, strengthened trade secret protection limits firms' ability to hire key employees on the labor market (Png and Samila, 2015; Castellaneta et al., 2017), and acquisitions may serve as an instrument to "acqui-hire" such personnel (Kim, 2023). In an interview, the M&A manager of a Dutch technology company confirmed that trade secrets play an important role in firm acquisitions:

> *Trade secrets are a key motivation. You want to get access to the knowledge that resides in the people. There are only a few teams in the world that could help us develop this product. So, you want this company; you want to acquire it.*

The manager of an energy provider in Luxembourg confirms this perspective:

> *We are currently in the process of extending our activity portfolio, moving from just supplying the electricity to having the competence for how to set up the grid so that everybody in a neighborhood can charge their electric car. What kind of technology, what kind of software do you need for that? That knowledge is not easy to patent. So, we look for a company where people have such knowledge and skills because we want to have that in house. Then we can also easily offer that solution in other markets.*

However, in comparison to an observable portfolio of patents, strengthened trade secret protection may also complicate the identification and appraisal of valuable trade secrets in potential target firms. It is well known that the market for corporate control is fraught with information frictions and valuation challenges (Chondrakis, Serrano, and Ziedonis, 2021). Information asymmetries between potential acquiring and target firms may give rise to adverse selection problems (Akerlof, 1970; Reuer and Ragozzino, 2008). While target firms are typically better informed about their own knowledge, technology and assets, acquirers find it hard to determine the value of the resources to be acquired (Coff, 1999). Target firms may be reluctant to disclose information constituting a trade secret to potential acquirers during the due diligence phase since trade secrets are vulnerable to misappropriation in case the transaction does not close (Castellaneta *et al.*, 2017). In fact, Aggarwal and Hsu (2014) find that the diffusion of confidential information during the acquisition process can harm inventive output. The

information asymmetries that such reluctance creates between acquirer and potential target firm are likely aggravated with strengthened trade secret protection. Castellaneta et al. (2017) show that strengthened trade secret protection may lead acquirers to discount their offer, particularly when the value of the target's resources is uncertain and the target operates in a risky industry. Then again, strengthened trade secret protection may also facilitate an acquisition as targets may be more willing to disclose trade secrets if they can better enforce them in case the acquisition should not close.

The role of distance between acquirers and targets

In the following, we suggest that there is heterogeneity in the effects of strengthened trade secret protection on both the type of acquirer and acquisition strategy as a function of distance. In that sense, prior research on cross-border acquisitions would lead us to believe that foreign acquirers may be disproportionately affected by increasing information asymmetries when they seek to identify and assess potential target firms (e.g., Meyer *et al.*, 2009; Malhotra and Gaur, 2013). Foreign acquirers need to interpret information in the light of the legal provisions in a host country that they have less experience with compared to domestic firms (Gehrig, 1993). As domestic acquirers are better able to assess the relevant implications of legal trade secret protection than foreign acquirers, the latter may overestimate the risks and underestimate the benefits of acquiring a host-country target (Liesch, Welch, and Buckley, 2011). Foreign acquirers also face higher transaction costs that they need to take into account when deciding on a cross-border acquisition, both because legal provisions in a host country create costs (e.g., legal and advisory fees) and because acquirers face organizational costs that arise from building legal expertise and allocating management attention (Boeh, 2011; Clougherty and Zhang, 2020).

Comparing their experiences with domestic and foreign acquisitions, the manager of the Dutch technology company remarked:

> *Even though we have people from the U.S. in our top management, you are entering into the unknown. When we bought that U.S. firm, the amount of legal work we had to do was surprising. We had to work with different legal advisors than we used to work with in Europe. It really does scare you.*

Strengthened trade secret protection and associated information asymmetries are likely experienced differently by foreign acquirer managers compared to domestic firm managers as the former perceive a lower sense of control and mastery of a particular domain (Liesch et al., 2011). As a result, higher perceived risk as a function of available information and prior experience may deter foreign acquirers from pursuing an acquisition to a larger extent than domestic acquirers (Clougherty and Zhang, 2020).

Moreover, strengthened trade secret protection may affect the acquisition strategy pursued by acquiring firms, i.e., the decision to take a majority or minority stake in a target firm. While the acquisition of a majority stake is typically a large event involving operational and organizational changes in both the target and acquiring firm, minority stake acquisitions in which an acquirer takes less than 50% of the target are a distinct organizational choice (Ouimet, 2013). Firms frequently acquire minority stakes, also referred to as block equity positions, to benefit from the resources and profitability of another firm without obtaining control (Allen and Phillips, 2000). In these transactions, acquiring and target firms often agree to share knowledge and technology or to jointly develop products, making minority stake acquisitions similar to strategic alliances. As a consequence, they may offer efficiency benefits because they mitigate holdup costs and market frictions and encourage relationship-specific investment which in turn lowers contracting and monitoring costs (Nain and Wang, 2018). The manager of the energy provider remarked:

> *When we take a minority stake, we want to learn about a specific technology, how it might develop in the near future, and what the company's competences are. We always take a seat on the board.*

Prior research highlights that acquirers can alleviate the problem of adverse selection by choosing shared ownership structures that incentivize the target firm's management to reveal accurate information and to facilitate cooperation after the acquisition (Malhotra and Gaur, 2013; Ouimet, 2013). Hence, acquisitions of minority stakes are more common when merger gains are more uncertain because they enable the flow of information between the firms, providing the acquirer with a better assessment of the value of the target and the expected synergies before it decides to purchase a higher or even a majority stake. Yet, despite the benefits that minority stake acquisitions offer, they do not grant an acquirer full control over a target which may potentially allow the acquirer to realize additional efficiency gains and fully benefit from the target's knowledge, technology, and assets, as in the case of majority stake acquisitions. In fact, accessing information or monitoring the operational activities of the target can be more difficult for a minority owner. A minority acquisition can hence just be a way to get a "window" on the knowledge and technology of a target firm before further action is taken. The M&A consultant of a U.S. consulting firm told us:

> *You do it when the local management wants to divest part of the equity, maybe because they want to capitalize a bit on the value they have created, but the management is still a critical part of the business. That is not active ownership [by the acquiring firm]. You keep them to align interests. But you cannot change the management either.*

In that sense, strengthened trade secret protection may influence whether acquirers choose to engage in minority acquisitions as part of a real options strategy. When the motivation for a minority stake is based on learning, firms can use minority positions to get access to information about the target and to better judge the benefits of increasing the ownership stake (Ouimet, 2013). Acquiring firms can use minority acquisitions as a means of obtaining growth options

(Kogut, 1991), defined as the future growth opportunities of a firm where the value of growth options refers to the proportion of the firm value that concerns future growth opportunities rather than the current assets (Brealey and Myers, 2000). Since uncertainty increases the value of growth options, minority acquisitions are more likely to be motivated by a real options reasoning when acquirers associate greater uncertainty with a specific target (Tong, Reuer, and Peng, 2008). Acquirers can reduce downside losses by taking a limited initial stake in a target, creating a growth option that allows the acquirer to expand ownership if uncertainty about the target's knowledge, technology, and assets resolves in a favorable way (Kogut, 1991). While minority acquisitions could therefore be motivated by a real options strategy, the M&A manager of the Luxembourg-based energy provider believed that such an approach was relatively rare:

> *When you have a firm in an industry undergoing technological change, such as the energy sector transitioning from fossil fuels to all kinds of other things, so when you need to redeploy your assets but don't really know how, then those stepwise acquisitions make a lot of sense. But they don't happen very often.*

Since domestic and foreign acquirers are likely affected by strengthened trade secret protection in different ways, they may also make use of acquisition strategies differently. In that sense, foreign acquirers may refrain from the acquisition of a majority ownership stake in the target relative to domestic acquirers but rather pursue acquisitions of minority ownership stakes. The ownership stake that acquirers pursue determines their exposure in the host country (Henisz, 2000), control of local operations (Chen, 2008; Lahiri, Elango, and Kundu, 2014), and access to proprietary knowledge (Anderson and Gatignon, 1986; Malhotra and Gaur, 2013). Foreign acquirers face liabilities of foreignness as a result of unfamiliarity with the local environment and institutional framework (Mezias, 2002; Falaster *et al.*, 2021). Taking a minority stake in a target firm and hence engaging in a partnership rather than a majority acquisition can help to reduce information asymmetries and to compensate for the increased risk that foreign acquirers may

face with strengthened trade secret protection to a higher extent than domestic acquirers. Makino and Delios (1996) suggest that partial ownership of local partners helps to overcome unfamiliarity hazards in the local host-country environment that increase with distance, complicating the assessment of the target's value ex-ante and its management ex-post (Malhotra and Gaur, 2013).

In sum, while the main effect of strengthened trade secret protection on firm acquisitions is ambiguous, we expect domestic and foreign acquirers to be differentially affected by the institutional change based on the extent to which acquirers associate uncertainty with the acquisition of a target. The information asymmetry between acquirer and target then likely affects the acquisition strategy chosen.

DATA, MEASURES, AND METHODS

Data

Our analysis is based on a firm-year panel dataset that combines different data sources. Firm acquisition data was extracted from the database Thomson One Banker of Thomson Reuters. We consider only transactions that were completed and involved target firms in the U.S. We focus on individual acquirers only that acquire stakes of individual targets, excluding 20 syndicate acquisitions. If an acquirer purchases several equity stakes of the same firm, we sum up the final stake to determine whether an acquisition was a minority or a majority acquisition and we use the first acquisition date as the date at which the acquisition enters our sample. We provide further evidence on these stepwise acquisitions in the results section. Our sample spans the period 1980-2010 and includes all industries (Table A1 in the appendix).

We combine the firm acquisition data with information on target firms' characteristics using Compustat.[3] Data on firms' patents are taken from Kogan *et al.* (2017). All firms in our sample are publicly listed. This choice is not unrelated to the importance of trade secret protection as the acquisition of private firms presumably entails higher information asymmetries compared to publicly listed firms. We obtain data on state-level trade secret protection through the UTSA from Png (2017b). Firms are matched to states based on the location of the firm's headquarters obtained from Compustat, considering trade secret protection in that state.[4] Furthermore, we add data on the enforceability of noncompete agreements at the state level from Garmaise (2011) and Ertimur *et al.* (2018), data on state court recognition of the IDD from Klasa *et al.* (2018), and data on the existence of business combination laws from Giroud and Mueller (2010) as well as Chen *et al.* (2021). Finally, we also include data on the state GDP growth rate, obtained from the Bureau of Economic Analysis.

In order to ensure that the sample composition does not change from the pre- to the post-period, for example in terms of industry and state composition, we follow recent literature and require that firms in our sample be observed at least once before and at least once after the UTSA (e.g., Dube and Zhu, 2021). Our control group consists of firms that were never treated, i.e. firms located in states that never enacted the UTSA in any form. We define the time window for these

[3] The match relies on firm identifiers (CUSIP and PERMNO, from the Center for Research in Security Prices (CRSP) database).

