Venture Capital Investments and Merger and Acquisition Activity around the World[*]

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Abstract

We examine the relation between venture capital (VC) investments and merger and acquisition (M&A) activity in 48 countries around the world. We find evidence of a strong positive association between VC investments and lagged M&A activity, consistent with the hypothesis that an active M&A market provides viable exit opportunities for VC companies and therefore incentivizes them to engage in more deals. We also explore the effects of country-level pro-takeover legislation passed internationally (positive shocks), and U.S. state-level antitakeover business combination laws (negative shocks), on VC activity. We find significant post-law changes in VC activity. VC activity intensifies after enactment of country-level takeover friendly legislation and decreases following passage of state antitakeover laws in the U.S.

Keywords: Venture Capital, Mergers and Acquisitions, Merger Waves, Takeover Laws.

JEL Classification Numbers: G15, G24, G33

1. Introduction

Venture capital funding is important for many small innovative firms, allowing them to survive and prosper. In this paper, we study the interaction of the merger market with venture capital in a sample of 48 countries around the world. We thus extend Megginson (2004) who discusses the globalization of the venture capital markets, as we examine the interaction of the M&A market with venture capital around the world. The impact of mergers on innovation overall is a large topic of debate. Many government agencies and academic scholars worry that the M&A market may hinder the incentives for innovation.[1] In particular, the Department of Justice and the Federal Trade Commission have challenged many mergers based on the concern that mergers destroy the incentives to innovate. In a recent paper, Gilbert and Green (2015) show that between 2004 and 2014, 33.2% of mergers were challenged due to alleged harm to innovation. Furthermore, starting in 2010, the DOJ and FTC formally and explicitly addressed innovation in their merger guidelines.[2] Waller and Sag (2015) also emphasize the importance of considering post-merger incentives for future innovation, but argue that a merger can decrease incentives to innovate by removing the threat of outside disruption.

We argue that active M&A markets can increase incentives for innovation investments by making it easier for venture capitalists to monetize their investment by selling their portfolio companies to potential acquirers. We examine VC investments following M&A activity and also VC investments subsequent to passage of pro-takeover and antitakeover legislation. While mergers of firms that are horizontally competing may indeed reduce innovation, general policies where a large firm is prevented from buying a smaller firm may have deleterious effects on the *ex ante* incentives to conduct R&D by the smaller firm, as has been emphasized by Phillips and Zhdanov (2013). This argument is further supported by Bena and Li (2014), who show that large companies with low R&D expenditures are more likely to be acquirers, and argue that synergies obtained from combining innovation capabilities are important drivers of acquisitions.

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[1]See Schulz (2007) for a literature review on mergers and innovation.

[2]These challenges existed in previous periods as well. Gilbert (2007) gives summary statistics that show that in 2000-2003, 38% of the mergers challenged in the U.S. were challenged due to alleged harm to innovation.

We begin our analysis by examining how VC investments in 48 countries over the period of 1985 to 2014 respond to changes in M&A activity, while controlling for other potential determinants of VC activity. Our results confirm that there exists a strong positive association between activity in M&A markets and subsequent investments by VC firms. Thus, we follow Robinson and Sensoy (2016) who examine the cyclicality of cash flows and performance in private equity and VC markets and Balck and Gilson (1998) who examine the link between stock markets and VC markets. We then look deeper into the dynamics of VC and M&A activity and perform additional tests to understand the relation between VC and M&A activity. To begin, we follow Harford (2005) and construct merger wave indicators for both VC and M&A markets. For this purpose, we take the total number of deals in a country-industry and simulate 1000 deal distributions by randomly assigning deals over our time period of 1985-2014. We then calculate the highest two-year transaction concentration from each of the 1000 draws. If the actual number of transactions in a two year period exceeds the 95th percentile from these simulated distributions, that period is identified as a wave. We then examine the joint timing of VC and M&A waves and find that a M&A wave is a strong predictor of a future VC wave within an industry in a country.

While there is a strong correlation between VC activity and lagged M&A activity, it is important to recognize that both VC investments and M&A activity are likely to be driven by common demand shocks and technological changes. We wish to examine if part of venture activity arises from the venture capitalists investing in markets where they anticipate future positive exits through M&A. We are not trying to get rid of all endogeneity concerns but rather are attempting to test if changes to anticipated exits in the M&A market impact venture investments.

We examine whether potential exits through M&A impact venture activity in several different ways. First, we derive proxies for anticipated exits by using past three-year M&A activity and also instrumented M&A activity from acquirers outside of the country. We instrument cross-border M&A activity with local currency depreciations and local treasury rates. Following Erel, Liao, and Weisbach (2012), we argue that a weaker currency makes local

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companies potentially cheaper acquisition targets for foreign investors and hence is likely to have a positive effect on cross-border M&A activity. On the other hand, domestic VC investments may not be affected by the strength of local currency if a currency depreciation is a sign of weakened economic activity. We therefore use local currency depreciation as an instrument for cross-border M&A activity. In further tests, we also exclude industries that produce more tradeable goods. We also use changes in local borrowing rates as an additional instrument for M&A. Harford (2005) has shown that borrowing rates impact M&A activity, however these should have a less direct effect on domestic VC activity as venture capital investments are mainly equity financed. Our results show that instrumented M&A intensity is a strong predictor of future domestic VC deals consistent with an active M&A market translating into more potential exit opportunities for VC investors.

Second, we take advantage of changes to M&A legislation both at a country level as well as at a state level in the United States. Country-level pro-takeover legislation was passed in various countries in our sample in different years with the intention to make M&A markets more attractive. The laws were not passed with the intent of impacting venture capital activity. These law changes thus serve as a natural ground to study the effect of positive shocks to M&A markets on subsequent activity by VC firms. On the contrary, U.S. based state-level antitakeover business combination laws provide an opportunity to study the effect of negative shocks to the feasibility of takeovers.

We follow Lel and Miller (2015) in the examination of the effects of pro-takeover international legislation on firm policies.[3] They focus on managerial discipline and find that following the enactment of country pro-takeover laws, poorly performing firms experience more frequent takeovers and have an increased propensity to replace underperforming CEOs.[4] They also verify that country takeover-friendly laws indeed spur more M&A activity in the country. Our

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[3]The passage of pro-takeover and antitakeover legislation can also impact the business environment, which then can impact venture capital through the takeover market. For example, after the passage of pro-takeover legislations, it is possible that the market for corporate control becomes more active, leading to less agency problems, lower managerial entrenchment and better corporate governance. All these changes may spur more entrepreneurial activity and attract more VC funding to a country as a result. Thus the laws impacting M&A directly can have an impact through entrepreneurs and subsequent VC funding.

[4]See also Bhattacharya and Daouk (2002) on the effect of insider trading laws and their enforcement around the world, Iliev et al (2015) on the effect of international laws (including M&A laws) on shareholder voting

focus is the effect of pro-takeover laws on VC markets. Using a difference-in-difference approach at the country-industry level, we investigate the impact of takeover-friendly legislation on subsequent VC investments.

This analysis compares VC investments in countries that are subject to change in takeover legislation with VC activity in countries that have no such change. In our tests, we control for time-invariant country and industry characteristics by including country and industry fixed effects. Time-varying economic conditions that have a potential effect on VC investments are controlled for by year fixed effects. Our evidence shows increases in VC activity after pro-takeover laws. VC activity grows by about 40-50% more from pre-law periods to post-law periods in countries that enact pro-takeover laws versus those that do not. This evidence provides support for our hypothesis that M&A and VC markets are connected and improvements in M&A legislation spill over to VC markets by creating more viable exit opportunities for VC firms.

Third, we shift our focus to the U.S. and examine the effect of state-level antitakeover business combination laws on VC investments in states that enact such laws. These laws impose a moratorium on certain kinds of transactions (e.g., asset sales, mergers) between a large shareholder and the firm for a period usually ranging between three and five years after the shareholder's stake passes a pre-specified (minority) threshold. These laws are in place in 28 U.S. States in our sample and were passed between 1985 and 1991. We argue that there are multiple channels through which the business combination laws might affect VC investments. First, while intended to protect shareholders from hostile takeovers, business combination laws can potentially increase the cost to the acquiring firm and have a negative effect on M&A markets in general. Second, we argue that takeovers (including hostile ones) can result in more firm creation and hence VC funding as entrepreneurial employees leave to found new start-up companies. In a context of corporate bankruptcy, Babina (2016) shows that employer financial distress accelerates the exit of employees to create start-ups. Atanassov (2013) shows

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and corporate governance, and Lins, Servaes, and Tufano (2010) for an international study of the use of lines of credit versus cash.

that antitakeover laws have a negative effect on firm's innovation as measured by patent grants and citations.

To study the relation between business combination laws and VC activity, we again employ a difference-in-difference methodology and examine the difference in VC deal intensity in the years following an enactment of an antitakeover law in states that pass a law (treatment states) versus those that did not (control states). Consistent with our hypothesis, our results show that both the level and growth of VC intensity declines in treatment states relative to control states after passage of business combination laws.

Overall, our results emphasize the importance of M&A markets for the investment activities of VC firms. As many start-ups rely on VC funding and venture capitalists rely more on exits through acquisitions versus IPOs, our results suggest that active M&A markets have important ex ante incentive effects for generating entrepreneurship and growth. We focus on the ex ante incentive effects, as actual exits via mergers and trade sales represent almost 6x the incidence of IPOs and we show M&A activity is highly persistent.[5] Our results are consistent with an active M&A market providing incentives for venture capitalists to engage in more deals.

Our paper examines the joint dynamics of M&A and VC activities and is therefore related to both the merger literature and the VC literature. To the best of our knowledge, this is the first paper that studies the joint dynamics of both M&A and VC transactions. We go beyond just U.S.-based evidence to provide international evidence on time varying VC and M&A markets. Gompers and Lerner (2004) provide extensive evidence of time-variability of VC investments as well as fund flows to VC firms. Gompers, Kovner, Lerner and Scharfstein (2008) examine the relation between changes in public market signals and VC activity and document wave-like patterns of VC activity in the U.S.. These papers focus solely on the U.S. and do not examine the link between VC activity and acquisition activity. Ewens, Nanda, and Rhodes-Kropf (2018) document the evolution of venture capital practices of funding different types of

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[5]Using Prequin data which has data on exits, we find that mergers and trade sales represent 76.61% of exits versus 13.74% via IPOs. The balance of actual exits were through sales to other GPs or management, private placements and recapitalizations.

innovation. Armour and Cumming (2006) and Jeng and Wells (2000) compare economic and legal determinants of venture capital investments in different countries. Lerner and Schoar (2005) study the effect of legal enforcement on private equity investments. Lerner, Schoar, Sokolinksi, and Wilson (2016) study the activity of angel investors in 21 countries. Our analysis extends the literature by moving beyond U.S. data to examine a sample of 48 different countries around the world. Furthermore, we take advantage of the natural shocks to M&A markets, both positive (country takeover laws) and negative (U.S. state business combination laws), and study what happens to subsequent VC activity.