[4] For most firms R&D facilities, where many trade secrets are held, are collocated with the headquarters (Malecki, 1980). For some firms, the location of the R&D and the firm's headquarters may indeed not coincide. Such a discrepancy is unlikely to affect results (Li, Lin, and Zhang, 2018) which we believe to hold in our context for four reasons. First, trade secrets coverage goes beyond R&D outcomes, including marketing or technical data and manufacturing expertise. These are likely located at the firm's headquarters. Even if not, accounting for the firm's R&D location would not allow to trace the location of those trade secrets. Second, when selecting the state's law that governs a dispute, courts often favor the state with the most significant relation to the dispute which typically is the headquarters' location (Jones, 2014). Third, the headquarters' state is relevant because of "the law of the place where the contract is made" principle in labor laws (Pollard, 2014). Fourth, firms can designate the law of the headquarters' state as the applicable law using either the "choice of law provision" in employment contracts (Steinmeyer and Freeman, 2016) or the "choice of forum provision" (Jones, 2014). Hence, we are confident that the matching of firms to their headquarters' state is appropriate.

firms around a randomly drawn placebo event year. The distribution of these placebo years corresponds to the actual years in which the UTSA was enacted (see Table A2 in the Appendix). We use a 13-years window for our main results since earlier and later years should not be of relevance for our event, again following recent literature (e.g., Cunningham and Goodman-Bacon, 2024). Moreover, the 13-years window ensures that our analysis is not confounded by the Defend Trade Secrets Act (DTSA), passed in 2016, which provides a federal civil remedy for trade secret misappropriation (Wang, 2023). We show robustness for no time window at all (Table A3) and different time windows (Table A4). Lastly, we use coarsened exact matching (Iacus *et al.*, 2012) in the year prior to the event to make sure that treated and untreated firms are comparable in terms of their 2-digit SIC industry affiliation, total assets and R&D intensity where we use three equally sized classes of the latter two variables for the matching. The matching should mitigate concerns that the results might be driven by differences between treated and control firms occurring in the pre-treatment period (e.g., Flammer, 2015; Flammer and Kacperczyk, 2016). Our final sample consists of 23,391 firm-year observations of all publicly listed firms for which we could retrieve information from all the different sources for the years from 1980 to 2010. These include the target firms involved in the 626 acquisitions, i.e. unique target-acquirer combinations. Once a firm is acquired, it is dropped from the sample.

Measures

Dependent variables

Our model focuses on acquisitions and distinguishes acquisitions according to the origin of the acquirer (domestic vs foreign) and the ownership stake (minority vs majority).[5] Similar to recent

[5] M&A databases typically do not indicate whether an acquisition could be considered a "merger of equals", but they always designate one firm the role of the acquirer and another the role of the target, indicating the stake acquired. In fact, prior research has questioned whether a true merger of equals exists. Based on the definition that a

studies on firm acquisitions (e.g., Chen et al., 2021; Chondrakis et al., 2021), we employ a set of dependent binary variables, starting with any type of acquisition and then moving to more specific types of acquisitions: (1) any acquisition, (2) domestic acquisition, (3) foreign acquisition, (4) domestic majority acquisition, (5) foreign majority acquisition, (6) domestic minority acquisition, and (7) foreign minority acquisition. Foreign (domestic) acquisitions are those in which the acquiring firm is located outside (inside) the U.S. Minority (majority) acquisitions are those where a stake of less than (at least) 50% is acquired (Ouimet, 2013). For each of these dependent variables, the dummy variable is equal to one if a firm has been subject to that particular type of acquisition and zero if it has not been acquired.

Explanatory variables

We use the timing of the state-wise adoption of the UTSA following Png (2017b), which identifies the year of enactment of the UTSA across U.S. states during the period from 1980 to 2010 (see Table A2 in the Appendix). Our main independent variable (post-UTSA) is a binary variable that takes the value one for the years following the enactment of the UTSA in the respective state.

We include several variables measuring target firm characteristics that might affect the likelihood of being acquired. We measure firm size as the firm's total assets and take the logarithm to account for the skewness of the distribution of this variable. We include a firm's sales growth as the percentage change of sales from the previous period. Moreover, we include R&D expenditures as the ratio of R&D expenditures to firm assets. We replace missing expenditures data by zero and include a dummy variable recording these missing values. We

merger of equals entails an approximately equal value contribution from both firms to the merged entity, less than 0.05% (0.10%) of all transactions from 1985 to 2001 in Europe (the U.S.) could be classified as mergers of equals (Zaheer, Schomaker, and Genc, 2003). The label "merger of equals" is rather used to communicate the transaction to anxious stakeholders, particularly the employees of the "weaker" partner.

include the ratio of firms' patent stock over R&D expenditures. We construct the patent stock using granted patents in the year of application with a depreciation rate of 15%. We include the ratio of firms' citation stock over the patent stock to measure patent portfolio "quality" with a depreciation rate of 15%. Moreover, we control for the acquirers' engagement in co-patenting, which we measure as the co-patent stock over the patent stock. This variable accounts for the acquirers' engagement in alliance activities as an alternative channel to access another firm's trade secrets.

We also include a set of state-level control variables. We measure the recognition of the IDD with an indicator variable developed by Klasa *et al.* (2018). The indicator takes a value of one in the year of the recognition of the IDD in a specific state and in the years thereafter, and zero otherwise. The enforceability of CNCs is measured using an index on the state-year level developed by Garmaise (2011) that captures the degree of enforceability of non-compete agreements for the period 1992-2004. The index has been extended by Ertimur *et al.* (2018) to cover the years 1980-2013 and ranges between 0 to 12, with higher scores indicating higher enforceability of CNCs.[6] We include an indicator variable to reflect whether a state has adopted business combination laws. Business combination laws enforce a moratorium on transactions such as M&As for a period of three to five years. We employ the indicator developed by Giroud and Mueller (2010) and extended by Chen *et al.* (2021), which equals one if a state has adopted business combination laws and zero otherwise. Finally, we control for state economic conditions that may influence the extent to which firm acquisitions occur. We include a state's GDP growth

[6] The index is constructed based on a survey of the state laws surrounding CNCs (Malsberger, 2004). A total of twelve questions (e.g. burden of proof, geographic restrictions, and damages) is used to evaluate CNC enforceability.

rate as more prosperous states may exhibit higher acquisition activity. Table 1 provides a description of our variables.

[Insert Table 1 about here]

Empirical approach

Our identification strategy exploits differences in the timing of the UTSA coming into effect in the various states (Castellaneta et al., 2017; Png, 2017a, b). Our empirical setup is that of a standard staggered difference-in-difference (DiD) analysis with a treatment, the UTSA, that occurs at different points in time in different U.S. states (Baker, Larcker, and Wang, 2022). Following Cengiz et al. (2019), we estimate stacked regressions. For this, we reorganize our data per state around the year of the enactment of the UTSA. For each state that was subject to the UTSA, we create a time window of 13 years around the event (similarly for the control observations with the randomly assigned event years) and stack these datasets together. This implies that the time dimension in years of the stacked dataset takes values from -6 to 6 with the UTSA being enacted at time 0. We define a binary variable that takes the value one after the UTSA has been implemented, i.e. for the years 1 to 6. Following Chen et al. (2021) and Chondrakis *et al.* (2021), we employ linear fixed-effects regressions for the acquisition decision that account for unobserved firm- and industry-specific fixed effects (Wooldridge, 2007). We use clustered standard errors by state as our treatment is defined at the state level (Bertrand, Duflo, and Mullainathan, 2004). Following Baker *et al.* (2022), we estimate the stacked models with and without time-varying firm- and state-level covariates for each dependent variable:

$$Acquisition_{i,s,t} = \alpha + \beta_1 * post\_UTSA_{s,t} + \beta_2 * Firm\ characteristics_{i,s,t} + \beta_3 * State\ characteristics_{s,t} + Firm\ FE + \varepsilon_{i,s,t} \quad (1)$$

where *i* indicates the firm, *t* the year and *s* the state respectively. *Firm FE* depict time-invariant firm specific effects. β_1 is the coefficient of interest that shows the effect of the enactment of the UTSA on the dependent variable. $Acquisition_{i,s,t}$ depicts our five different dependent variables.

Parallel trends

Like standard DiD analysis, staggered DiD treatment analysis requires parallel trends of the dependent variable prior to the treatment. Following Marcus and Sant'Anna (2021) and Roth (2022), we plot event study graphs based on fixed effects regressions for the 13-years window which include our set of firm control variables and the year dummies which define the distance to the enactment of the UTSA. Figures A1 to A7 in the Appendix present the estimated effects. The pre-treatment trends are not significantly different from zero for all years prior to the UTSA. Table A5 in the Appendix shows the estimated coefficients. They are insignificant for the years prior to the UTSA for all dependent variables which leads us to conclude that the parallel trends requirement is fulfilled.

RESULTS

Descriptive statistics

Tables 2 and 3 show descriptive statistics and a comparison of means (before and after the enactment of the UTSA) of the variables of interest. Pairwise correlations can be found in the Appendix in Table A6. The average probability for a firm to be acquired is 0.027. The probability of being acquired before the enactment of the UTSA is significantly smaller (0.019) than afterwards (0.053). The firms in our sample have an average of $2,175 million in total assets (equivalent to 4.749 in log units), average sales growth of 0.657 and an average R&D expenditure to assets ratio of 0.03 (which corresponds to average R&D expenditures of $10.45

million). They have an average patent stock of 1.22 and a citation stock of 7.76. Further, 39.3% of the firms are located in states that recognize the IDD, and 41.4% in states that have adopted business combination laws. The average value of the CNC enforceability index is 4.39. Finally, firms in our sample are located in states that have an average GDP growth of 6.81%.

[Insert Tables 2 and 3 about here]

Main results

Table 4 shows the results of the main regressions for the probability of being acquired, in which only the post-UTSA variable is included. The first column shows the results for all acquisitions. The estimated coefficient is significant and shows that the enactment of the UTSA increases the likelihood of being acquired. The marginal effect is 0.058, which indicates that if a state enacts the UTSA, the probability of a firm located in that state of being acquired increases by 5.8%. The second and third columns show the results for domestic and foreign acquisitions, respectively.[7] The results show a positive and significant effect of the post-UTSA variable. The marginal effect for domestic acquisitions is 0.039 while it is 0.021 for foreign acquisitions, indicating that the probability of a firm located in a state that enacts the UTSA of being acquired by a domestic acquirer increases by 3.9% while it only increases by 2.1% for foreign acquirers, almost half the probability. The fourth to seventh columns show the model for acquisitions depending on the stake of ownership and origin of the acquirer. Here, we also find a positive and significant coefficient of the post-UTSA variable. The marginal effect for domestic majority acquisitions is 0.027. For foreign majority acquisitions it is 0.006, 4.5 times smaller. That is, the probability of a firm located in a state that enacts the UTSA of being acquired in a majority deal by a domestic

[7] Note that we exclude other types of acquisitions when we focus on a specific type of acquisition in our dependent variable, e.g. we drop observations for majority acquisitions when our dependent variable depicts minority acquisitions. Hence, the number of observations is different in each column.

and foreign acquirer will increase by 2.7% and 0.6%, respectively. For minority acquisitions, the marginal effect for domestic minority acquisitions is 0.013 while for foreign minority acquisitions it is 0.015, 15% higher. This means that the probability of a firm located in a state that enacts the UTSA of being acquired in a minority deal by a foreign acquirer will increase by 1.5%, while the likelihood of being acquired by a domestic acquirer increases by 1.3%.[8] This finding suggests that domestic and foreign acquirers are indeed differentially impacted: strengthened trade secret protection has a much stronger effect on domestic acquirers than on foreign acquirers, and it leads domestic acquirers comparatively more to engage in a majority acquisition than in a minority acquisition while it is the other way around for foreign acquirers. Table 5 shows the results for regressions that include a full set of firm-level and state-level covariates. The magnitude, sign and coefficients of the post-UTSA variable are in line with the findings of Table 4.

[Insert Tables 4 and 5 about here]

The role of distance in acquisition decisions

Our results indicate differential effects of the UTSA on the type of acquirer and acquisition. To further investigate whether the UTSA increases information asymmetries as a function of distance between the acquirer and target firm, we re-estimate our models focusing on the sub-samples of firms that underwent a domestic and foreign acquisition. For domestic acquisitions, we distinguish between acquirers and targets that are located in the same (neighboring) state and those that are not. Table 6 (Table A7) shows that acquirers are almost equally likely to acquire

[8] The estimated coefficients are significantly different for domestic and foreign acquisitions (F = 27.60***), domestic and foreign majority acquisitions (F = 284.19***), domestic majority and domestic minority acquisitions (F = 57.54***), and foreign majority and foreign minority acquisitions (F = 6.49**). The difference between domestic and foreign minority acquisitions is not statistically significant (F = 0.41).

targets located in the same or another state, but they are more likely to engage in a majority acquisition than when they are located in a different state, in which case they are much more likely to engage in a minority acquisition. For acquirers and targets located in the same state, the enactment of the UTSA does not have a significant effect on minority acquisitions. These results are in line with the notion that asymmetric information is a less strong impediment for the acquisition of a majority stake in a target firm when it is located close by.

For foreign acquisitions, we focus on the institutional distance between the acquirer's nation and the U.S., defined as the extent of similarity or difference between the two countries in their broad institutional environment (Lahiri *et al.*, 2014). We follow Lahiri *et al.* (2014) who employ data from the World Bank's six Governance Indicators (WGI)[9] to compute the mean distance between the two countries.[10] Table 7 shows that the likelihood of getting acquired in a minority acquisition by a foreign firm is considerably higher when the institutional distance is larger than the sample median. We do not observe any significant effects for majority acquisitions by foreign firms. We find a similar pattern when we consider institutional distance lower than the 33% percentile and greater than the 66% percentile (Table A8). In that sense, the UTSA only has an effect on minority acquisitions by foreign firms that they revert to when institutional distance is high. Again, these results provide suggestive evidence of information asymmetries due to the enactment of the UTSA increasing with distance, leading foreign firms to engage in minority stake acquisitions.

[Insert Tables 6 and 7 about here]

[9] The WGI are composed of the following dimensions: Voice and Accountability, Political Stability and Absence of Violence/Terrorism, Government Effectiveness, Regulatory Quality, Rule of Law, and Control of Corruption.

[10] We employ the following formula: $ID_j = \sqrt{\sum_{i=1}^{6}(I_{ij} - I_{iU})^2}$, where ID_j is the institutional distance for the *i*-th country, I_{ij} is the WGI's score for the *i*-th governance dimension for the *j*-th country, and U indicates the U.S.

Stepwise acquisitions and real options reasoning

Next, we investigate whether increasing trade secret protection affects the sequence of ownership stakes in acquisitions. After the UTSA, acquirers may seek to mitigate increased information asymmetries by buying repeatedly small stakes of the same target, consistent with a real options strategy (Malhotra and Gaur, 2013; Ouimet, 2013). We identify all stepwise acquisitions in the acquisition database, i.e. where an acquirer repeatedly purchases stakes of the same target firm with the first stake lower than 50%. For 18% of all stepwise acquisitions, the acquirer eventually reaches a stake greater than 50%.[11]

Table 8 shows that 8.48% of the 3,607 acquisitions in the sample are stepwise acquisitions of the same acquirer and target with an initial stake of less than 50%. This corresponds to 6.80% domestic acquisitions and 1.68% foreign acquisitions, reflecting the prevalence of domestic acquisitions in the sample. When focusing on the number of domestic versus foreign acquisitions, we find that foreign acquirers are comparatively more engaged in stepwise acquisitions than domestic acquirers. Moreover, distinguishing between the pre- and post-UTSA period, we find that the percentage of stepwise acquisitions with an initial minority stake increases for domestic acquisitions from 6.36% to 8.59% and for foreign acquisitions from 9.57% to 10.05%.

[Insert Table 8 about here]

We also provide evidence for whether the UTSA leads domestic and foreign acquirers to pursue more or less acquisition steps. While Table A9 in the Appendix shows an increase in the number of steps for both, domestic and foreign acquirers after the UTSA, the differences are not

[11] Note that here we do not restrict the sample to the firms that were observed before and after the UTSA at least once and we do not restrict the sample to the matched firms only because both requirements were solely imposed for reasons of causal interpretation of our main results, while here we present descriptive evidence. We keep the 13 years' time window.

statistically significant. Thus, we cannot observe significant changes in the strategy towards stepwise acquisitions as a result of strengthened trade secret protection. When looking at the size of the stakes acquired in the different steps, Table A10 shows that the initial stakes acquired are on average rather small (about 12%) and do not differ between domestic and foreign acquirers ($p = 0.82$). Subsequent steps are rather small as well. However, we find that the stakes acquired before and after the UTSA differ significantly ($p = 0.00$) and become considerably smaller, which is driven by the subsample of domestic acquisitions ($p = 0.00$).[12]

In sum, stepwise acquisitions are more common among foreign acquirers, but they become more important for both, domestic and foreign acquirers, as a result of increased trade secret protection. In that sense, the results point to increasing information asymmetry with distance that some acquirers seek to mitigate by following a stepwise acquisition strategy.

Robustness checks

To check for robustness of our results, we run a set of alternative analyses. First, we run our analysis for California only (using the observations located in the not-yet treated states as control group) as California enacted the UTSA for a reason different than strengthening trade secret protection. As Png (2017a) notes, the apparent reason for enacting the UTSA was to increase the number of successful bills introduced by the senator, suggesting that the enactment was exogenous to the likelihood of acquisitions. The results in Table A13 in the Appendix are in line with our main findings. Second, we run a placebo test by keeping only the non-treated firms, i.e.

[12] Table A11 shows the results for stepwise acquisitions by domestic acquirers for which we distinguish between same/different and neighboring/non-neighboring state stepwise acquisitions. We find that the share of stepwise acquisitions increases markedly after the UTSA when the target is located in a different, neighboring or non-neighboring state, but not when acquirer and target are located in the same state. Table A12 shows the average number of steps for acquisitions with an initial minority stake. We find that, even though the average number of steps increases slightly for different and neighboring state acquisitions after the UTSA, the differences are not statistically significant.

those located in states that never enacted the UTSA. Among these, we randomly assign 17 placebo treatment years following the actual pattern of the UTSA (see Table A2) for 65% of the firms. The unassigned firms constitute the placebo control group. Table A14 in the Appendix shows that the placebo treatment does not impact the likelihood of any type of firm acquisition, increasing confidence that the effects for the actual treatment are causal. Third, to show that our results are not driven by the specific size of the chosen time window around the UTSA, we re-estimate the different models without any time windows (Table A3 in the Appendix) and using time windows of different sizes around the UTSA enactment (Table A4 in the Appendix). The results turn out to be fully consistent with the main results. Fourth, we re-estimate our models only including firms that are on the 25th percentile or lower in terms of size (as measured by assets) to minimize the noise that might be coming from larger firms with multiple R&D locations. The results (Table A15[13] in the Appendix) are in line with the main results. Fifth, we re-estimate the different specifications using alternative standard errors. We run our analysis employing (1) two-way clustered standard errors at the state and industry level (see Table A18 in the Appendix), and (2) clustered standard errors at the industry level (see Table A19 in the Appendix). Sixth, we re-estimate our models with the change in the effective legal protection due to the UTSA using the index variable proposed by Png (2017b) as opposed to the post-UTSA indicator variable. The results (Tables A20 and A21 in the Appendix) are in line with the main results. Seventh, we re-estimate our regressions on the sub-sample of states that were not subject to business combination laws which allows to isolate the effect of the UTSA on acquisitions. Foreign acquirers may be disproportionately affected by business combination laws because they may find it challenging to navigate the foreign legal provisions or because they are subject to

[13] Table A16 and A17 show the results for medium sized and large sample splits, respectively.

additional scrutiny, both in the U.S. (for example, by the Committee on Foreign Investment in the United States, CFIUS) and in their home country. The results, which are shown in Table A22 in the Appendix are in line with the main results in Table 5. Eighth, we re-estimate our model using the staggered imputation approach by Borusyak, Jaravel, and Spiess (2024).[14] The results, available from the authors upon request, show no pre-trend before the UTSA and a positive treatment effect on the treated afterwards, in line with our main results. Ninth, we run fixed effects stacked regressions for the unmatched full sample, including covariates (Tables A23 and A24 in the Appendix). Again, the results are consistent with our main findings. Finally, we remove three target firms from the matched involved in stepwise acquisitions. The results are unchanged.

DISCUSSION AND CONCLUSION

How does strengthened trade secret protection influence firms' engagement on the market for corporate control? Prior research that examines a firm's decision to acquire another firm in order to get access to knowledge and technology has largely focused on the role of patents, including the technological relatedness between the acquirer's and target's patent portfolios (e.g., Ahuja and Katila, 2001; Chondrakis, 2016) or the pre-emptive power of a target's patent portfolio (Grimpe and Hussinger, 2014). Although firms typically face the choice between patents and secrecy in order to protect their knowledge (Hall *et al.*, 2014), they are oftentimes complementary: "Patents and trade secrets are not incompatible but dovetail: the former can

[14] We estimate a two-way fixed effects model for the non-treated, in our case the never-treated, observations only. The predictions are then extrapolated to the treated observations, and the treatment effect for each treated observation is calculated as the observed outcome minus the predicted outcome from the first-stage regression for the non-treated observations and averaged for the sample of the treated firms. We allow for a one-year aspiration lag. Since this is an estimation using the non-treated observations only and the prediction therefrom is core to this approach, we include the firms that have been observed only before the law change in this regression and an otherwise unchanged sample.

protect patentable inventions, and the latter, the volumes of important, if not essential, collateral know-how" (Jorda, 2008: 1). Yet, trade secrets are, by definition, hard to observe, posing challenges for empirical research on the role and importance of trade secrets.

Our research extends a recent stream of literature which infers indirect evidence from legal changes in the strength of trade secret protection to learn about the importance of trade secrets for firms' decision making (Castellaneta *et al.*, 2017; Png, 2017a, b; Contigiani *et al.*, 2018). Following this approach, our results show that trade secrets play an important role for firms' decision to engage in the market for corporate control. Trade secrets are often ingrained within the employees of the company being targeted for acquisition (Chen *et al.*, 2021), and the acquisition may allow to gain access to skilled and experienced human resources. While firms' R&D frequently relies on experience (Cohen and Levinthal, 1989), learning-by-doing (Teece, 1986), and the tacit knowledge of employees, transferring this knowledge is difficult without involving the individuals holding it (Winter, 1987). Our findings suggest that the enactment of the UTSA indeed increases the likelihood of firms of being acquired.

But our research also uncovers important heterogeneity in the effects depending on the type of acquirer and the type of acquisition. Our results show that the strength of the effect of trade secret laws depends on the distance between acquirer and target, with stark differences in how they affect domestic and foreign acquirers. We find domestic acquirers to be much more motivated to engage on the market for corporate control than foreign acquirers, suggesting that foreign acquirers are disproportionately affected by increasing information asymmetries in their identification and assessment of potential target firms due to strengthened trade secret protection. These results build on and extend prior literature on the challenges that foreign firms face vis-à-vis domestic firms when they need to interpret information in the host countries they seek to

operate in (Anderson and Gatignon, 1986; Gehrig, 1993; Liesch et al., 2011). As a consequence, their limited ability to assess the implications of legal trade secret protection in a host country may lead foreign acquirers to overestimate the risks and to underestimate the benefits of an acquisition. Foreign acquirers are also subject to higher transaction costs, such as increased legal and advisory fees, because they need specialized expertise when dealing with legal provisions in the host country (Boeh, 2011). In turn, organizational costs are higher because foreign acquirers need to allocate scarce management attention to these tasks (Clougherty and Zhang, 2020). In this context, Liesch *et al.* (2011) highlight that foreign acquirer managers may perceive a lack of control which leads to higher perceived risk compared to domestic acquirers.

Moreover, we find that strengthened trade secret protection affects the ownership stake that domestic and foreign acquirers seek. Foreign acquirers prefer to make a minority rather than a majority stake acquisition of a target firm while domestic acquirers prefer majority over minority stakes. We attribute these differences to the informational challenges that domestic and foreign acquirers associate with a target firm. Domestic acquirers navigate the institutional framework more easily compared to foreign acquirers and can therefore better identify and assess the value of a potential target firm. With strengthened trade secret protection, majority stake acquisitions in which the acquirer takes full control and can fully exploit the target's trade secrets become much more attractive for domestic acquirers. Conversely, foreign acquirers have greater difficulties operating in a foreign institutional context which hinders their ability to identify and assess promising target firms ex-ante. Instead, foreign acquirers seek minority stakes to learn about a target's trade secrets ex-post. In that sense, our research extends literature on cross-border acquisitions (e.g., Clougherty and Zhang, 2020; Falaster *et al.*, 2021) by identifying trade secret protection as a new mechanism that explains how information asymmetries influence

foreign firms' acquisition strategies when entering foreign markets (e.g., Malhotra and Gaur, 2013; Lahiri *et al.*, 2014).