The remainder of the paper is organized as follows. Section 2 describes our data sources and the main variables that we use in our analysis. In Section 3, we develop our main hypotheses. Section 4 examines the link between M&A and VC markets in a regression framework, and also by using an instrumental variable approach, instrumenting cross-border M&A activity. We also analyze the joint dynamics of VC and M&A waves. In Section 5, we study the effects of country takeover law initiations on subsequent investments by VC firms. Section 6 examines the response of VC investments to state antitakeover laws in the U.S.. We conduct additional robustness checks in section 7. Section 8 concludes.

2. Data and Variables

We combine data from four major sources. We obtain data on venture capital transactions from Thomson Reuters Venture Expert. VC data is very limited before the mid 1980s, and we therefore start our sample in 1985. To ensure that we have a reasonable number of firms in a country for our cross-sectional country-level tests, we drop countries with less than 100 total VC deals recorded in Venture Expert. We follow Gompers et al (2008) and define VC deals at the VC firm - portfolio company level.

We restrict our sample to Venture Capital Deals, defined by Venture Expert as "Venture capital investments that include startup/seed, early, expansion, and later stage deals" made

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by venture focused firms. M&A transaction data come from the Security Data Corporation's (SDC) Mergers and Corporate Transaction database and includes all deals (domestic and cross-border) announced and completed between 1985 and 2014. Similarly to Erel, Liao, and Weisbach (2012) we exclude LBOs, spinoffs, re-capitalizations, self-tender offers, exchange offers, repurchases, partial equity stakes, acquisitions of remaining interest, privatizations, as well as deals in which the target or the acquirer is a government agency.

In our main tests we consider investments in a single portfolio company on the same date as a single VC deal, even if there are multiple VC firms involved. Our results hold if we treat these investments by multiple VC firms as multiple deals (see Table A.4 in the appendix). Because we use IPO activity as a control variable in some of our tests, as IPOs are an additional potential exit route for VC investments, we obtain IPO data also from Security Data Corporation. Table 1 presents the distribution of M&A and VC deals by country.

Insert Table 1 Here

Following Gompers et al. (2008), we also consider unique VC deals by excluding any follow-up financing rounds so every venture capital firm - portfolio company pair appears only once in the sample of unique deals. Note that based on this definition the number of unique deals can be both higher and lower than the number of deals (depending on how many VC firms participate in a single deal and also on the number of financing rounds.) As follows from Table 1, while the majority of VC deals involves financing of U.S.-based companies (about 60% in our sample of unique deals), there is still substantial VC activity outside of the U.S., in particular in Canada, developed European countries (UK, France, Germany) as well as some emerging Asian markets (China, South Korea). Our resulting dataset contains 201,010 venture capital deals, 226,896 unique VC deals (one deal per venture capital firm - portfolio company pair) and 397,871 takeover transactions. On the M&A side, the U.S. again has

the largest number of deals in our dataset (in excess of 187,000 deals or 47.1% of all deals), followed by the UK (12.4%), Canada (5.7%), Germany (4.7%) and France (4.6%).

We collect accounting data for international (U.S.) companies from Worldscope (Compustat) and return data from Datastream (CRSP). While our main variables of interest are related to the dynamics of VC investments, we use these accounting data to construct various control variables that are known to potentially affect M&A and VC activities. We also use the number of public firms in the Worldscope database as a scaling factor in some measures of M&A and VC intensities that we use.

Our joint public firm dataset spans 66,213 firms across 48 countries. Of these firms, 24,466 firms are in the U.S., followed by 5,100 firms in Japan and 4,333 firms in the UK. While COMPU.S.TAT offers comprehensive coverage of public firms throughout our sample, consistent Worldscope coverage for developed countries starts in 1990s and does not start until the early 2000s for many emerging countries (e.g. China).

Figure 1 plots the aggregate numbers of VC and M&A deals in the U.S. and in the rest of the world, by year. In addition to total VC deals we also present unique VC deals, constructed as described above.

Insert Figure 1 Here

As follows from Figure 1, VC activity (as measured by the numbers of both total and unique deals) exhibits similar time patterns in the U.S. and internationally, with a clear peak around the 2000 dotcom bubble and subsequent flattening out with an additional peak in the pre-crisis period and a decline corresponding to the 2008 financial crisis.

We use SIC 2 digit level codes to group firms into industries, resulting in 77 industries. We use this level of aggregation as many countries do not have finer levels of disaggregation. There is still, however, substantial variation in the number of deals within an industry across different countries. To further reduce noise in our estimation, we exclude country-industry-years with

less than three VC deals in our dataset (in appendix Table A.6, we examine all industry-year observations including those industry-year observations with no deals). As expected, some industries have higher populations of entrepreneurial firms and attract more attention from VC firms than others, so the resulting distribution of deals by industries is skewed. The industries with the highest numbers of deals in our sample are "Business Services," "Electronic and Other Electric Equipment," and "Chemical & Allied Products" (including pharmaceutical products). The industries with least VC deals are public administration and utilities industries as well as "Tobacco Products" and "Museums, Botanical, Zoological Gardens." There is also variation in VC activity within industries over time. For example, the number of unique deals in the U.S. "Business Services" industry (sic code 73) grows from 1,123 in 1996 to 3,599 in 2000 (the year when the dot-com bubble burst) and then goes down to 1,477 in 2003. We formally analyze the presence of waves in VC and M&A markets and their joint dynamics in section **??** below.

Given transaction values are very often missing in Venture Expert, we therefore follow Gompers (2008) and use the number of deals to measure M&A and VC intensities. In particular, we use two alternative measures of VC and M&A activity. Our first measure captures the level of those activities and is defined as the total number of deals in a country (or country-industry) scaled by the total number of public firms in that country (country-industry):

$$DEALS\_level_{i,j,t} = N(\text{Deals}_{i,j,t})/N(\text{Public Firms}_{i,j,t}). \tag{1}$$

In equation (**??**) Deals$_{i,j,t}$ is the number of VC (M&A) deals in country i, industry j in year t while Public Firms$_{i,j,t}$ is the number of public firms available in Worldscope (for international data) or CRSP (for U.S. data) in the same country-industry-year. In addition to the measures expressed in levels, we also use the growth in numbers of VC and M&A deals defined as the percentage change in the number of deals from one year to the next in the same country-

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industry:

$$DEALS\_change_{i,j,t} = \frac{N(\text{Deals}_{i,j,t})}{N(\text{Deals}_{i,j,t-1})} - 1. \tag{2}$$

In our empirical analysis below we apply these measures to total VC deals, unique VC deals, and M&A transactions.

3. Interaction of M&A and VC Activity

In this section we describe the main hypotheses we test in this paper. Our main objective in this paper is to shed light on the interaction between VC and M&A markets. We argue that exit through an acquisition provides a viable means for VC firms to monetize their investments in portfolio companies. We focus on the ex ante incentive effects. We use actual exits over the past three years as a forecast of expected exits is the first analysis we undertake, given actual exits for venture captial investments (not including firms that failed or which no exit data can be found) via mergers and trade sales represent almost six times the incidence of IPOs. Using Prequin data which has data on exits, we find that mergers and trade sales represent 76.61% of exits versus 13.74% via IPOs. The balance of actual exits were through sales to other GPs or management, private placements and recapitalizations.

We argue that venture capitalists are more likely to initiate new investments when the M&A market heats up and there are more M&A deals. Active M&A markets transpire into more viable exit opportunities. The challenge is that we recognize that for demand and technological reasons, these two markets may be very related and thus VC investments may respond to these demand and technological changes. We are attempting to ascertain whether, in addition to demand and technological shocks, VC investors also look at the potential for exit from the M&A market and in particular from related strategic buyers. The first hypothesis we examine does not attempt to discern why these markets may be related. The second and third hypotheses and associated tests attempt to identify whether the M&A exit channel has an additional incentive effect as a potential motivation for VC investors.

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HYPOTHESIS 1: *There is a positive association between VC investments and lagged M&A activity.*

While it is useful to establish a relation between M&A and VC markets, a potential concern is that these two types of activity are driven by common economic shocks - both demand and technological. Thus, rather than VC deals responding to improvements in M&A markets, both types of activity might be responding to changes in the underlying economic environment. Our goal is to examine if at least part of venture activity arises from the venture capitalists investing where they anticipate future positive exits through M&A. We are not trying to get rid of all endogeneity concerns but rather are attempting to test if changes to anticipated exits in the M&A market impact venture investments.

We address this issue by using lags in our regression specifications and including time and country fixed effects in our regressions. We also show in our tests that M&A activity at the country-industry level is highly persistent even over a five year window thus for venture investors to use past activity to, at least partially, build a forecast of future exit likelihood is very plausible.

We also perform three additional types of tests. First, we identify waves in both M&A and VC markets as periods of abnormally high activity in those markets and study the relation between those two types of waves. The details on this procedure are presented in section **??** below. Second, we use an instrumental variable approach and instrument cross-border M&A activity with changes in local currency depreciation and local borrowing rates. In the second stage, we examine the relation between domestic VC activity and instrumented cross-border M&A activity.

Third, to further isolate the M&A exit channel, we also exploit legislative changes impacting M&A markets. We take advantage of both positive and negative takeover legislation. On the positive side, we focus on the staggered enactment of country-level pro-takeover laws. Such laws are intended to simplify the takeover process and make country legislation more takeover friendly and therefore induce more M&A activity in the future. As Lel and Miller

(2015) argue, legal changes associated with country M&A laws are significant, because they are passed to foster takeover activity by reducing barriers to M&A transactions and the legal framework applicable to such transactions. However, there is no obvious direct relation between enactment of takeover laws and VC activity. Still, we expect that such laws would have an indirect positive effect on VC investments, as venture capitalists rationally expect the takeover market to heat up following the passage of takeover laws and provide them with more exit opportunities. This conjecture is summarized in Hypothesis 2.