Our results also uncover that strengthened trade secret protection changes the acquisition strategy of firms more generally, even though to a different extent. We find that foreign acquirers more often than domestic acquirers follow a stepwise acquisition approach, repeatedly buying smaller stakes, but increased trade secret protection leads both, domestic and foreign acquirers, to follow a stepwise approach more often. Consistent with a real options strategy (Tong *et al.*, 2008), prior research has shown that firms acquire minority stakes to obtain growth options that allow the acquirer to expand ownership if uncertainty about the target's knowledge, technology, and assets resolves in a favorable way (Kogut, 1991). While such an approach turns out to be more common for foreign acquirers, which is consistent with the idea that these firms face greater information asymmetries, strengthened trade secret protection makes the pursuit of a real options strategy also more likely for domestic acquirers. This finding shows that strengthened trade secret protection also increases uncertainty for at least some domestic firms that respond by making stepwise investments.

The broader question that our study addresses concerns the institutional framework that governs strategic factor markets such as the market for corporate control, and, more specifically, how a legal change can impact the attractiveness of a particular strategic factor market (Besen and Raskind, 1991; Risch, 2007). A change in the institutional framework towards strengthened legal protection of trade secrets may, on the one hand, shift intellectual property protection from patents to trade secrets, while, on the other hand, restrict employees familiar with trade secrets in their mobility to other employers (Png and Samila, 2015; Contigiani *et al.*, 2018; Chen *et al.*, 2021). As a result, valuable knowledge and technology not only become less observable, but also

less accessible through labor markets, which changes firms' engagement on other strategic factor markets.

Implications

Institutional change can have consequences both intended and unintended by policymakers (e.g., Eberhart *et al.*, 2017; Castellaneta *et al.*, 2020). Strengthened trade secret protection intends to protect firms' competitive advantage by sanctioning the misappropriation of trade secrets that primarily occurs through employee mobility (Castellaneta *et al.*, 2017) and to provide incentives to invest in R&D (Png, 2017a). But a higher degree of protection also affects other firms' ability to access human capital on labor markets. In fact, our results are suggestive of a substitute relationship between different strategic factor markets because of institutional change. If increased trade secret protection not only makes firms more attractive acquisition targets but also limits other firms' ability to hire away skilled employees, firms revert to the market for corporate control to gain access to valuable knowledge and technology.

For the management of acquiring firms, our findings hold implications with respect to the degree of competition for potential acquisition targets. If trade secret protection leads foreign acquirers to prefer the acquisition of minority stakes, domestic acquirers face less competition when bidding for targets which may reduce acquisition prices. Conversely, foreign acquirers need to reconsider whether minority ownership allows for taking sufficient control over a target to benefit from its trade secrets.

Moreover, our results indicate that strengthened trade secret protection affects the level of FDI in a particular state. The interaction between trade secret protection and FDI policies highlights the need for policymakers to consider these dynamics when promoting FDI in their regions. If, in contrast, policymakers seek to prevent foreign acquirers from taking too much

control over domestic industry, trade secret law may be an instrument to achieve such a policy goal.

Limitations

While leveraging the UTSA provides us with an identification strategy for assessing the importance of trade secrets, our research is not without limitations, which in turn provide avenues for future research. First, our results suggest that the increased engagement of firms on the market for corporate control may substitute for hiring employees on labor markets. Since increased trade secret protection curtails employee mobility, firms may face constrains when using labor markets in order to hire scientists and engineers who possess valuable knowledge. Our research only focuses on the market for corporate control as one strategic factor market, assuming that knowledge and technology acquired here cannot be accessed through the labor market. Future research could thus seek to investigate the interplay of different strategic factor markets when the institutional framework changes.

Second, we share the limitation with other UTSA-based studies (e.g., Png, 2017a) that our analysis is limited to de jure law and does not capture actual financial consequences of misappropriation. We do not consider this a major drawback for our study though because our interest is on the strategic consequences of the UTSA. Lastly, our study is limited to publicly listed firms and hence cannot make claims for private U.S. firms and their likelihood to be acquired before and after the UTSA.

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TABLES

Table 1. Variable definitions

Variable label	Type	Description	Source
Any acquisition	B	Dummy equal to 1 if a firm is acquired in year *t*	Thomson One Banker
Domestic acquisition	B	Dummy equal to 1 if a firm is acquired by domestic firm in *t*	Thomson One Banker
Foreign acquisition	B	Dummy equal to 1 if a firm is acquired by foreign firm in *t*	Thomson One Banker
Domestic majority	B	Dummy equal to 1 if a firm is acquired in a majority acquisition by a domestic firm in year *t*	Thomson One Banker
Foreign majority	B	Dummy equal to 1 if a firm is acquired in a majority acquisition by a foreign firm in year *t*	Thomson One Banker
Domestic minority	B	Dummy equal to 1 if a firm is acquired in a minority acquisition by a domestic firm in year	Thomson One Banker
Foreign minority	B	Dummy equal to 1 if a firm is acquired in a minority acquisition by a foreign firm in year *t*	Thomson One Banker
Post-UTSA	B	Dummy equal to 1 for years after the enactment of the UTSA	Png (2017b)
Assets	C	Logarithm of book value of total assets (in millions of USD)	Compustat
Sales growth	C	Sale's growth rate (percent change from the preceding period)	Compustat
R&D	C	Ratio of R&D expenditures to assets (in millions of USD) (missing values are set to zero)	Compustat
R&D dummy	B	Dummy equal to 1 if R&D expenditures data is missing	-
Patents	C	Ratio of patent stock to R&D expenditures. The patent stock is constructed with the granted patents by year of application.	Kogan et al. (2017)
Citations	C	Ratio of citation stock to patent stock	Kogan et al. (2017)
Co-patents	C	Ratio of co-patent stock to patent stock	Kogan et al. (2017)
IDD	B	Dummy equal to 1 if the state courts recognize the Inevitable Disclosure Doctrine	Klasa et al. (2018)
CNC	C	A state-year level index of the degree of enforceability of non-compete agreements, ranging from 0 to 9, with higher scores indicating greater enforceability	Garmaise (2011) & Ertimur et al. (2018)
Bus. comb. laws	B	Dummy equal to 1 if the state has adopted business combination laws	Chen et al. (2021)
GDP growth	C	A state's GDP growth rate (percent change from preceding period)	Bureau of Economic Analysis

Note: B and C denote binary and continuous variables, respectively.

Table 2. Descriptive statistics

Variable	Mean	Std. Dev.	P25	P75	Obs.
Any acquisition	0.027	0.161	0.000	0.000	23391
Domestic acquisition	0.017	0.129	0.000	0.000	23160
Foreign acquisition	0.010	0.100	0.000	0.000	22996
Domestic majority	0.011	0.105	0.000	0.000	23020
Foreign majority	0.003	0.054	0.000	0.000	22831
Domestic minority	0.006	0.078	0.000	0.000	22905
Foreign minority	0.007	0.085	0.000	0.000	22930
Post-UTSA	0.244	0.430	0.000	0.000	23391
Assets	4.749	2.427	2.842	6.435	23391
Sales growth	0.657	35.991	-0.030	0.211	23391
R&D	0.033	0.696	0.000	0.012	23391
R&D dummy	0.567	0.496	0.000	1.000	23391
Patents	1.218	9.187	0.000	0.000	23391
Citations	7.757	23.869	0.000	7.373	23391
Co-patents	0.001	0.020	0.000	0.000	23391
IDD	0.393	0.488	0.000	1.000	23391
CNC	4.390	1.660	3.000	5.000	23391
Bus. comb. laws	0.414	0.492	0.000	1.000	23391
GDP growth	6.808	3.533	4.500	8.900	23391

Note: P25 and P75 stand for the 25% and 75% percentile, respectively.

Table 3. Comparison of means before and after the enactment of the UTSA

Variable	Mean bef.	Mean after	SD bef.	SD after	t-test	Sig. level	Obs. bef.	Obs. after
Any Acquisition	0.019	0.053	0.135	0.222	-13.652	0.000	17,658	5,710
Domestic Acquisition	0.012	0.034	0.107	0.181	-11.338	0.000	17,556	5,604
Foreign Acquisition	0.007	0.019	0.084	0.137	-7.839	0.000	17,477	5,519
Domestic Majority	0.007	0.023	0.085	0.171	-9.980	0.000	17,478	5,542
Foreign Majority	0.002	0.005	0.046	0.073	-3.840	0.000	17,389	5,442
Domestic Minority	0.005	0.011	0.067	0.106	-5.676	0.000	17,430	5,475
Foreign Minority	0.005	0.014	0.071	0.118	-6.871	0.000	17,440	5,490

Table 4. Fixed effects stacked regressions

	(1) Any Acquisition	(2) Domestic Acquisition	(3) Foreign Acquisition	(4) Domestic Majority	(5) Foreign Majority	(6) Domestic Minority	(7) Foreign Minority
Post-UTSA	0.058***	0.039***	0.021***	0.027***	0.006***	0.013***	0.015***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.001)	(0.002)	(0.003)
Observations	23391	23160	22996	23020	22831	22905	22930
Number of firms	2412	2412	2412	2412	2412	2412	2412
R-sq.	0.008	0.006	0.003	0.004	0.001	0.001	0.002

*Notes: Treatment effects on the treated. Firms observed at least once before and once after the UTSA. A 13 years window around the UTSA is used for the regressions. Std. errors are robust and clustered at state level. * p < 0.1, ** p < 0.05, *** p < 0.01.*

Table 5. Fixed effects stacked regressions, including covariates

	(1) Any Acquisition	(2) Domestic Acquisition	(3) Foreign Acquisition	(4) Domestic Majority	(5) Foreign Majority	(6) Domestic Minority	(7) Foreign Minority
Post-UTSA	0.049***	0.034***	0.017***	0.025***	0.005***	0.010***	0.012***
	(0.004)	(0.003)	(0.003)	(0.003)	(0.001)	(0.002)	(0.003)
Assets	0.017***	0.012***	0.006***	0.008***	0.002**	0.004***	0.004***
	(0.003)	(0.002)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)
Sales growth	0.000	0.000	0.000	-0.000	-0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
R&D	0.001	0.001	0.000	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
R&D dummy	-0.003	-0.002	-0.001	-0.000	-0.001	-0.002	-0.000
	(0.005)	(0.004)	(0.002)	(0.003)	(0.001)	(0.003)	(0.002)
Patents	-0.000*	-0.000	-0.000*	0.000	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Citations	0.000	0.000	0.000	0.000	-0.000	0.000	0.000**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Co-patents	0.032	0.052	-0.022***	-0.011	-0.002	0.063	-0.020***
	(0.077)	(0.079)	(0.006)	(0.015)	(0.002)	(0.074)	(0.006)
IDD	0.002	-0.000	0.003	0.004	-0.002	-0.005*	0.004
	(0.007)	(0.008)	(0.003)	(0.006)	(0.001)	(0.003)	(0.003)
CNC	-0.016**	-0.013**	-0.004	-0.010*	-0.003***	-0.004**	-0.001
	(0.006)	(0.006)	(0.003)	(0.005)	(0.001)	(0.001)	(0.003)
Bus. comb. laws	0.011*	0.004	0.007**	-0.002	0.003	0.005*	0.005**
	(0.006)	(0.005)	(0.003)	(0.003)	(0.002)	(0.003)	(0.002)
GDP growth	-0.001**	-0.000	-0.000**	0.000	-0.000	-0.000*	-0.000**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Constant	0.004	0.011	-0.002	0.007	0.009	0.004	-0.011
	(0.039)	(0.034)	(0.016)	(0.028)	(0.006)	(0.010)	(0.013)
Observations	23391	23160	22996	23020	22831	22905	22930
Number of firms	2412	2412	2412	2412	2412	2412	2412
R-sq.	0.004	0.003	0.001	0.001	0.000	0.002	0.001

*Notes: Treatment effects on the treated. Firms observed at least once before and once after the UTSA. A 13 years window around the UTSA is used for the regressions. Std. errors are robust and clustered at the state level. * p < 0.1, ** p < 0.05, *** p < 0.01.*