HYPOTHESIS 2: *VC activity intensifies following the passage of country pro-takeover laws.*

On the negative side, we exploit takeover legislation in the form of state antitakeover business combination laws in the U.S. It is likely that business combination laws are exogenous to VC activity because they are outside of the control of VC firms and also as they are often lobbied for by specific large industrial companies. These laws impose a three to five year moratorium on certain types of transactions, such as mergers, divestitures, consolidations, share exchanges, leases, transfers, liquidations, dissolutions, and asset sales between the firm and a large shareholder whose stake in the firm passes a pre-specified threshold. While their focus is on hostile takeovers, state business combination laws can negatively affect the M&A markets in general and therefore make potential exit of VC investors through an acquisition less viable. Furthermore, takeovers (both friendly and hostile) might create incentives for entrepreneurial employees to leave and start their own firms that require funding by VC companies. An antitakeover law would thus negatively affect such entrepreneurial activity. We therefore expect VC activity in a state that passes an antitakeover law to cool down following enactment of that law.

HYPOTHESIS 3: *There is a reduction in VC activity following enactment of state antitakeover laws.*

The key comparison here is to compare states which pass an antitakeover law in a particular year with states which do not pass an antitakeover law in the same year. The staggered implementation of the antitakeover laws was used by Bertrand and Mullainathan (2003) and recently by Giroud and Mueller (2010) and Atanassov (2013).

4. VC investments and M&A activity

4.1. Regressions of VC activity

We first look at the joint dynamics of M&A and VC markets by computing contemporaneous and lagged correlations between measures of M&A and VC activity. Because IPOs represent an alternative exit channel for VC investors, we also include measures of IPO activity in our analysis. We use the measures of M&A, VC, and IPO intensities expressed in both levels and changes, as specified by equations (**??**) and (**??**). Following Gompers et al (2008), we construct a measure of unique VC deals (by excluding any follow up financing rounds from the same VC firm in the same portfolio company). Table 2 reports correlations at the country-industry level. Panel A presents results for percentage changes in the numbers of deals, while Panel B reports correlations between VC, M&A, and IPO transactions scaled by the number of public firms in the country-industry.

Insert Table 2 Here

The results in Table 2 show that there is a strong positive and statistically significant correlation between VC activity and both contemporaneous and lagged M&A activity. Correlations are positive and significant for measures expressed in levels as well as in changes. For example, contemporaneous (lagged) correlations between percentage growth in VC and M&A deals are 0.094 and 0.051, while similar correlations between the numbers of deals are 0.540 and 0.345, respectively. Negative correlations between contemporaneous and lagged changes in the number of deals (-0.195 for VC deals and -0.138 for M&A transactions) are mechanically driven by scaling our growth measures by the lagged number of deals. Thus, preliminary correlation-based evidence strongly suggests that M&A and VC markets are not independent and there is a strong association between the two markets. Note also, that correlations between current VC and lagged M&A activities are higher than those between current M&A and lagged VC activities, suggesting that in general M&A markets tend to lead. Furthermore, coefficients

on lagged M&A measures are higher than those on lagged IPO measures (in addition, the correlation between VC deal growth and lagged IPO growth is insignificant).

Before examining the relation between VC investments and lagged M&A activity, we first run some preliminary regressions to explore how persistent is M&A activity at the country-industry level over time. The idea is to examine whether M&A activity at the country-industry level is highly persistent over multiple year horizons - including over a five year window. We find that M&A activity is highly persistent. Thus, for venture investors to use past activity to, at least partially, build a forecast of future exit is plausible. We thus regress current M&A activity on lagged M&A activity over 1-year to 5 year windows. We include country and year fixed effects in each specification.

Insert Table 3 Here

The results in Table 3 show that there is a strong positive and statistically significant correlation between current M&A activity and lagged M&A activity for all lagged years, including the five year lag. Coefficients range from .56 for a 1-year lag to .26 for a 5-year lag. Thus, we conclude that using lagged M&A activity to help forecast future exit opportunities is highly plausible.

We now turn our analysis to multivariate tests of the determinants of VC activity. In particular, we adopt the following empirical specification:

$$VC_{i,j,t} = \alpha + \beta MA_{i,j,t-1} + \delta X_{i,j,t-1} + v_t + \varepsilon_{i,j,t}, \tag{3}$$

where $VC_{i,j,t}$ is a measure of VC activity in country i and industry j in year t, $MA_{i,j,t-1}$ is a measure of M&A activity in country i and industry j in year $t-1$, and $X_{i,j,t-1}$ is a vector of control variables. Year fixed effects are included to absorb the potential impact of global time-varying economic conditions. To control for serial correlation, we cluster the standard errors at the country-industry level.

Following Gompers et al (2008), we use country-industry lagged capital expenditures (CAPEX) scaled by total assets (from all public firms with data available in Worldscope /Compustat) and lagged industry median market-to-book ratio as control variables. As they argue, both public market valuations as well as perceived investment opportunities as measured by the market-to-book ratio might trigger response from venture capitalists. Because IPO markets provide an alternative exit channel for VC investors, we also include lagged measures of IPO activity as additional controls.

Table 4 displays results from these VC regressions. In Panel A the dependent variable is based on the level of VC activity as defined in (**??**). In Panel B we use the growth-based measure of VC activity defined in (**??**) as the dependent variable. Our main independent variable of interest, lagged M&A activity, is constructed accordingly in terms of changes in Panel B and in terms of levels in Panel A. In both panels, specifications (1) to (4) are based on all VC deals, while specifications (5) to (8) include unique VC deals only. Because there are potentially large variations in lagged M&A growth, we average M&A growth over the last three years and use it as a dependent variable in Panel C.

Insert Table 4 Here

Results in Table 4 clearly indicate a positive association between various measures of VC intensity and lagged M&A activity, consistent with our main hypothesis that an active takeover market provides more viable exit opportunities for venture capitalists and induces more investment by VC firms. Coefficients on lagged M&A activity are positive and highly statistically significant in all but the last specification in column (8). Columns (4) and (8) have fewer observations as these specifications include the change in IPOs and some countries have had no IPOs and we thus exclude these countries. Coefficients in regressions that include all deals have similar magnitude than those in regressions with only unique deals, suggesting that improvements in the M&A market not only result in more funding of new projects by VC firms, but also induce more follow-up investments by VC firms in their existing portfolio companies.

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Consistent with Gompers et al (2008), who interpret market-to-book ratio as a public signal about an industry's investment opportunities, we find a positive association between lagged industry market-to-book ratios and VC activity. Coefficients on industry market-to-book are positive and significant for level-based measures of VC intensity in Panel B and also significant in some specifications in Panel C that uses three year M&A growth as a regressor. Note that unlike lagged M&A intensity, lagged IPO intensity, while positive, is statistically insignificant in all specifications.

In the appendix (Table A.1) we replicate results in Table 4 while excluding U.S. deals. Table A1 shows that the results in Table 4 are not driven solely by U.S. firms, but similar relations between VC and M&A intensities are found in foreign countries as well. While coefficients on lagged growth in M&A deals in Panel A slightly decline in magnitude and lose significance in some specifications when excluding U.S. data, the corresponding coefficients for level-based measures are highly significant in regressions on international data.

We also conduct additional robustness tests regarding the relation between M&A and VC investments. We show in the appendix in Table A.4 that our results still hold if we treat investments by multiple VC firms as multiple deals. In Table A.4, we also consider whether our results are driven by M&A exits providing capital to new VC funds, and exclude first time funds as these VC firms may potentially be funded by M&A exits. The positive relation between M&A deals and VC investments still remains.

Overall, the results in Table 4 provide further evidence that M&A and VC markets are interrelated and there is a positive association between VC activity and lagged M&A intensity, consistent with Hypothesis 1.

4.2. Analysis of VC and M&A waves

There is a large literature that argues that many corporate types of activity are spread unevenly over time in wave-like patterns.[6] There is also research that focuses on the re-

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[6]See, for example, Gompers et al (2008) for cyclicality of VC investments and Harford (2005) for analysis of merger waves in the U.S., Pastor and Veronesi (2005) for analysis of IPO waves, Harford (2005) and Maksimovic, Phillips and Yang (2013) for private and public merger waves.

lation between various corporate event waves. In particular, Dittmar and Dittmar (2008) study repurchases, equity issuance, and mergers and their response to GDP growth. Rau and Stouraitis (2011) examine the timing patterns of IPOs, SEOs, cash and stock financed acquisitions, as well as stock repurchases. Lyandres, Zhdanov, and Hsieh (2013) present a theory and evidence of the joint dynamics of IPO and M&A activities. Celikyurt, Sevilir, and Shivdasani (2010) and Hovakimian and Hutton (2010) examine various motives for potential relation between M&A and IPO waves.

In this section we follow this literature and complement our results in section **??** by identifying waves in both VC and M&A markets and studying their joint patterns. For the sake of completeness, we construct IPO waves as well. In doing so we follow Harford (2005) and construct wave indicators for VC, M&A, and IPO intensities in the following way. We first take the total number of deals in a country-industry and simulate 1,000 deal distributions by randomly assigning deals over time. We then calculate the highest two-year transaction concentration from each of the 1,000 draws and compare it to the actual concentration in the data. If the actual number of transactions in a two year period exceeds the 95th percentile from these simulated distributions, that period is identified as a wave. To make this analysis meaningful, we remove country-industries with less than 50 total deals and also remove those with time span between the first and last deal of less than 10 years in our data.

This procedure results in a sample of 7,799 country-industry years of VC activity, of which 1,168 years are identified as belonging to a wave, and 6,631 being outside of a wave. Activity in M&A markets appears less volatile with only 865 country-industry years identified as wave years. The wave-like pattern of VC activities appears to materialize in most countries in our sample, however with some variation. Among countries with at least 200 industry-years in our dataset, the ones with the highest percentage of waves are Sweden, South Korea, China, and the United States (with overall percentage of wave years between 19.2% and 20.5%) while the countries with the most stable VC market as measured by the presence of waves are Italy, Netherlands, and Japan (percentage of wave years between 9.2% and 10.9%). There is also considerable variation in the formation of waves in different industries (aggregated across

countries). Business Services, Oil and Gas Extraction, and Electronic Equipment Industries have the most variability of VC activity as measured by the percentage of wave years, while Hotels, Furniture and Fixtures, and Home Furniture, Furnishings, And Equipment Stores have the least variability (among industries with at least 100 country-years).

To examine the relation between M&A and VC waves, we use a logistic regression specification akin to that in (??) whereby the dependent variable is a dummy for a VC wave in a country-industry in a given year, and the main explanatory variable is a lagged M&A wave dummy in the same country-industry. As before, we include year fixed effects and cluster standard errors by country-industry. We also include an industry's lagged median market-to-book ratio, lagged median CAPEX scaled by total assets, and lagged IPO wave dummy as control variables. Because we identify VC waves as periods of abnormally high two-year VC activity, there is a positive serial correlation in VC wave dummies, and we therefore also include the lagged VC wave dummy as an additional control variable.

Insert Table 5 Here

The results from these tests are presented in Table 5. The table shows that there is a strong positive association between contemporaneous and lagged VC waves. These results persist when including the lagged IPO wave variable. More importantly, coefficients on the lagged M&A wave dummy are also positive and highly significantly related to the probability of a VC wave. Unconditionally, an M&A wave in the previous year implies a probability of about 45% of having a VC wave in the next year. Conditional on observing a VC wave in the previous year, the existence of an M&A wave in that year increases the probability of having a VC wave in the current year as well by about 19%. Note that the predictive ability of lagged IPO waves is much weaker. The coefficients on the lagged IPO wave dummy are lower and statistically only marginally insignificant. In the appendix, we replicate this analysis while excluding U.S. deals and find very similar results (see Table A.3).

This evidence suggests that while there is clustering across time in both VC and M&A

markets, VC and M&A waves, as well as IPO waves, tend to occur around the same time. Past M&A waves are a much stronger predictor of future VC waves than are IPO waves. This result yields additional support for Hypothesis 1 and further highlights the connectedness of M&A and VC markets.

4.3. Instrumenting cross-border M&A activity

While results in sections ?? and ?? strongly suggest that more active M&A markets lead to intensified VC activity in the future, a potential concern is that both types of activity might be simultaneously driven by an exogenous economic shock and that venture investors do not incorporate anticipated M&A exits when making investments. We partially alleviated this concern by including time fixed effects in our regressions and also lagging M&A activity.

In this section, we derive a proxy for anticipated exits through M&A by using past instrumented cross-border M&A activity as a measure of predicted M&A activity and relate this to domestic within-country VC activity. We use two instruments motivated by previous literature.[7] Our first instrument is the lagged three-year change in local currency exchange rates. Erel, Liao, and Weisbach (2012) examine the determinants of cross-border mergers and find, among other things, that the change in the exchange rate between the acquirer and target countries' currencies prior to the merger is positively related to the probability of a merger. When the local currency in the target nation depreciates relative to that of the acquirer's nation, an acquisition becomes a more attractive deal from the valuation perspective. We therefore argue that a weaker currency makes local companies potentially cheaper acquisition targets for foreign acquirers and hence is likely to have a positive effect on cross-border M&A activity. On the other hand, domestic VC investments are unlikely to be directly affected by the strength of local currency, because when local currency depreciates, local VC companies become subject to the same valuation shock. Table A.7 shows the results with just the change in foreign currency exchange rates. Our second instrument is the change in local currency

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[7]We estimate the results with each instrument separately and show that we have get similar results in Table A.7 and Table A.8, so the tests are not reliant on using both instruments together or one specific instrument.

borrowing rates. Harford (2005) has shows that local currency borrowing rates are a good predictor of M&A and we argue that given that venture investments are largely financed with equity, VC investors do not use borrowing rates to evaluate venture investments.

We obtain local currency rates and local short-term treasury rates for the 48 countries in our dataset from Thompson Reuters Datastream. In our tests, we include year fixed effects to account for potential exogenous shocks that might affect both VC investments and M&A deals. We also cluster standard errors at the country level to control for potential serial correlation in residuals. Because cross-border M&A activity might be sensitive to the GDP growth in the target country, we include it as a control variable. As in (??) we include lagged median market-to-book ratio and lagged median investment in the target country as additional controls. In this exercise we do not focus on a particular acquirer country but argue that local currency depreciation is likely to attract more transactions from foreign acquirers in general. We therefore proxy for the local currency weakness by its depreciation relative to the United States dollar in the previous three years. As before, we examine the effect of instrumented cross-border M&A activity on measures of VC intensity based on both total and unique VC deals. The results from this IV approach are presented in Table 6.

Insert Table 6 Here

Table 6 presents results for both for all VC deals and also for unique VC deals. We estimate the equations with both two-stage OLS and also using GMM. For all specifications, the instrumented cross-border M&A activity is positive and significant when used to predict the total volume of domestic VC deals (Columns 1 and 3) in the target country as well as the volume of unique VC deals (Columns 2 and 4).

It is possible that some exporters might naturally benefit from local currency depreciation as their costs decrease if measured in foreign currencies while the output price in foreign markets is likely unaffected by domestic currency fluctuations. For this reason, we repeat our

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tests while excluding firms in natural resource extraction and manufacturing industries (SIC codes 1000-3999). Results remain significant and similar, demonstrating the robustness of our instrumental variable approach to excluding portfolio companies from industries that are more tradeable.

In the appendix, we also present results with each instrument separately, with the change in the currency exchange rates as Table A.7 and the change in local treasury rates as Table A.8. The results show that instrumented cross-boarder M&A activity remains significant and positive for each instrument separately. The results throughout are consistent with our main premise that an increase in M&A activity spurs more investment by VC firms as there is a higher expectation of a viable exit through an acquisition in the future.

5. The effect of country takeover laws on VC activity

To further examine the effect of M&A markets on the incentives of venture capitalists to engage in new deals and to further alleviate potential endogeneity concerns, we take advantage of the natural variation in takeover legislation that change M&A markets in different countries. In particular, we exploit staggered enactment of takeover legislation, both pro-takeover and antitakeover acts. Takeover acts are laws passed specifically to foster takeover activity by reducing barriers to mergers and acquisition transactions. As Lel and Miller (2015) state, "They (country takeover laws) are aimed at reducing informational uncertainties regarding the legal framework applicable to M&A transactions, thus simplifying the application of various laws in connection with M&A transactions and streamlining M&A procedures."

The country-level takeover laws provide a natural way to further alleviate potential endogeneity concerns as long as they are passed by countries and are not driven by the VC industry. Lel and Miller (2015) study the effect of takeover laws on managerial discipline and CEO turnover. They find that following the passage of takeover laws, poorly performing firms experience more frequent takeovers and the propensity to replace poorly performing CEOs

increases. Importantly for our analysis, they also found that the merger intensity increased after initiation of M&A laws and particularly so for cross-border M&A transactions. We focus on the role of takeover laws in stimulating VC activity. As M&A conditions improve following enactment of those laws in different countries, we expect more investment by VC firms in those countries as they anticipate more viable exit opportunities through a takeover.

The passage of pro-takeover and antitakeover laws can also impact the business environment but this channel would operate through the takeover market. For example, after the passage of pro-takeover legislations, it is possible that the market for corporate control becomes more active, leading to less agency problems, lower managerial entrenchment and better corporate governance. All these changes may spur more entrepreneurial activity and attract more VC funding to a country as a result. Thus, the laws impacting M&A directly can have an impact through entrepreneurs and subsequent VC funding.

Table 7 shows the list of countries in our data that passed a takeover law sometime during the time span of our sample. Unfortunately, many developed countries passed a takeover law before 1985 (when our VC dataset starts), rendering enactment of such laws inadequate for our analysis. Some other countries (e.g. France and China) have not yet passed a takeover law.

While different across countries, the takeover laws have provisions aimed at simplifying M&A transactions and fostering acquisition activity. For example, the 2002 Merger and Acquisition Act in Taiwan provided some general amendments to the Company Act to simplify the M&A process, introduced more types of mergers including cash-out mergers and cross-border mergers, as well as provided some tax incentives to neutralize the transaction costs associated with M&A deals. The Merger Act passed in 2004 in Switzerland regulates the civil law aspects of mergers in a broad comprehensive framework, significantly facilitating acquisition deals, which used to be governed by Swiss corporate law and had to be carried out through a series of complicated transactions, often triggering unfavorable tax consequences and formal liquidation procedures. In the case of Germany, the 2002 Takeover Act introduced

formal provisions governing acquisition of publicly traded companies. As Strelow and Wild-berger (2002) argue, prior to the passage of the act, takeovers of public companies had not often been considered an option worth pursuing. Table A.10 provides additional details about the specific features of takeover laws in different countries.

Insert Table 7 Here

To capture the effect of takeover laws on VC activity, we adopt a difference-in-difference methodology and define a POSTLAW dummy that indicates whether or not the country has a takeover law by year t. We set the POSTLAW dummy to one in the years following the enactment of takeover law in a country and set it to zero in the years before the enactment year and in all years in countries with no takeover law. Our empirical specification has the following form:

$$VC_{i,j,t} = \alpha + \beta POSTLAW_{i,t} + \delta X_{i,j,t-1} + v_t + \eta_i + \zeta_j + \varepsilon_{i,j,t}, \tag{4}$$

where $VC_{i,j,t}$ is a measure of VC activity in country i and industry j in year t as in **??**, $POSTLAW_{i,t}$ indicates whether a takeover law had been passed in country i by year $t-1$, and $X_{i,j,t-1}$ is a vector of control variables. We include year fixed effects v_t to absorb the potential impact of global time-varying economic conditions. We also include country η_i and industry ζ_j fixed effects to account for potential exogenous drivers of VC activity at the country and industry level. To control for potential serial correlation in residuals, we cluster the standard errors at the country-industry level. As in our tests in section **??** we include median industry market-to-book ratio and median industry investment as control variables.

It is also possible that VC investors find industries with a higher population of small firms potentially more attractive. Thus VC investment decisions may sensitive to an industry's competitive structure. Thus, we also include median industry size and industry concentration as measured by the Herfindahl-Hirschman index constructed from sales. Lastly, we also include

two time dummy variables that indicate years one and two prior to the enactment of takeover laws to see if there is any time pre-trends in VC activity in pre-takeover law years. Finding such a trend would potentially undermine the causal relation between takeover laws and VC intensity.

The empirical specification in equation **??** allows us to gauge the incremental effect of takeover law adoption on VC activity in countries that passed a takeover law (treatment countries) relative to those that did not (control countries). Furthermore, because different countries pass takeover laws at different times, the same country can act as both a treatment (if it already passed a law) and a control (if it did not). Performing this analysis at the industry level allows us to control for industry-level variables potentially related to the level of VC activity. Furthermore, industry fixed effects control for industry-specific unobservable differences.