Table 6. Fixed effects stacked regressions: domestic acquisitions sample split I

	Target and acquirer are in different states			Target and acquirer are in the same state		
	(1) Domestic Acquisition	(2) Domestic Majority	(3) Domestic Minority	(4) Domestic Acquisition	(5) Domestic Majority	(6) Domestic Minority
Post-UTSA	0.212***	0.155***	0.078***	0.219***	0.222***	0.006
	(0.017)	(0.019)	(0.014)	(0.038)	(0.037)	(0.021)
Observations	2147	2054	1980	675	657	604
Number of firms	260	260	260	89	89	89
R-sq.	0.016	0.005	0.018	0.026	0.027	0.002

*Notes: Treatment effects on the treated. Firms need to be observed at least once before and once after the UTSA. A 13 years window around the UTSA is used for the regressions. The regressions include firm and state level controls. For the firm level controls: the log of total assets, sales growth. R&D/assets, a binary variable indicating whether the firm had positive R&D investment, patent stock over R&D expenditures, citation stock over patent stock, and co-patent stock over patent stock. For the state level controls: IDD, CNC, business combination laws and the states' GDP growth. Standard errors are robust and clustered at the state level. * p < 0.1, ** p < 0.05, *** p < 0.01.*

Table 7. Fixed effects stacked regressions: foreign acquisitions sample split I

	Institutional distance between target and acquirer is less than the median			Institutional distance between target and acquirer is more than the median		
	(1) Foreign Acquisition	(2) Foreign Majority	(3) Foreign Minority	(4) Foreign Acquisition	(5) Foreign Majority	(6) Foreign Minority
Post-UTSA	0.033	0.034	0.001	0.139***	0.042	0.100***
	(0.023)	(0.026)	(0.018)	(0.042)	(0.041)	(0.033)
Observations	465	456	448	351	325	336
Number of firms	66	66	66	41	41	41
R-sq.	0.001	0.001	0.003	0.010	0.003	0.002

*Notes: Treatment effects on the treated. Firms need to be observed at least once before and once after the UTSA. A 13 years window around the UTSA is used for the regressions. The regressions include firm and state level controls. For the firm level controls: the log of total assets, sales growth. R&D/assets, a binary variable indicating whether the firm had positive R&D investment, patent stock over R&D expenditures, citation stock over patent stock, and co-patent stock over patent stock. For the state level controls: IDD, CNC, business combination laws and the states' GDP growth. Standard errors are robust and clustered at the state level. * p < 0.1, ** p < 0.05, *** p < 0.01.*

Table 8. Percentage of stepwise acquisitions with an initial minority stake

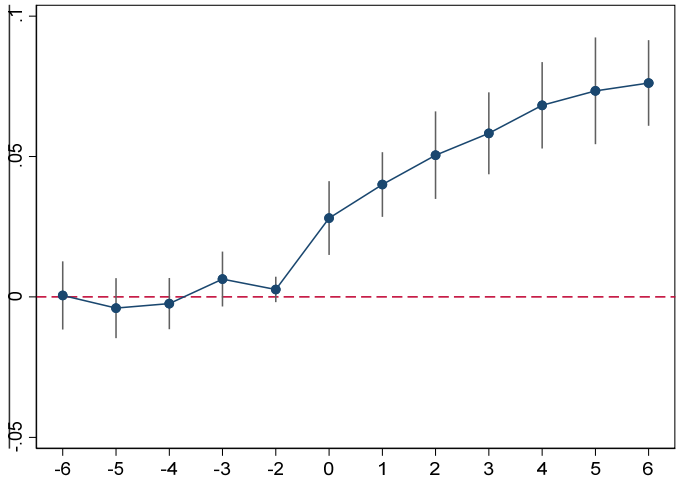
	Pre-UTSA	Post-UTSA	Total
	as a percentage of all pre-UTSA domestic/foreign acquisitions	as a percentage of all post-UTSA domestic/foreign acquisitions	as a percentage of all acquisitions
			8.48%
Domestic acquisitions	6.36%	8.59%	6.80%
Foreign acquisitions	9.57%	10.05%	1.68%

Notes: The figures are based on the unmatched sample which uses a 13-years time window. Firms do not need to be observed before and after the UTSA.

APPENDIX

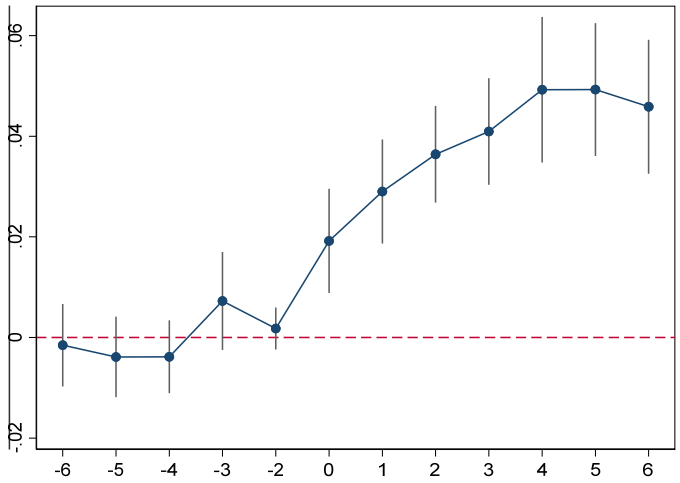
FIGURES

Figure A1. All acquisitions



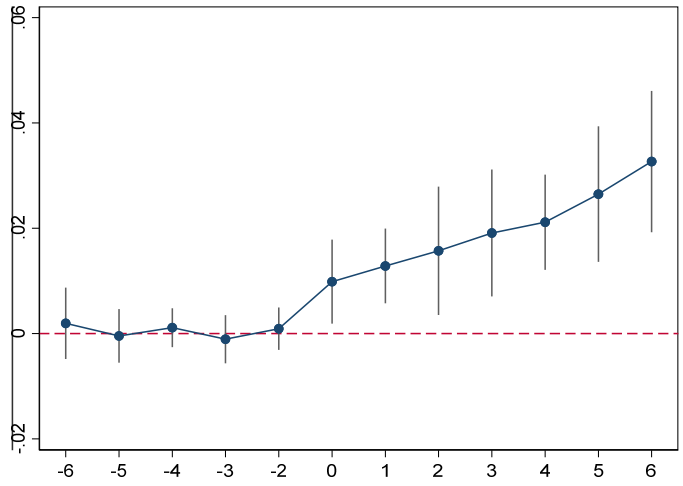
Notes: Yearly treatment effects on the treated based on fixed effects regressions for the full matched sample. The control variables include firm and state level controls. Firm level controls: the log of total assets, sales growth. R&D/assets, a binary variable indicating whether the firm had positive R&D investment, patent stock over R&D expenditures, citation stock over patent stock and co-patent stock over patent stock. For state level controls: IDD, CNC, business combination laws and GDP growth. Standard errors are robust and clustered at the state level.

Figure A2. Domestic acquisitions



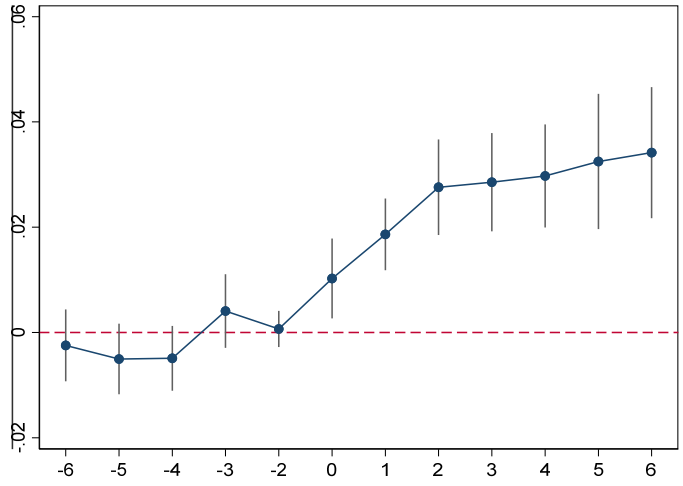
Notes: Yearly treatment effects on the treated based on fixed effects regressions for the full matched sample. The control variables include firm and state level controls. Firm level controls: the log of total assets, sales growth. R&D/assets, a binary variable indicating whether the firm had positive R&D investment, patent stock over R&D expenditures, citation stock over patent stock and co-patent stock over patent stock. For state level controls: IDD, CNC, business combination laws and GDP growth. Standard errors are robust and clustered at the state level.

Figure A3. Foreign acquisitions



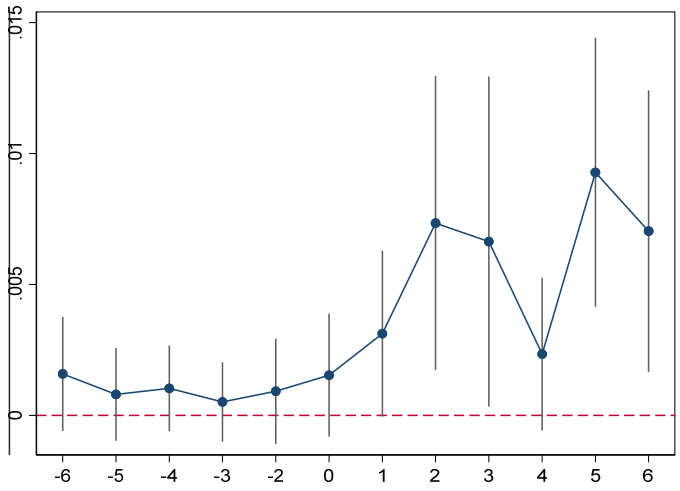
Notes: Yearly treatment effects on the treated based on fixed effects regressions for the full matched sample. The control variables include firm and state level controls. Firm level controls: the log of total assets, sales growth. R&D/assets, a binary variable indicating whether the firm had positive R&D investment, patent stock over R&D expenditures, citation stock over patent stock and co-patent stock over patent stock. For state level controls: IDD, CNC, business combination laws and GDP growth. Standard errors are robust and clustered at the state level.

Figure A4. Domestic majority acquisitions



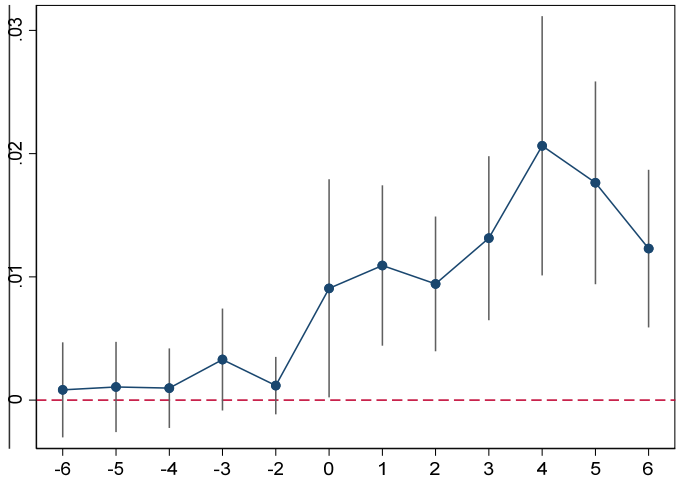
Notes: Yearly treatment effects on the treated based on fixed effects regressions for the full matched sample. The control variables include firm and state level controls. Firm level controls: the log of total assets, sales growth. R&D/assets, a binary variable indicating whether the firm had positive R&D investment, patent stock over R&D expenditures, citation stock over patent stock and co-patent stock over patent stock. For state level controls: IDD, CNC, business combination laws and GDP growth. Standard errors are robust and clustered at the state level.

Figure A5. Foreign majority acquisitions



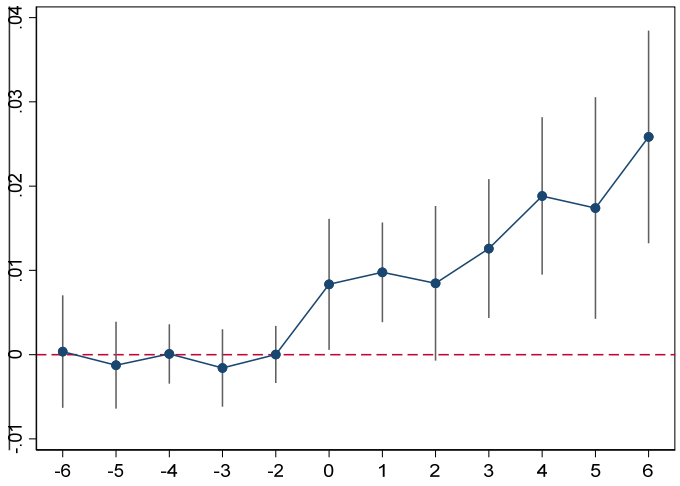
Notes: Yearly treatment effects on the treated based on fixed effects regressions for the full matched sample. The control variables include firm and state level controls. Firm level controls: the log of total assets, sales growth. R&D/assets, a binary variable indicating whether the firm had positive R&D investment, patent stock over R&D expenditures, citation stock over patent stock and co-patent stock over patent stock. For state level controls: IDD, CNC, business combination laws and GDP growth. Standard errors are robust and clustered at the state level.

Figure A6. Domestic minority acquisitions



Notes: Yearly treatment effects on the treated based on fixed effects regressions for the full matched sample. The control variables include firm and state level controls. Firm level controls: the log of total assets, sales growth. R&D/assets, a binary variable indicating whether the firm had positive R&D investment, patent stock over R&D expenditures, citation stock over patent stock and co-patent stock over patent stock. For state level controls: IDD, CNC, business combination laws and GDP growth. Standard errors are robust and clustered at the state level.

Figure A7. Foreign minority acquisitions



Notes: Yearly treatment effects on the treated based on fixed effects regressions for the full matched sample. The control variables include firm and state level controls. Firm level controls: the log of total assets, sales growth. R&D/assets, a binary variable indicating whether the firm had positive R&D investment, patent stock over R&D expenditures, citation stock over patent stock and co-patent stock over patent stock. For state level controls: IDD, CNC, business combination laws and GDP growth. Standard errors are robust and clustered at the state level.

TABLES

Table A1. Distribution of observations across 2-digit Standard Industrial Classification (SIC) industries.

Industry 2-digit SIC	Freq.	Percent
Agriculture, Forestry, & Fishing		
1	8	0.03
8	10	0.04
9	13	0.06
Mining		
10	178	0.76
12	31	0.13
13	970	4.15
14	19	0.08
Construction		
15	235	1
16	69	0.29
17	53	0.23
Manufacturing		
20	366	1.56
21	11	0.05
22	196	0.84
23	202	0.86
24	181	0.77
25	245	1.05
26	230	0.98
27	357	1.53
28	1,303	5.57
29	157	0.67
30	406	1.74
31	55	0.24
32	175	0.75
33	345	1.47
34	470	2.01
35	1,274	5.45
36	1,272	5.44
37	379	1.62
38	1,134	4.85
39	285	1.22
Transportation & Public Utilities		
40	39	0.17
41	9	0.04
42	240	1.03
44	68	0.29
45	186	0.8
46	16	0.07
47	69	0.29
48	699	2.99
49	2,050	8.76
Wholesale Trade		
50	679	2.9
51	417	1.78
Retail Trade		
52	120	0.51
53	194	0.83
54	223	0.95
55	93	0.4
56	193	0.83
57	56	0.24
58	400	1.71
59	366	1.56
Finance, Insurance, & Real Estate		
60	1,279	5.47
61	467	2
62	261	1.12
63	387	1.65
64	98	0.42
65	451	1.93
67	888	3.8
Services		
70	115	0.49
72	82	0.35
73	1,492	6.38
75	58	0.25
76	26	0.11
78	104	0.44
79	175	0.75
80	188	0.8
82	48	0.21
83	36	0.15
87	288	1.23
89	3	0.01
Nonclassifiable Establishments		
99	199	0.85
Total	**23,391**	**100**

Table A2. UTSA year of enactment by state (years 1980-2010)

State	Year
Alaska	1988
Arizona	1990
Arkansas	1981
California	1985
Colorado	1986
Connecticut	1983
Delaware	1982
District. of Columbia	1989
Florida	1988
Georgia	1990
Hawaii	1989
Idaho	1981
Illinois	1988
Indiana	1982
Iowa	1990
Kansas	1981
Kentucky	1990
Louisiana	1981
Maine	1987
Maryland	1989
Michigan	1998
Minnesota	1980
Mississippi	1990
Missouri	1995
Montana	1985
Nebraska	1988
Nevada	1987
New Hampshire	1990
New Mexico	1989
North Dakota	1983
Ohio	1994
Oklahoma	1986
Oregon	1988
Pennsylvania	2004
Rhode Island	1986
South Carolina	1992
South Dakota	1988
Tennessee	2000
Utah	1989
Vermont	1996
Virginia	1986
Washington	1982
West Virginia	1986
Wyoming	2006

Source: Png (2017b)

Table A3. Fixed effects stacked regressions: no time window

	(1) Any Acquisition	(2) Domestic Majority	(3) Foreign Majority	(4) Domestic Minority	(5) Foreign Minority
Post-UTSA	0.041***	0.023***	0.005***	0.007***	0.008***
	(0.005)	(0.003)	(0.001)	(0.002)	(0.003)
Assets	0.012***	0.007***	0.002***	0.003***	0.001*
	(0.002)	(0.001)	(0.000)	(0.000)	(0.001)
Sales growth	0.000	0.000**	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
R&D	0.004	0.002	0.000	0.001	0.000
	(0.002)	(0.001)	(0.000)	(0.001)	(0.001)
R&D dummy	0.001	0.002	0.001	0.001	-0.003
	(0.004)	(0.002)	(0.001)	(0.002)	(0.003)
Patents	0.000***	0.000**	-0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Citations	0.000	0.000	-0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Co-patents	-0.001***	-0.001***	-0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
IDD	0.002	0.002	0.002*	-0.001	-0.001
	(0.005)	(0.003)	(0.001)	(0.001)	(0.002)
CNC	-0.010**	-0.005	-0.002**	-0.003**	-0.001
	(0.005)	(0.003)	(0.001)	(0.001)	(0.001)
Bus. comb. laws	0.016***	0.005**	0.002*	0.002	0.008***
	(0.005)	(0.002)	(0.001)	(0.001)	(0.002)
GDP growth	-0.000*	0.000	0.000	-0.000**	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Constant	-0.012	-0.015	-0.002	0.004	0.001
	(0.023)	(0.016)	(0.005)	(0.005)	(0.006)
Observations	38237	37695	37375	37446	37483
Number of firms	2406	2406	2406	2406	2406
R-sq.	0.003	0.003	0.000	0.001	0.000

*Notes: Treatment effects on the treated. Firms need to be observed at least once before and once after the UTSA. The regressions include firm and state level controls. For the firm level controls: the log of total assets, sales growth. R&D/assets, a binary variable indicating whether the firm had positive R&D investment, patent stock over R&D expenditures, citation stock over patent stock, and co-patent stock over patent stock. For the state level controls: IDD, CNC, business combination laws and the states' GDP growth. Standard errors are robust and clustered at the state level. * p < 0.1, ** p < 0.05, *** p < 0.01.*

Table A4. Fixed effects stacked regressions: Different time windows

	(1) Any Acquisition	(2) Domestic Majority	(3) Foreign Majority	(4) Domestic Minority	(5) Foreign Minority
Post-UTSA (+/-4 years)	0.046***	0.024***	0.004***	0.010***	0.010***
	(0.005)	(0.003)	(0.001)	(0.002)	(0.003)
Observations	20919	20583	20416	20489	20499
Number of firms	2412	2412	2412	2412	2412
	(1) Any Acquisition	(2) Domestic Majority	(3) Foreign Majority	(4) Domestic Minority	(5) Foreign Minority
Post-UTSA (+/-5 years)	0.048***	0.024***	0.005***	0.010***	0.011***
	(0.005)	(0.003)	(0.001)	(0.002)	(0.003)
Observations	20919	20583	20416	20489	20499
Number of firms	2412	2412	2412	2412	2412
	(1) Any Acquisition	(2) Domestic Majority	(3) Foreign Majority	(4) Domestic Minority	(5) Foreign Minority
Post-UTSA (+/-7 years)	0.043***	0.023***	0.005***	0.010***	0.007**
	(0.006)	(0.003)	(0.001)	(0.002)	(0.003)
Observations	25190	24784	24590	24656	24687
Number of firms	2406	2406	2406	2406	2406
	(1) Any Acquisition	(2) Domestic Majority	(3) Foreign Majority	(4) Domestic Minority	(5) Foreign Minority
Post-UTSA (+/-8 years)	0.044***	0.023***	0.005***	0.010***	0.008***
	(0.005)	(0.003)	(0.001)	(0.002)	(0.003)
Observations	26996	26561	26358	26427	26457
Number of firms	2406	2406	2406	2406	2406
	(1) Any Acquisition	(2) Domestic Majority	(3) Foreign Majority	(4) Domestic Minority	(5) Foreign Minority
Post-UTSA (+/-9 years)	0.043***	0.023***	0.005***	0.009***	0.008***
	(0.005)	(0.003)	(0.001)	(0.002)	(0.003)
Observations	28515	28067	27847	27915	27951
Number of firms	2406	2406	2406	2406	2406

*Notes: Treatment effects on the treated. Firms need to be observed at least once before and once after the UTSA. The regressions include firm and state level controls. For the firm level controls: the log of total assets, sales growth. R&D/assets, a binary variable indicating whether the firm had positive R&D investment, patent stock over R&D expenditures, citation stock over patent stock, and co-patent stock over patent stock. For the state level controls: IDD, CNC, business combination laws and the states' GDP growth. Standard errors are robust and clustered at the state level. * p < 0.1, ** p < 0.05, *** p < 0.01.*

Table A5. Parallel trends coefficients, including covariates

	(1) Any Acquisition	(2) Domestic Acquisition	(3) Foreign Acquisition	(4) Domestic Majority	(5) Foreign Majority	(6) Domestic Minority	(7) Foreign Minority
-6	0.001	-0.002	0.002	-0.002	0.002	0.001	0.000
	(0.006)	(0.004)	(0.003)	(0.003)	(0.001)	(0.002)	(0.003)
-5	-0.004	-0.004	-0.000	-0.005	0.001	0.001	-0.001
	(0.005)	(0.004)	(0.003)	(0.003)	(0.001)	(0.002)	(0.003)
-4	-0.002	-0.004	0.001	-0.005	0.001	0.001	0.000
	(0.005)	(0.004)	(0.002)	(0.003)	(0.001)	(0.002)	(0.002)
-3	0.006	0.007	-0.001	0.004	0.001	0.003	-0.002
	(0.005)	(0.005)	(0.002)	(0.003)	(0.001)	(0.002)	(0.002)
-2	0.003	0.002	0.001	0.001	0.001	0.001	0.000
	(0.002)	(0.002)	(0.002)	(0.002)	(0.001)	(0.001)	(0.002)
0	0.028***	0.019***	0.010**	0.010***	0.002	0.009**	0.008**
	(0.007)	(0.005)	(0.004)	(0.004)	(0.001)	(0.004)	(0.004)
1	0.040***	0.029***	0.013***	0.019***	0.003*	0.011***	0.010***
	(0.006)	(0.005)	(0.004)	(0.003)	(0.002)	(0.003)	(0.003)
2	0.050***	0.036***	0.016**	0.028***	0.007**	0.009***	0.008*
	(0.008)	(0.005)	(0.006)	(0.005)	(0.003)	(0.003)	(0.005)
3	0.058***	0.041***	0.019***	0.029***	0.007**	0.013***	0.013***
	(0.007)	(0.005)	(0.006)	(0.005)	(0.003)	(0.003)	(0.004)
4	0.068***	0.049***	0.021***	0.030***	0.002	0.021***	0.019***
	(0.008)	(0.007)	(0.004)	(0.005)	(0.001)	(0.005)	(0.005)
5	0.073***	0.049***	0.026***	0.032***	0.009***	0.018***	0.017**
	(0.009)	(0.007)	(0.006)	(0.006)	(0.003)	(0.004)	(0.007)
6	0.076***	0.046***	0.033***	0.034***	0.007**	0.012***	0.026***
	(0.008)	(0.007)	(0.007)	(0.006)	(0.003)	(0.003)	(0.006)
Observations	23391	23160	22996	23020	22831	22905	22930
Number of firms	2412	2412	2412	2412	2412	2412	2412
R-sq.	0.004	0.003	0.002	0.001	0.000	0.002	0.002