The results from these tests are presented in Table 8. Panel A presents results for the measure of VC activity based on the total number of deals, while in Panel B the dependent variable includes only unique VC deals.

Insert Table 8 Here

The results in Table 8 demonstrate that enactment of pro-takeover laws has a favorable effect on subsequent VC activity in the country. Coefficients on the $POSTLAW$ dummy are positive and significant in most specifications (and marginally significant in the others). This effect is common to the measures of VC activity based on both total and unique deals. Economically, the effect of $POSTLAW$ dummy on VC activity is high - depending on the specification, a passage of a takeover law in a country leads to a 40%-50% increase in the VC intensity relative to countries that have not passed a takeover law. Overall these results render strong support for Hypothesis 2.

In addition, the results indicate that there are more takeover deals in industries with a smaller median size and more concentrated industries. Coefficients on the two $PRELAW$

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dummies are insignificant, suggesting that there is no evidence of a trend in VC activity in the two years prior to enactment of takeover laws.

Overall, the results in Table 8 demonstrate a positive response of VC investments to a positive shock to M&A markets in the form of pro-takeover law enactment and yield strong support for Hypothesis 2.

6. VC activity and state antitakeover laws

While country-level pro-takeover laws provide a natural setting to test for the effect of positive exogenous shocks to M&A markets on venture capital investments, in this section we also take advantage of the state level shocks to M&A environment in the U.S.. In particular, we focus on state antitakeover laws in the U.S. and their effect on VC activity.

State business combination laws impose a moratorium on certain kinds of transactions (e.g., asset sales, mergers) between a large shareholder and the firm for a period usually ranging between three and five years after the shareholder's stake passes a pre-specified (minority) threshold. We argue that there are multiple channels through which the business combination laws might affect VC investments. First, while intended to protect shareholders from hostile takeovers, business combination laws can potentially increase the cost to the acquiring firm and therefore have a negative effect on M&A markets in general. Second, we argue that takeovers (including hostile ones) can result in more firm creation and hence VC funding as entrepreneurial employees leave to found new start-up companies. In a context of corporate bankruptcy, Babina (2016) shows that employer financial distress accelerates the exit of employees to create start-ups. Atanassov (2013) shows that antitakeover laws have a negative effect on a firm's innovation as measured by patent grants and citations. Phillips and Zhdanov (2013) show that an active acquisition market creates more incentives for firms to conduct R&D.

Atanassov (2013) studies the effect of state business combination antitakeover laws on innovation and finds a significant decline in the number of patents and citations per patent

for firms incorporated in states that pass antitakeover laws relative to firms incorporated in states that do not. This is consistent with Phillips and Zhdanov (2013) who argue that there is a positive association between firms' innovation incentives and the friendliness of M&A markets. In this section we extend his analysis by focusing on the effect of business combination antitakeover laws on VC investments in portfolio companies domiciled in the states that pass those laws. We expect that the general connectedness of M&A and VC markets should lead to fewer VC deals in such states for the reasons discussed above.

We follow Atanassov (2013) in constructing a sample of state antitakeover laws. The dates of these laws are summarized in Table 9. Out of the 50 states and the District of Columbia, 28 states passed an antitakeover law at some point in time. Other states never passed a business combination law. Most states passed those laws in late 1980s, with New York being the first state in our sample that passed a law (in 1985), and Nevada and Oklahoma being the last (both states passed antitakeover laws in 1991).

We believe that business combination laws are exogenous to VC activity because they are most likely outside of control of VC firms and also because they are often lobbied for by a specific company. For example, as pointed out by Romano (1987), in Connecticut the antitakeover law was promoted by Aetna, while in Arizona it was lobbied for by Greyhound.

We start our analysis by aggregating VC deals in U.S.-based portfolio companies by state, resulting in a sample of 1,726 state-years. There is considerable dispersion in the VC activity across the states. Not surprisingly, states with most VC deals in our sample are California and Massachusetts (40,054 and 11,678 deals, respectively), followed by New York (6,746 deals) and Texas (5,917 deals), while the states with least deals are Alaska and Wyoming (4 and 14 deals, respectively). As before, to reduce the noise in the computation of the growth in VC deals, we remove state-year observations with less than five deals. This further reduces our sample to 1,126 state-years.

To formally test for the effect of business combination laws on subsequent VC intensity, we define a $POSTLAW$ dummy, which we set equal to one in the years following the year of

the law enactment in a state and set it to zero in the years prior to the enactment year. As in the previous section, we use a difference-in-difference methodology and estimate the following regression model:

$$VC_{i,t} = \alpha + \beta POSTLAW_{i,t} + \delta X_{i,t-1} + v_t + \varepsilon_{i,t}, \tag{5}$$

where $VC_{i,t}$ is a measure of VC activity in state i in year t, $X_{i,t-1}$ is a vector of (lagged) control variables (aggregated at the state level), and v_t are year fixed effects included to control for aggregate shocks to VC markets. We cluster standard errors by state to control for potential serial correlation in residuals. We use two measures of VC intensity - based on levels as in (??) and based on changes as in (??). Because in this section we are interested in the dynamics of VC deals at the state level, we measure growth in VC deals also at the state level.

Results from the state-level regressions of VC activity on the postlaw dummy are presented in Table 10. In Panel A we use our VC growth measure defined in (??) as the dependent variable. In Panel B the dependent variable is based on the level of VC activity as defined in (??). In both panels, regression specifications (1) and (3) use the percentage growth in all VC deals in the state as the dependent variable, while Specifications (2) and (4) include only unique VC deals.

Insert Table 10 Here

The results in Table 10 demonstrate that VC activity indeed slows down following enactments of state business combination laws in states that pass a law relative to those that do not. Coefficients on the $POSTLAW$ dummy are negative and statistically significant in most specifications when controlling for size and pre-law dummies. The effect is also economically large. For example, the number of deals scaled by the number of public firms in the state declines by about 27% in post antitakeover years in states that enact an antitakeover law relative to those that do not enact such a law.

In the robustness section we also examine the effect of two other state antitakeover laws:

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control share acquisitions laws and fair price laws and find consistent results (see table A.12).

Overall, consistent with our Hypothesis 3, we see a negative association between enactment of state-level antitakeover business combination laws in the U.S. and subsequent VC activity. This provides further evidence on the connectedness of M&A and VC markets.

7. Robustness

We perform a battery of checks to confirm the robustness of our main results from Tables 2-6 of the paper. We discuss these results here but in the interest of space these results are reported in the appendix.

7.1. Excluding U.S. deals

A considerable number of VC deals are in the United States. In order to examine whether our results are not driven by the U.S. deals, we perform the same analysis as in Table 4 while excluding U.S. VC transactions. The results from these international tests are reported in Table A.1. These results are consistent with our main results reported in Table 3. Coefficients on lagged M&A activity are highly statistically significant in most specifications (marginally significant in some). The magnitude of coefficients is also similar (and slightly higher for non-U.S. data).

We also replicate our analysis of VC waves while excluding U.S. transactions. The results from these tests are presented in Table A.3 and are very similar to the main results reported in Table 5. Lagged M&A waves are still a strong and highly significant predictor of VC waves. In contrast, coefficients on the lagged IPO, while positive, are statistically insignificant.

7.2. VC experience

We examine if VC firms that do multiple deals rely more on lagged M&A investments when making investment. Table A.2 reports results from industry regressions of VC intensity on lagged M&A intensity. We split the VC firms into two groups by their number of investments. Panel A presents results for more experienced VC firms (with the number of previous investments above the median). Panel B presents results for less experienced VC firms (with the number of previous investments below the median). Median number of previous investments varies by year with the time-series mean (median) of 12.1 (14).

The results show that lagged M&A activity only is significantly related to current VC investments for VC firms with the most experience where the number of investments by the VC firm is above the sample median. Results are consistent with more experienced VC firms using more more information about potential exits in particular country-industries in deciding where to invest.

7.3. Alternative deal definition

In our main tests we consider investments by multiple VC firms in the same portfolio company on the same date as a single deal. To check the robustness of our results to this definition we replicate our main tests while treating investments by multiple VC firms as multiple deals (so we can see multiple deals for the same portfolio company on a single date). The results are presented in Table A.4 and show the robustness of our main results to this alternative definition of VC deals. Coefficients on lagged M&A activity are positive and highly statistically significant in all specifications, both in level-based and change-based regressions.

7.4. Excluding new funds

One potential concern might be that prior exits via M&A may release capital that flows into new VC funds, leading to a positive relation between VC activity and past M&A activity that we document. To alleviate this concern we repeat our analysis while excluding any funds

that first appear in our database within one year prior to the transaction. The results from this test are reported in Table A.5 and are consistent with our main results.

7.5. Including all country-industry years

In most of our tests we only include country-industry years where there are VC investments. In Table A.6 we include all observations including country-industry years with no deals as zero values. The reported results in Table A.6 are consistent with our main results.

7.6. Including horizontal mergers only

It is conceivable that horizontal mergers (that involve a target and an acquirer from the same industry) are more relevant for VC professionals as they typically seek to sell out to a firm in the same line of business. For this reason we replicate our main results while including only takeover transactions in which the target and the aquirer belong to the same 2-digit SIC industry. The results from these tests are reported in Table A.9 and are generally very similar to our base case results in Table 4. Coefficients on lagged changes in M&A activity are similar in magnitude (and statistically significant in most specifications) while coefficients on lagged levels of M&A activity are higher (and also highly statistically significant).

7.7. Excluding acquisitions of public targets

It is possible that investment by VC firms might be less sensitive to acquisitions of private targets. Obviously, portfolio companies of VC firms are private firms and, as shown by Maksimovic et al. (2013), acquisitions of private and public targets respond differently to various economic conditions like credit spreads and aggregate market valuations. We therefore replicate our main tests while excluding acquisitions of public targets and focus just on private firm takeovers. The corresponding results are reported in table A.10. These results are similar in magnitude and significance to our base case results reported in Table 4.

7.8. Takeover laws tests with VC firms that invest in at least two countries

VC firms with greater geographical outreach are likely to have more capacity to shift resources from one country to another as the investment and M&A climate in those countries changes. (This is not to say that domestic VC firms are not likely to increase their activity following enactment of takeover friendly laws.) As an additional robustness test, we therefore examine the effect of country takeover laws on investments by VC firms while only including firms that have historically invested in at least two countries. Thus we exclude all deals made by firms that have focused on a single country. The results from this test are presented in table A.12. The coefficients on the takeover law dummies remain statistically significant (albeit slightly lower in magnitude).

7.9. Specific state-level antitakeover laws

We examine two specific state antitakeover laws separately: control share acquisitions laws and fair price laws. Table A.13 reports results from state level regressions of VC intensity on different components of these two state antitakeover laws. Panel A use the control share acquisition laws and Panel B uses fair price laws. Each of these is set equal to one after the antitakeover law is enacted. Results show that both of these laws have a significant negative relation to subsequent VC activity.

8. Conclusions

We study how venture capital investments are related to past M&A activity in 48 countries around the world. Our paper is the first to study the relation between VC and M&A markets domestically and internationally. We show that there is a strong positive association between venture capital and lagged M&A activity around the world. We argue that growth in M&A deals in a country is likely to attract more investments by VC firms as venture capitalists anticipate more viable future exit opportunities via a takeover. Consistent with this intuition,

we first demonstrate a strong positive relation between VC activity and lagged M&A intensity. We reinforce this evidence by forming a measure of predicted M&A by instrumenting cross-border M&A intensity with the currency depreciation in the target country and local borrowing rates. We show that this measure of predicted cross-border M&A activity is associated with subsequent VC activity. We also examine the time patterns of VC and merger waves and document a strong association between the VC activity and merger waves.

We further show that takeover legislation has a subsequent impact on VC activity to further isolate the M&A channel on VC activity. We exploit legislative changes to the ability and costs of undertaking M&A both internationally and in the U.S. We take advantage of both positive and negative changes to the ability to undertake takeovers through government legislation. We examine pro-takeover legislation internationally and state-level antitakeover legislation in the U.S. on subsequent VC activity. Following Lel and Miller (2015), we argue that an enactment of a country pro-takeover law represents a positive shock to M&A activity. On the other hand, the passage of a state antitakeover law in the U.S. can be interpreted a negative shock that is likely to reduce M&A activity in that state. We show that subsequent VC activity responds to both types of shocks. First, the passage of a pro-takeover law in a country is associated with more subsequent VC deals in that country, while the enactment of a business combination antitakeover law in the U.S. has a negative effect on subsequent VC investment in that state.

Overall, our results highlight the importance of M&A markets for the incentives to engage in VC. As many start-ups rely on VC funding and venture capitalists rely on acquisitions for subsequent exits, our results suggest that an active M&A market is important for encouraging venture capital investments, entrepreneurship and growth.

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Figure 1
VC and M&A activities in the US and abroad

This figure presents the numbers of VC deals (both total and unique) and the numbers of M&A deals over time. Graphs of VC activities are presented for deals in the US and the rest of the world.
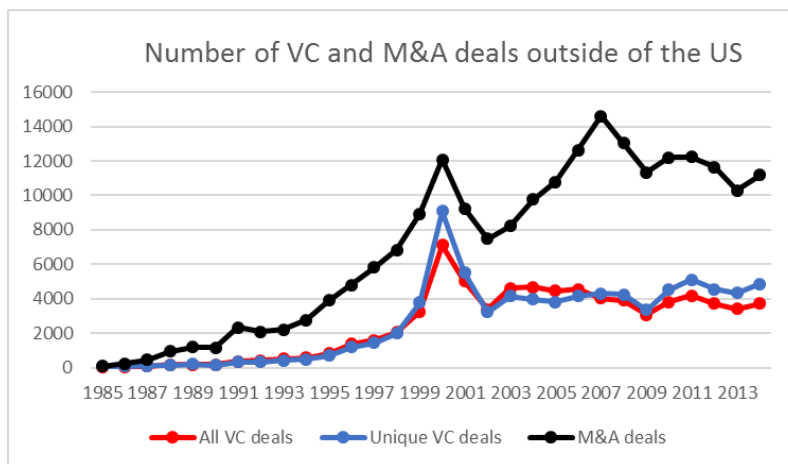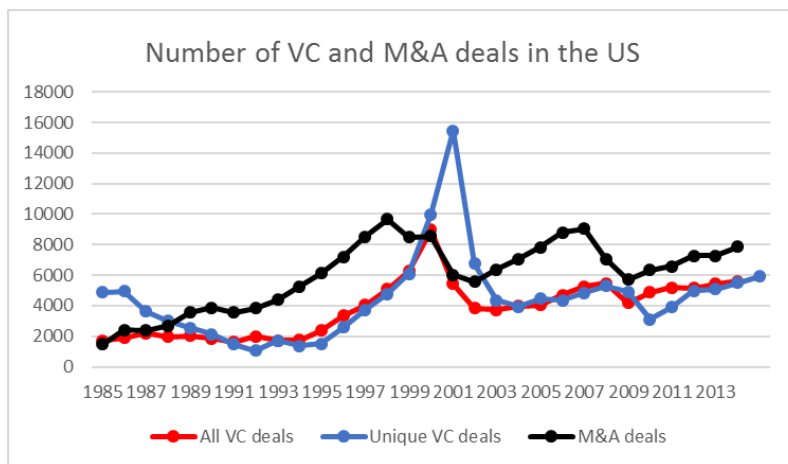
Table 1

Table 1 presents the numbers of all VC deals, and takeover transactions by country. The sample period is 1985-2014.

Country	Number of VC deals	Number of unique VC deals	Number of M&A deals
Argentina	128	160	495
Australia	2355	1832	13178
Austria	534	592	970
Belgium	923	1163	1934
Bermuda	99	84	86
Brazil	772	835	2645
Canada	15512	12595	22608
China	8241	11475	9513
Czech Republic	139	117	184
Denmark	1180	1116	2436
Egypt	59	69	81
Finland	1947	1683	2726
France	7142	9328	18297
Germany	5092	6566	18663
Hong Kong	471	565	2787
Hungary	214	195	307
India	3758	4101	4136
Indonesia	112	160	235
Ireland	1037	1198	1030
Israel	1848	2653	703
Italy	940	1046	5298
Japan	1744	2338	12835
Kenya	820	98	28
Luxembourg	90	92	142
Malaysia	190	214	2157
Mexico	117	141	411
Morocco	48	49	41
Netherlands	1601	1641	5683
New Zealand	240	233	1147
Nigeria	98	104	48
Norway	775	746	2143
Poland	547	437	1138
Portugal	569	459	548
Romania	135	118	230
Russia	581	684	4056
Singapore	713	904	1699
South Africa	171	194	966
South Korea	4053	4247	2866
Spain	1600	1843	6744
Sweden	2618	2623	5920
Switzerland	961	1212	2759
Taiwan	509	624	413
Thailand	145	155	233
Turkey	93	108	460
United Kingdom	9289	10030	49217
United States	121338	139846	187709
Utd. Arab Em.	89	110	215
Vietnam	111	113	111
Total	201010	226896	397871

Table 2

CONTEMPORANEOUS AND LAGGED CORRELATIONS OF VC AND M&A ACTIVITIES.

Table 2 reports contemporaneous and lagged correlations between VC, M&A, and IPO activities. *% change in VC deals /% change in M&A deals /% change in IPO deals* is the difference between the number of VC /M&A /IPO deals in the current and previous years divided by the total number of deals in the previous year. *Scaled VC deals /Scaled M&A deals /Scaled IPO deals* is the number of VC /M&A /IPO deals divided by the total number of public firms in the same industry-year in the Worldscope (for international companies) and Compustat (for US companies) databases.

Panel A. Percentage growth in deals.

	% change in VC deals	% change in VC deals (t-1)	% change in unique VC deals	% change in unique VC deals (t-1)	% change in M&A deals	% change in M&A deals (t-1)	% change in IPO deals	% change in IPO deals (t-1)
% change in VC deals	1.000							
% change in VC deals (t-1)	-0.195 (0.000)	1.000						
% change in unique VC deals	0.708 (0.000)	-0.159 (0.000)	1.000					
% change in unique VC deals (t-1)	-0.105 (0.000)	0.738 (0.000)	-0.194 (0.000)	1.000				
% change in MA deals	0.094 (0.000)	0.039 (0.005)	0.089 (0.000)	0.018 (0.201)	1.000			
% change in MA deals (t-1)	0.051 (0.000)	0.092 (0.000)	0.061 (0.001)	0.086 (0.000)	-0.138 (0.000)	1.000		
% change in IPO deals	0.079 (0.001)	-0.016 (0.516)	0.092 (0.000)	-0.032 (0.190)	0.052 (0.025)	-0.012 (0.608)	1.000	
% change in IPO deals (t-1)	0.028 (0.252)	0.085 (0.000)	0.009 (0.701)	0.089 (0.000)	0.074 (0.001)	0.083 (0.001)	-0.144 (0.000)	1.000

Panel B. Number of deals.

	Scaled VC deals	Scaled VC deals (t-1)	Scaled unique VC deals	Scaled unique VC deals (t-1)	Scaled M&A deals	Scaled M&A deals (t-1)	Scaled IPO deals	Scaled IPO deals(t-1)
Scaled VC deals	1.000							
Scaled VC deals (t-1)	0.601 (0.000)	1.000						
Scaled unique VC deals	0.973 (0.000)	0.557 (0.000)	1.000					
Scaled unique VC deals (t-1)	0.594 (0.000)	0.975 (0.000)	0.590 (0.000)	1.000				
Scaled M&A deals	0.540 (0.000)	0.276 (0.000)	0.543 (0.000)	0.285 (0.000)	1.000			
Scaled M&A deals (t-1)	0.345 (0.000)	0.571 (0.000)	0.353 (0.000)	0.576 (0.000)	0.606 (0.000)	1.000		
Scaled IPO deals	0.314 (0.000)	0.336 (0.000)	0.305 (0.000)	0.334 (0.000)	0.322 (0.000)	0.307 (0.000)	1.000	
Scaled IPO deals(t-1)	0.276 (0.000)	0.314 (0.000)	0.254 (0.000)	0.306 (0.000)	0.196 (0.000)	0.327 (0.000)	0.675 (0.000)	1.000

Table 3

PERSISTENCE OF COUNTRY-INDUSTRY M&A ACTIVITY

Table 3 reports regressions of the M&A activity on past M&A activity at the country-industry level. *Scaled M&A deals* is the number of M&A deals divided by the total number of public firms in the same industry-year in the Worldscope (for international companies) and Compustat (for US companies) databases. Standard errors are clustered by country-industry, year and country fixed effects are included.