*Notes: Yearly treatment effects on the treated based on fixed effects regressions for the full sample. The control variables include firm and state level controls. For the firm level: the log of total assets, sales growth. R&D/assets, a binary variable indicating whether the firm had positive R&D investment, patent stock over R&D expenditures, citation stock over patent stock and co-patent stock over patent stock. For the state level controls: IDD, CNC, business combination laws and the states' GDP growth. Standard errors are robust and clustered at the state level. * p < 0.1, ** p < 0.05, *** p < 0.01.*

Table A6. Bivariate correlations

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
(1) Any Acquisition	1.000																		
(2) Domestic acq.		1.000																	
(3) Foreign acq.			1.000																
(4) Domestic maj.				1.000															
(5) Foreign maj.					1.000														
(6) Domestic min.						1.000													
(7) Foreign min.							1.000												
(8) Post-UTSA	0.089	0.074	0.052	0.066	0.025	0.038	0.045	1.000											
(9) Assets	0.036	0.036	0.011	0.027	0.008	0.025	0.009	0.055	1.000										
(10) Sales growth	-0.002	-0.002	-0.001	-0.001	-0.001	-0.001	-0.001	-0.005	-0.013	1.000									
(11) R&D	-0.001	0.000	-0.001	-0.001	-0.001	0.001	-0.001	-0.001	-0.047	0.002	1.000								
(12) R&D dummy	-0.013	-0.004	-0.017	0.002	-0.009	-0.008	-0.014	-0.012	0.181	-0.004	-0.054	1.000							
(13) Patents	-0.002	-0.003	0.001	-0.005	0.000	0.001	0.002	0.017	-0.051	-0.002	0.001	-0.152	1.000						
(14) Citations	0.013	0.009	0.010	0.000	0.000	0.016	0.011	0.014	0.047	-0.004	0.014	-0.196	0.110	1.000					
(15) Co-patents	0.002	0.005	-0.004	-0.002	-0.002	0.011	-0.003	0.029	0.020	-0.001	0.002	-0.041	0.007	0.030	1.000				
(16) IDD	0.003	0.003	0.002	0.008	0.004	-0.007	0.000	-0.143	0.026	0.005	0.015	-0.012	-0.022	0.027	0.030	1.000			
(17) CNC	0.003	0.011	-0.009	0.020	0.001	-0.010	-0.012	0.080	0.082	-0.005	-0.005	-0.017	0.005	0.002	0.022	-0.022	1.000		
(18) Bus. comb. laws	0.007	0.009	0.001	0.016	0.006	-0.007	-0.003	0.100	0.130	-0.008	0.008	-0.051	-0.024	0.029	-0.006	0.359	0.163	1.000	
(19) GDP growth	-0.009	-0.007	-0.006	-0.006	-0.004	-0.003	-0.005	-0.087	-0.091	0.002	-0.010	-0.013	0.036	-0.014	0.009	-0.142	-0.092	-0.358	1.000

Table A7. Fixed effects stacked regressions: domestic acquisitions sample split II

	Target and acquirer are located in states that are not neighbouring			Target and acquirer are located in states that are neighbouring		
	(1) Domestic Acquisition	(2) Domestic Majority	(3) Domestic Minority	(4) Domestic Acquisition	(5) Domestic Majority	(6) Domestic Minority
Post-UTSA	0.210***	0.157***	0.074***	0.222***	0.231***	-0.008
	(0.017)	(0.019)	(0.013)	(0.045)	(0.044)	(0.027)
Observations	2441	2339	2241	381	372	343
Number of firms	302	302	302	47	47	47
R-sq.	0.017	0.007	0.015	0.006	0.013	0.001

*Notes: Treatment effects on the treated. Firms need to be observed at least once before and once after the UTSA. A 13 years window around the UTSA is used for the regressions. The regressions include firm and state level controls. For the firm level controls: the log of total assets, sales growth. R&D/assets, a binary variable indicating whether the firm had positive R&D investment, patent stock over R&D expenditures, citation stock over patent stock, and co-patent stock over patent stock. For the state level controls: IDD, CNC, business combination laws and the states' GDP growth. Standard errors are robust and clustered at the state level. * p < 0.1, ** p < 0.05, *** p < 0.01.*

Table A8. Fixed effects stacked regressions: foreign acquisitions sample split II

	Institutional distance between target and acquirer is less than the 33rd percentile			Institutional distance between target and acquirer is more than the 66th percentile		
	(1) Foreign Acquisition	(2) Foreign Majority	(3) Foreign Minority	(4) Foreign Acquisition	(5) Foreign Majority	(6) Foreign Minority
Post-UTSA	-0.051	-0.018	-0.034	0.119**	0.047	0.079**
	(0.083)	(0.104)	(0.044)	(0.046)	(0.049)	(0.032)
Observations	165	157	152	153	141	147
Number of firms	21	21	21	18	18	18
R-sq.	0.006	0.009	0.001	0.028	0.001	0.070

*Notes: Treatment effects on the treated. Firms need to be observed at least once before and once after the UTSA. A 13 years window around the UTSA is used for the regressions. The regressions include firm and state level controls. For the firm level controls: the log of total assets, sales growth. R&D/assets, a binary variable indicating whether the firm had positive R&D investment, patent stock over R&D expenditures, citation stock over patent stock, and co-patent stock over patent stock. For the state level controls: IDD, CNC, business combination laws and the states' GDP growth. Standard errors are robust and clustered at the state level. * p < 0.1, ** p < 0.05, *** p < 0.01.*

Table A9. Average number of steps for acquisitions with an initial minority stake

	Average number of steps	Std. dev.	Obs.	t-stat
Domestic acquisitions				
Pre-UTSA	1.24	0.05	188	0.42
Post-UTSA	1.29	0.02	953	
Foreign acquisitions				
Pre-UTSA	1.15	0.05	62	0.48
Post-UTSA	1.19	0.03	177	

Notes: The figures are based on the unmatched sample which uses a 13-years time window. Firms do not need to be observed before and after the UTSA.

Table A10. Average stake acquired by step for acquisitions with an initial minority stake

	Domestic acquisitions		Foreign acquisitions		Total	
Step 1	12.27%		11.65%		12.15%	
Step >1	14.40%		11.44%		13.92%	
	Pre-UTSA	Post-UTSA	Pre-UTSA	Post-UTSA	Pre-UTSA	Post-UTSA
Step 1	22.88%	10.54%	11.68%	11.65%	20.30%	10.75%
Step >1	14.70%	14.36%	15.30%	10.80%	14.80%	13.77%

Notes: The figures are based on the unmatched sample which uses a 13-years time window. Firms do not need to be observed before and after the UTSA.

Table A11. Percentage of stepwise acquisitions with an initial minority stake – same, different, or neighbouring states

	Pre-UTSA	Post-UTSA	Total
	as a percentage of all pre-UTSA domestic/foreign acquisitions	as a percentage of all post-UTSA domestic/foreign acquisitions	as a percentage of all acquisitions
Domestic acquisitions			6.80%
Same state acquisitions	0.64%	0.61%	0.51%
Different state acquisitions	5.72%	7.98%	6.29%
Neighboring state acquisitions	0.21%	0.37%	0.28%
Non-neighboring state acquisitions	5.51%	7.61%	6.01%

Notes: The figures are based on the unmatched sample which uses a 13-years time window. Firms do not need to be observed before and after the UTSA.

Table A12. Average number of steps for acquisitions with an initial minority stake – same, different, or neighbouring states

	Average number of steps	Std. dev.	Obs.	t-stat
Same domestic state				
Pre-UTSA	1.14	0.08	29	0.99
Post-UTSA	1.14	0.04	123	
Different domestic states				
Pre-UTSA	1.26	0.06	159	0.46
Post-UTSA	1.31	0.03	839	
Neighboring domestic states				
Pre-UTSA	1.07	0.07	14	0.50
Post-UTSA	1.16	0.06	69	
Non-neighboring domestic states				
Pre-UTSA	1.28	0.06	145	0.53
Post-UTSA	1.32	0.03	761	

Notes: The figures are based on the unmatched sample which uses a 13-years time window. Firms do not need to be observed before and after the UTSA.

Table A13. Fixed effects stacked regressions for the state of California

			No covariates		
	(1) Any Acquisition	(2) Domestic Majority	(3) Foreign Majority	(4) Domestic Minority	(5) Foreign Minority
Post-UTSA	0.079***	0.025***	0.012**	0.014**	0.032***
	(0.014)	(0.008)	(0.005)	(0.006)	(0.010)
Observations	5206	5179	5174	5177	5183
Number of firms	1032	1032	1032	1032	1032
R-sq.	0.057	0.015	0.010	0.012	0.023
			Covariates		
	(1) Any Acquisition	(2) Domestic Majority	(3) Foreign Majority	(4) Domestic Minority	(5) Foreign Minority
Post-UTSA	0.078***	0.024***	0.012**	0.014**	0.032***
	(0.015)	(0.008)	(0.005)	(0.006)	(0.010)
Observations	5206	5179	5174	5177	5183
Number of firms	1032	1032	1032	1032	1032
R-sq.	0.040	0.008	0.002	0.003	0.020

*Notes: Treatment effects on the treated. The not yet treated states used as controls. Firms need to be observed at least once before and once after the UTSA. A 13 years window around the UTSA is used for the regressions. The control variables in the lower panel include firm and state level controls. For the firm level controls: the log of total assets, sales growth. R&D/assets, a binary variable indicating whether the firm had positive R&D investment, patent stock over R&D expenditures, citation stock over patent stock, and co-patent stock over patent stock. For the state level controls: IDD, CNC, business combination laws and the states' GDP growth. Standard errors are robust. * p < 0.1, ** p < 0.05, *** p < 0.01.*

Table A14. Fixed effects stacked regressions: placebo (non-treated firms and not yet treated firms)

	(1) Any Acquisition	(2) Domestic Majority	(3) Foreign Majority	(4) Domestic Minority	(5) Foreign Minority
Placebo Post-UTSA	0.004	0.004	-0.001	0.001	0.000
	(0.004)	(0.003)	(0.003)	(0.001)	(0.002)
Observations	11058	10877	10784	10811	10833
Number of firms	1308.000	1308.000	1308.000	1308.000	1308.000
R-sq.					

*Notes: Treatment effects on the treated. Only non-treated firms and not yet treated firms are included in the sample. 65% of the observations are randomly assigned the placebo treatment, which like the original UTSA is spread over 17 different years (as shown in Table A2). Firms are matched according to the same criteria as the original matched sample (used in Table 5) and need to be observed at least once before and once after the UTSA. A 13 years window around the UTSA is used for the regressions. The regressions include firm and state level controls. Firm level controls: the log of total assets, sales growth. R&D/assets, a binary variable indicating whether the firm had positive R&D investment, patent stock over R&D expenditures, citation stock over patent stock and co-patent stock over patent stock. State level controls: IDD, CNC, business combination laws and GDP growth. Standard errors are robust and clustered at the state level. * p < 0.1, ** p < 0.05, *** p < 0.01.*

Table A15. Fixed effects stacked regressions: size sample split I (small firms)

	(1) Any Acquisition	(2) Domestic Majority	(3) Foreign Majority	(4) Domestic Minority	(5) Foreign Minority
Post-UTSA	0.023***	0.011***	0.002	0.007**	0.004*
	(0.005)	(0.003)	(0.001)	(0.003)	(0.002)
Observations	5849	5802	5787	5799	5801
Number of firms	875	875	875	875	875
R-sq.	0.004	0.003	0.001	0.001	0.001

*Notes: Treatment effects on the treated. Only firms in the 25th percentile or lower in the size (measured with assets) distribution are included. Firms need to be observed at least once before and once after the UTSA. A 13 years window around the UTSA is used for the regressions. The regressions include firm and state level controls. For the firm level controls: the log of total assets, sales growth. R&D/assets, a binary variable indicating whether the firm had positive R&D investment, patent stock over R&D expenditures, citation stock over patent stock and co-patent stock over patent stock. For the state level controls: IDD, CNC, business combination laws and the states' GDP growth. Standard errors are robust and clustered at the state level. * p < 0.1, ** p < 0.05, *** p < 0.01.*

Table A16. Fixed effects stacked regressions: size sample split II (medium firms)

	(1) Any Acquisition	(2) Domestic Majority	(3) Foreign Majority	(4) Domestic Minority	(5) Foreign Minority
Post-UTSA	0.049***	0.025***	0.005***	0.010***	0.012***
	(0.004)	(0.003)	(0.001)	(0.002)	(0.003)
Observations	23391	23020	22831	22905	22930
Number of firms	2412	2412	2412	2412	2412
R-sq.	0.004	0.001	0.000	0.002	0.001

*Notes: Treatment effects on the treated. Only firms in the 26th percentile to 74th percentile in the size (measured with assets) distribution are included. Firms need to be observed at least once before and once after the UTSA. A 13 years window around the UTSA is used for the regressions. The regressions include firm and state level controls. For the firm level controls: the log of total assets, sales growth. R&D/assets, a binary variable indicating whether the firm had positive R&D investment, patent stock over R&D expenditures, citation stock over patent stock and co-patent stock over patent stock. For the state level controls: IDD, CNC, business combination laws and the states' GDP growth. Standard errors are robust and clustered at the state level. * p < 0.1, ** p < 0.05, *** p < 0.01.*

Table A17. Fixed effects stacked regressions: size sample split III (large firms)

	(1) Any Acquisition	(2) Domestic Majority	(3) Foreign Majority	(4) Domestic Minority	(5) Foreign Minority
Post-UTSA	0.039***	0.018***	0.003	0.015***	0.004
	(0.009)	(0.004)	(0.003)	(0.004)	(0.003)
Observations	5848	5749	5693	5728	5712
Number of firms	712	710	706	706	708
R-sq.	0.000	0.000	0.000	0.001	0.001

*Notes: Treatment effects on the treated. Only firms in the 75th percentile or higher in the size (measured with assets) distribution are included. Firms need to be observed at least once before and once after the UTSA. A 13 years window around the UTSA is used for the regressions. The regressions include firm and state level controls. For the firm level controls: the log of total assets, sales growth. R&D/assets, a binary variable indicating whether the firm had positive R&D investment, patent stock over R&D expenditures, citation stock over patent stock and co-patent stock over patent stock. For the state level controls: IDD, CNC, business combination laws and the states' GDP growth. Standard errors are robust and clustered at the state level. * p < 0.1, ** p < 0.05, *** p < 0.01.*

Table A18. Fixed effects stacked regressions: industry and state clustered standard errors

	(1) Any Acquisition	(2) Domestic Majority	(3) Foreign Majority	(4) Domestic Minority	(5) Foreign Minority
Post-UTSA	0.049***	0.025***	0.005***	0.010***	0.012***
	(0.005)	(0.004)	(0.001)	(0.001)	(0.003)
Observations	23391	23020	22831	22905	22930
Number of firms	2412	2412	2412	2412	2412
R-sq.	0.004	0.001	0.000	0.002	0.001

*Notes: Treatment effects on the treated. Firms need to be observed at least once before and once after the UTSA. A 13 years window around the UTSA is used for the regressions. The regressions include firm and state level controls. For the firm level controls: the log of total assets, sales growth. R&D/assets, a binary variable indicating whether the firm had positive R&D investment, patent stock over R&D expenditures, citation stock over patent stock, and co-patent stock over patent stock. For the state level controls: IDD, CNC, business combination laws and the states' GDP growth. Standard errors are robust and clustered at the industry and state level. * p < 0.1, ** p < 0.05, *** p < 0.01.*

Table A19. Fixed effects stacked regressions: industry clustered standard errors

	(1) Any Acquisition	(2) Domestic Majority	(3) Foreign Majority	(4) Domestic Minority	(5) Foreign Minority
Post-UTSA	0.049***	0.025***	0.005***	0.010***	0.012***
	(0.005)	(0.004)	(0.001)	(0.001)	(0.002)
Observations	23391	23020	22831	22905	22930
Number of firms	2412	2412	2412	2412	2412
R-sq.	0.004	0.001	0.000	0.002	0.001

*Notes: Treatment effects on the treated. Firms need to be observed at least once before and once after the UTSA. A 13 years window around the UTSA is used for the regressions. The regressions include firm and state level controls. For the firm level controls: the log of total assets, sales growth. R&D/assets, a binary variable indicating whether the firm had positive R&D investment, patent stock over R&D expenditures, citation stock over patent stock, and co-patent stock over patent stock. For the state level controls: IDD, CNC, business combination laws and the states' GDP growth. Standard errors are robust and clustered at the industry level. * p < 0.1, ** p < 0.05, *** p < 0.01.*

Table A20. Fixed effects stacked regressions: strength of UTSA as main independent variable (no covariates)

	(1) Any Acquisition	(2) Domestic Majority	(3) Foreign Majority	(4) Domestic Minority	(5) Foreign Minority
UTSA Strength	0.108***	0.049***	0.007***	0.024***	0.034***
	(0.011)	(0.006)	(0.002)	(0.005)	(0.005)
Observations	23391	23020	22831	22905	22930
Number of firms	2412	2412	2412	2412	2412
R-sq.	0.005	0.003	0.000	0.001	0.002

*Notes: Treatment effects on the treated. Firms need to be observed at least once before and once after the UTSA. A 13 years window around the UTSA is used for the regressions. Standard errors are robust and clustered at the state level. * p < 0.1, ** p < 0.05, *** p < 0.01.*

Table A21. Fixed effects stacked regressions: strength of UTSA as main independent variable (no covariates), including covariates

	(1) Any Acquisition	(2) Domestic Majority	(3) Foreign Majority	(4) Domestic Minority	(5) Foreign Minority
UTSA Strength	0.085***	0.041***	0.004*	0.019***	0.026***
	(0.011)	(0.006)	(0.002)	(0.005)	(0.005)
Assets	0.019***	0.010***	0.002**	0.004***	0.004***
	(0.003)	(0.002)	(0.001)	(0.001)	(0.001)
Sales growth	0.000	-0.000	-0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
R&D	0.001	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
R&D Dummy	-0.003	-0.000	-0.001	-0.002	-0.000
	(0.005)	(0.004)	(0.001)	(0.003)	(0.002)
Patents	-0.000*	0.000	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Citations	0.000*	0.000	-0.000	0.000	0.000**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Co-patents	0.036	-0.008	-0.001	0.064	-0.020***
	(0.079)	(0.016)	(0.002)	(0.074)	(0.005)
IDD	0.000	0.003	-0.001	-0.006*	0.003
	(0.007)	(0.006)	(0.001)	(0.003)	(0.003)
CNC	-0.014*	-0.009	-0.003***	-0.004**	-0.001
	(0.008)	(0.006)	(0.001)	(0.002)	(0.003)
Bus. comb. laws	0.013**	-0.000	0.003	0.006**	0.005***
	(0.005)	(0.003)	(0.002)	(0.003)	(0.002)
GDP growth	-0.001***	-0.000	-0.000*	-0.000*	-0.000**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Constant	-0.015	-0.004	0.006	0.000	-0.014
	(0.046)	(0.032)	(0.006)	(0.011)	(0.014)
Observations	23391	23020	22831	22905	22930
Number of firms	2412	2412	2412	2412	2412
R-sq.	0.003	0.001	0.000	0.001	0.001

*Notes: Treatment effects on the treated. Firms need to be observed at least once before and once after the UTSA. A 13 years window around the UTSA is used for the regressions. Standard errors are robust and clustered at the state level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.*

Table A22. Fixed effects stacked regressions: states with no business combination laws

	(1) Any Acquisition	(2) Domestic Majority	(3) Foreign Majority	(4) Domestic Minority	(5) Foreign Minority
Post-UTSA	0.055***	0.022***	0.005***	0.012***	0.018***
	(0.005)	(0.003)	(0.001)	(0.003)	(0.003)
Observations	13718	13495	13399	13452	13464
Number of firms	1881	1881	1881	1881	1881
R-sq.	0.005	0.000	0.000	0.002	0.002

*Notes: Treatment effects on the treated. Firms need to be observed at least once before and once after the UTSA. A 13 years window around the UTSA is used for the regressions. The regressions include firm and state level controls. For the firm level controls: the log of total assets, sales growth. R&D/assets, a binary variable indicating whether the firm had positive R&D investment, patent stock over R&D expenditures, citation stock over patent stock, and co-patent stock over patent stock. For the state level controls: IDD, CNC, business combination laws and the states' GDP growth. Standard errors are robust and clustered at the state level. * p < 0.1, ** p < 0.05, *** p < 0.01.*

Table A23. Fixed effects stacked regressions for the unmatched full sample

	(1) Any Acquisition	(2) Domestic Majority	(3) Foreign Majority	(4) Domestic Minority	(5) Foreign Minority
Post-UTSA	0.058***	0.029***	0.006***	0.012***	0.014***
	(0.003)	(0.002)	(0.000)	(0.001)	(0.002)
Observations	107391	105271	103636	103926	104056
Number of firms	10800	10765	10659	10656	10662
R-sq.	0.000	0.000	0.000	0.000	0.000

*Notes: Treatment effects on the treated. Firms need to be observed at least once before and once after the UTSA. A 13 years window around the UTSA is used for the regressions. Standard errors are robust and clustered at the state level. * p < 0.1, ** p < 0.05, *** p < 0.01.*

Table A24. Fixed effects stacked regressions for the unmatched full sample, including covariates

	(1) Any Acquisition	(2) Domestic Majority	(3) Foreign Majority	(4) Domestic Minority	(5) Foreign Minority
Post-UTSA	0.037***	0.020***	0.003***	0.007***	0.009***
	(0.006)	(0.003)	(0.001)	(0.002)	(0.003)
Assets	0.018***	0.010***	0.002***	0.003***	0.002***
	(0.002)	(0.001)	(0.000)	(0.000)	(0.001)
Sales growth	-0.000	-0.000	-0.000	-0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
R&D	0.001*	0.001*	0.000***	0.000*	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
R&D dummy	-0.004	-0.001	-0.000	-0.001	-0.002
	(0.002)	(0.002)	(0.001)	(0.002)	(0.001)
Patents	0.000	0.000	-0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Citations	0.000**	0.000	0.000*	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Co-patents	-0.001***	-0.001***	-0.000	0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
IDD	0.002	0.001	-0.000	-0.002	0.003
	(0.006)	(0.004)	(0.001)	(0.001)	(0.003)
CNC	-0.012**	-0.006*	-0.002**	-0.003***	-0.002*
	(0.005)	(0.003)	(0.001)	(0.001)	(0.001)
Bus. comb. laws	0.016**	0.003	0.003***	0.004*	0.007**
	(0.008)	(0.003)	(0.001)	(0.002)	(0.003)
GDP growth	-0.001***	-0.001***	-0.000***	-0.000***	-0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Constant	-0.005	-0.008	0.001	0.002	0.001
	(0.024)	(0.016)	(0.005)	(0.004)	(0.005)
Observations	107391	105271	103636	103926	104056
Number of firms	10800	10765	10659	10656	10662
R-sq.	0.001	0.001	0.000	0.000	0.000

*Notes: Treatment effects on the treated. Firms need to be observed at least once before and once after the UTSA. A 13 years window around the UTSA is used for the regressions. Standard errors are robust and clustered at the state level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.*

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