VARIABLES	(1) Scaled M&A deals	(2) Scaled M&A deals	(3) Scaled M&A deals	(4) Scaled M&A deals	(5) Scaled M&A deals
Scaled M&A deals (t-1)	0.560*** (0.076)				
Scaled M&A deals (t-2)		0.472*** (0.114)			
Scaled M&A deals (t-3)			0.307*** (0.100)		
Scaled M&A deals (t-4)				0.385*** (0.074)	
Scaled M&A deals (t-5)					0.263** (0.123)
Observations	4,897	4,395	3,957	3,572	3,224
R-squared	0.411	0.331	0.222	0.236	0.176
Year fixed effects	Yes	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes

Table 4
Country-Industry level regressions of VC intensity.

Table 4 reports results from country-industry regressions of VC intensity on lagged M&A intensity. *% change in VC deals* is the difference between the numbers of VC deals in the current and previous years divided by the number of deals in the previous year. *% change in M&A deals (t-1)* is lagged percentage growth in the number of M&A transactions in a country-industry year. *Industry Capex/TA (t-1)* is the lagged industry CAPEX scaled by total assets. *Industry Market-to-Book (t-1)* is lagged industry market-to-book ratio. *% change in unique VC deals* is the percentage growth in the number of unique VC deals. *Scaled VC deals (Scaled M&A deals)* is the number of VC (M&A) deals divided by the total number of public firms in the same industry-year in the Worldscope (for international companies) and Compustat (for US companies) databases. Standard errors are clustered by country-industry, year fixed effects are included.

Panel A. Dependent variable - number of deals scaled by the number of public firms

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Scaled VC deals	Scaled VC deals	Scaled VC deals	Scaled VC deals	Scaled unique VC deals	Scaled unique VC deals	Scaled unique VC deals	Scaled unique VC deals
Scaled M&A deals (t-1)	0.132*** (0.042)	0.134*** (0.044)	0.114*** (0.042)	0.068 (0.046)	0.150*** (0.050)	0.154*** (0.051)	0.126*** (0.048)	0.077 (0.053)
Industry Capex/TA (t-1)		-0.196 (1.804)	-0.772 (1.715)	-3.398 (2.149)		-1.406 (1.790)	-1.887 (1.739)	-4.061* (2.355)
Industry Market-to-Book (t-1)			0.089** (0.044)	0.248** (0.107)			0.128** (0.054)	0.355*** (0.135)
Scaled IPO deals (t-1)				0.108 (0.144)				0.064 (0.115)
Observations	4,897	4,878	4,838	2,172	4,814	4,796	4,759	2,150
R-squared	0.280	0.283	0.273	0.300	0.290	0.294	0.285	0.319
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Panel B. Dependent variable - growth in VC deals

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	% change in VC deals	% change in VC deals	% change in VC deals	% change in VC deals	% change in unique VC deals	% change in unique VC deals	% change in unique VC deals	% change in unique VC deals
% change in M&A deals (t-1)	0.042** (0.017)	0.050** (0.021)	0.051** (0.022)	0.109** (0.042)	0.086*** (0.026)	0.088*** (0.029)	0.088*** (0.029)	0.062 (0.055)
Industry Capex/TA (t-1)		0.236 (0.231)	0.741 (0.686)	0.262 (1.038)		0.616** (0.286)	0.616** (0.286)	0.349 (1.587)
Industry Market-to-Book (t-1)			0.001*** (0.001)	0.015 (0.023)				0.037 (0.023)
% change in IPOs (t-1)				0.016 (0.022)				0.013 (0.030)
Observations	5,589	5,113	5,039	1,611	5,310	4,867	4,867	1,585
R-squared	0.061	0.058	0.059	0.088	0.045	0.046	0.046	0.097
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Panel C. Using past 3-year growth in M&A deals.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	% change in VC deals	% change in VC deals	% change in VC deals	% change in VC deals	% change in unique VC deals	% change in unique VC deals	% change in unique VC deals	% change in unique VC deals
lagged 3 year % change in MA deals	0.089*** (0.021)	0.089*** (0.023)	0.087*** (0.023)	0.054 (0.036)	0.081*** (0.031)	0.070** (0.028)	0.067** (0.028)	0.103** (0.044)
Industry Capex/TA (t-1)		0.489 (0.511)	0.628 (0.524)	-0.714 (0.484)		0.019 (0.711)	0.204 (0.725)	-1.809*** (0.557)
Industry Market-to-Book (t-1)			0.001*** (0.000)	0.022 (0.021)			0.005*** (0.000)	0.041* (0.024)
% change in IPOs (t-1)				-0.002 (0.029)				0.017 (0.036)
Observations	4,248	4,004	3,977	1,439	4,079	3,848	3,822	1,416
R-squared	0.055	0.052	0.053	0.090	0.042	0.042	0.046	0.117
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table 5
WAVES IN VC AND M&A ACTIVITIES.

Table 5 reports results from logistic regressions of the VC wave dummies on lagged M&A and IPO wave dummies. *Industry Capex/TA (t-1)* is lagged industry CAPEX scaled by total assets. *Industry Market-to-Book (t-1)* is lagged industry market-to-book ratio. Standard errors are clustered by country-industry, year and country fixed effects are included. See Section 4.2 for details on construction of VC, M&A, and IPO waves.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	VC wave	VC wave	VC wave	VC wave	VC wave	VC wave	VC wave	VC wave
Lagged M&A wave	0.481*** (0.031)	0.191*** (0.026)	0.260*** (0.039)	0.480*** (0.057)	0.188*** (0.044)	0.481*** (0.057)	0.189*** (0.044)	0.269*** (0.030)
Lagged VC wave		0.575*** (0.021)	0.651*** (0.023)		0.573*** (0.033)		0.573*** (0.034)	0.652*** (0.032)
Lagged IPO wave			0.081* (0.045)					0.091* (0.052)
Industry Capex/TA (t-1)				-0.000 (0.305)	0.142 (0.169)	0.053 (0.344)	0.204 (0.222)	0.234 (0.277)
Industry Market-to-Book (t-1)						-0.001 (0.003)	0.000 (0.002)	0.004 (0.007)
Observations	4,301	4,301	2,145	4,025	4,025	3,984	3,984	1,982
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table 6

INSTRUMENTAL VARIABLE APPROACH WITH GMM ESTIMATION

Table 6 reports results from two-stage IV regressions while using both instruments - change in the local treasury rates and local currency depreciation to instrument cross-border M&A deals. Columns (1) and (2) report results from the 2SLS estimation, columns (3) and (4) report results from the GMM estimation. The dependent variables are domestic total (unique) VC deals. Year fixed effects are included, standard errors are clustered by country.

	2SLS		GMM	
	(1)	(2)	(3)	(4)
	Scaled VC deals	Scaled unique VC deals	Scaled VC deals	Scaled unique VC deals
Instrumented CB M&A, lagged	0.217***	0.169***	0.262***	0.205***
	(0.051)	(0.037)	(0.086)	(0.071)
Median market-to-book	0.006**	0.004**	-0.003	-0.002
	(0.003)	(0.002)	(0.008)	(0.006)
Median Investment	-33.136	-21.888	-24.573	-17.059
	(24.406)	(18.374)	(25.944)	(20.428)
GDP growth	0.198	0.168*	0.156	0.137*
	(0.122)	(0.101)	(0.097)	(0.082)
Observations	491	489	491	489
	0.180	0.146	0.034	0.032
Year fixed effects	Yes	Yes	Yes	Yes

Table 7

Table 7 reports the list of countries that passed a takeover law between 1980 and 2011.

Country	Year of takeover law
Austria	1998
Belgium	1989
Germany	2002
Finland	1989
India	1997
Indonesia	1998
Italy	1992
Ireland	1997
Malaysia	1998
New Zealand	1993
Spain	1991
Sweden	1991
Switzerland	2004
South Africa	1991
Taiwan	2002

Table 8

VC REGRESSIONS AND COUNTRY TAKEOVER LAWS

Table 8 reports results from industry regressions of VC intensity on the *POSTLAW* dummy. *POSTLAW* dummy is set to one if there was a takeover law in the country before, and to zero otherwise. *Sales HHI (t-1)* is lagged Herfindahl index constructed from sales. *Industry Capex/TA (t-1)* is the lagged industry CAPEX scaled by total assets. *Industry Market-to-Book (t-1)* is lagged industry market-to-book ratio. *Median industry size (t-1)* is the lagged median industry size. *Prelaw t(-1)* dummy is set to one in the year preceding the takeover law year and to zero otherwise. *Prelaw t(-2)* dummy is set to one in the year two years prior to the takeover law year and to zero otherwise. Country, industry, and year fixed effects included. Standard errors are clustered by country-industry.

Panel A. All VC deals.

	(1)	(2)	(3)	(4)	(5)	(6)
	Scaled VC deals	Scaled VC deals	Scaled VC deals	Scaled VC deals	Scaled VC deals	Scaled VC deals
Postlaw dummy	0.501*	0.463***	0.514***	0.656**	0.505***	0.564***
	(0.258)	(0.169)	(0.183)	(0.277)	(0.175)	(0.186)
Sales HHI (t-1)			1.238***			1.239***
			(0.284)			(0.284)
Industry Capex/TA (t-1)		2.883	2.984		2.891	2.994
		(3.443)	(3.406)		(3.445)	(3.408)
Industry Market-to-Book (t-1)		0.020	0.018		0.020	0.018
		(0.030)	(0.028)		(0.030)	(0.028)
Median industry size (t-1)		0.038	0.083*		0.038	0.083*
		(0.046)	(0.045)		(0.046)	(0.045)
Prelaw t(-1) dummy				0.358	0.129	0.133
				(0.261)	(0.163)	(0.181)
Prelaw t(-2) dummy				0.464	0.108	0.149
				(0.305)	(0.144)	(0.152)
Observations	4,865	3,870	3,870	4,865	3,870	3,870
R-squared	0.250	0.282	0.288	0.250	0.282	0.288
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes

Panel B. Only unique VC deals.

	(1)	(2)	(3)	(4)	(5)	(6)
	Scaled unique VC deals	Scaled unique VC deals	Scaled unique VC deals	Scaled unique VC deals	Scaled unique VC deals	Scaled unique VC deals
Postlaw dummy	0.697** (0.307)	0.551** (0.225)	0.607** (0.240)	0.818*** (0.316)	0.586*** (0.225)	0.660*** (0.238)
Sales HHI (t-1)			1.236*** (0.304)			1.237*** (0.305)
Industry Capex/TA (t-1)		2.497 (3.423)	2.499 (3.396)		2.502 (3.425)	2.506 (3.398)
Industry Market-to-Book (t-1)		0.022 (0.019)	0.021 (0.018)		0.022 (0.019)	0.021 (0.018)
Medium industry size (t-1)		0.038 (0.047)	0.084* (0.045)		0.038 (0.047)	0.084* (0.045)
Prelaw t(-1) dummy				0.168 (0.293)	0.107 (0.195)	0.132 (0.206)
Prelaw t(-2) dummy				0.488 (0.334)	0.102 (0.174)	0.176 (0.172)
Observations	5,535	4,308	4,308	5,535	4,308	4,308
R-squared	0.239	0.278	0.283	0.239	0.278	0.283
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes

Table 9

Table 9 presents the years of enactment of business combination laws by state.

State	Year of law enactment
Alabama	-
Alaska	-
Arizona	1987
Arkansas	-
California	-
Colorado	-
Connecticut	1989
District of Columbia	-
Delaware	1988
Florida	-
Georgia	1988
Hawaii	-
Idaho	1988
Illinois	1989
Indiana	1986
Iowa	-
Kansas	1989
Kentucky	1987
Louisiana	-
Maine	1988
Maryland	1989
Massachusetts	1989
Michigan	1989
Minnesota	1987
Mississippi	-
Missouri	1986
Montana	-
Nebraska	1988
Nevada	1991
New Hampshire	
New Jersey	1986
New Mexico	-
New York	1985
North Carolina	-
North Dakota	-
Ohio	1990
Oklahoma	1991
Oregon	-
Pennsylvania	1989
Rhode Island	1990
South Carolina	1988
South Dakota	1990
Tennessee	1988
Texas	-
Utah	-
Vermont	-
Virginia	1988
Washington	1987
West Virginia	-
Wisconsin	1987
Wyoming	1989

Table 10

STATE-LEVEL REGRESSIONS ON STATE ANTITAKEOVER LAW DUMMY

Table 10 reports results from state level regressions of VC intensity on the *POSTLAW* dummy. *POSTLAW* dummy is set to one in a state after the antitakeover law is enacted. *Median CAPEX/TA (t-1)* is the lagged median firm CAPEX scaled by total assets in the state. *Median Market-to-Book (t-1)* is lagged median market-to-book ratio. *Median size (t-1)* is the lagged median firm size. Year fixed effects are included, errors are clustered by state.

Panel A. Dependent variable number of VC deals scaled by number of public firms in a state.

	(1)	(2)	(3)	(4)	(5)	(6)
	Scaled VC deals	Scaled unique VC deals	Scaled VC deals	Scaled unique VC deals	Scaled VC deals	Scaled unique VC deals
Postlaw dummy	-0.226*	-0.262*	-0.251**	-0.285**	-0.253**	-0.288**
	(0.117)	(0.147)	(0.110)	(0.133)	(0.111)	(0.134)
Median CAPEX/TA (t-1)			-4.737**	-6.500***	-4.745**	-6.510***
			(1.830)	(2.153)	(1.823)	(2.136)
Median Market-to-Book (t-1)			0.196	0.179	0.196	0.180
			(0.213)	(0.323)	(0.213)	(0.324)
Median Size (t-1)			0.000	0.000	0.000	0.000
			(0.000)	(0.000)	(0.000)	(0.000)
Prelaw t(-1) dummy					-0.117*	-0.197*
					(0.059)	(0.105)
Prelaw t(-2) dummy					-0.046	-0.124
					(0.061)	(0.116)
Observations	1,084	1,083	1,084	1,083	1,084	1,083
R-squared	0.296	0.240	0.328	0.276	0.329	0.277
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes

Panel B. Dependent variable growth in the number of VC deals.

	(1)	(2)	(3)	(4)	(5)	(6)
	% change in VC deals	% change in unique VC deals	% change in VC deals	% change in unique VC deals	% change in VC deals	% change in unique VC deals
Postlaw dummy	-0.141** (0.055)	-0.169** (0.073)	-0.129** (0.054)	-0.159** (0.075)	-0.130** (0.056)	-0.160** (0.076)
Median CAPEX/TA (t-1)			0.413 (1.445)	1.086 (1.783)	0.419 (1.448)	1.088 (1.779)
Median Market-to-Book (t-1)			-0.193** (0.081)	-0.217 (0.147)	-0.195** (0.082)	-0.218 (0.148)
Median Size (t-1)			0.000 (0.000)	-0.000 (0.000)	0.000 (0.000)	-0.000 (0.000)
Prelaw t(-1) dummy					0.006 (0.215)	-0.019 (0.254)
Prelaw t(-2) dummy					-0.225 (0.144)	-0.108 (0.150)
Observations	1,095	1,088	1,095	1,088	1,095	1,088
R-squared	0.253	0.244	0.263	0.249	0.264	0.249
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes

Internet Appendix for

"Venture Capital Investments and Merger and Acquisition Activity around the World"
(*Not for publication*)

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Table A1

INTERNATIONAL NON-US VC INTENSITY.

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Table A1 reports results from country-industry level regressions of VC intensity on lagged M&A intensity using international data only (excluding the US). *% change in VC deals* is the difference between the numbers of VC deals in the current and previous years divided by the number of deals in the previous year. *% change in M&A deals (t-1)* is lagged percentage growth in the number of M&A transactions. *Industry Capex/TA (t-1)* is the lagged industry CAPEX scaled by total assets. *Industry Market-to-Book (t-1)* is lagged industry market-to-book ratio. *% change in unique VC deals* is the percentage growth in the number of unique VC deals. *Scaled VC deals (Scaled M&A deals)* is the number of VC (M&A) deals divided by the total number of public firms in the same industry-year in the Worldscope database. Standard errors are clustered by country-industry, year fixed effects are included.

Panel A. Dependent variable - growth in VC deals

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	% change in VC deals	% change in VC deals	% change in VC deals	% change in VC deals	% change in unique VC deals	% change in unique VC deals	% change in unique VC deals	% change in unique VC deals
% change in M&A deals (t-1)	0.041* (0.022)	0.053** (0.027)	0.055* (0.028)	0.091* (0.052)	0.070* (0.036)	0.069* (0.041)	0.069* (0.041)	0.029 (0.061)
Industry Capex/TA (t-1)		0.493 (0.842)	0.719 (1.037)	-0.012 (1.638)		0.995 (1.194)	0.995 (1.194)	0.542 (2.529)
Industry Market-to-Book (t-1)			0.013** (0.006)	-0.006 (0.022)				0.023 (0.026)
% change in IPOs (t-1)				0.013 (0.027)				0.017 (0.039)
Observations	3,567	3,207	3,145	877	3,421	3,076	3,076	865
R-squared	0.093	0.094	0.097	0.123	0.073	0.076	0.076	0.115
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Panel B. Dependent variable - number of deals scaled by the number of public firms.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Scaled VC deals	Scaled VC deals	Scaled VC deals	Scaled VC deals	Scaled unique VC deals	Scaled unique VC deals	Scaled unique VC deals	Scaled unique VC deals
Scaled M&A deals (t-1)	0.313*** (0.056)	0.310*** (0.057)	0.290*** (0.065)	0.202** (0.084)	0.393*** (0.070)	0.393*** (0.071)	0.357*** (0.076)	0.271*** (0.100)
Industry Capex/TA (t-1)		2.940 (2.831)	2.433 (2.879)	-0.242 (3.735)		1.641 (2.937)	1.155 (2.945)	-0.446 (4.140)
Industry Market-to-Book (t-1)			0.142* (0.076)	0.278* (0.156)			0.244** (0.096)	0.465** (0.196)
Scaled IPO deals (t-1)				0.209 (0.197)				0.181 (0.177)
Observations	2,919	2,905	2,874	1,191	2,890	2,876	2,846	1,183
R-squared	0.156	0.158	0.146	0.168	0.171	0.173	0.167	0.193
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table A2 reports results from industry regressions of VC intensity on lagged M&A intensity. *Scaled VC deals (Scaled M&A deals)* is the number of VC (M&A) deals divided by the total number of public firms in the same industry-year in the Worldscope (for international companies) and Compustat (for US companies) databases. Panel A presents results for more experienced VC firms (with the number of previous investments above the median). Panel B presents results for less experienced VC firms (with the number of previous investments below the median). Standard errors are clustered by country-industry, country and year fixed effects are included.

Panel A. More experienced VC firms

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Scaled VC deals	Scaled VC deals	Scaled VC deals	Scaled VC deals	Scaled unique VC deals	Scaled unique VC deals	Scaled unique VC deals	Scaled unique VC deals
Scaled M&A deals (t-1)	0.160*** (0.048)	0.160*** (0.047)	0.163*** (0.059)	0.120* (0.072)	0.158*** (0.048)	0.160*** (0.048)	0.154*** (0.058)	0.115 (0.072)
Industry Capex/TA (t-1)		-0.418 (1.989)	-1.350 (1.819)	-3.369* (2.005)		-1.466 (1.607)	-2.181 (1.493)	-3.691** (1.861)
Industry Market-to-Book (t-1)			0.069 (0.063)	0.201* (0.117)			0.093 (0.072)	0.276** (0.133)
Scaled IPO deals (t-1)				0.077 (0.144)				0.033 (0.115)
Observations	3,612	3,600	3,580	1,828	3,547	3,535	3,516	1,808
R-squared	0.312	0.308	0.301	0.316	0.337	0.335	0.323	0.343
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Panel B. Less experienced VC firms

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Scaled VC deals	Scaled VC deals	Scaled VC deals	Scaled VC deals	Scaled unique VC deals	Scaled unique VC deals	Scaled unique VC deals	Scaled unique VC deals
Scaled M&A deals (t-1)	0.025 (0.025)	0.027 (0.024)	0.012 (0.024)	0.034 (0.024)	0.041 (0.037)	0.044 (0.035)	0.026 (0.037)	0.074 (0.051)
Industry Capex/TA (t-1)		-2.314 (1.846)	-1.728 (1.608)	-2.165 (1.675)		-3.420 (2.398)	-2.947 (2.114)	-3.334 (2.331)
Industry Market-to-Book (t-1)			0.063 (0.051)	0.154** (0.066)			0.095 (0.068)	0.210** (0.093)
Scaled IPO deals (t-1)				-0.118* (0.066)				-0.192 (0.122)
Observations	1,305	1,303	1,298	883	1,303	1,301	1,296	882
R-squared	0.448	0.449	0.409	0.453	0.446	0.449	0.416	0.451
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table A3

WAVES IN VC AND M&A ACTIVITIES USING NON-US DATA

Table A3 reports results from logistic regressions of the VC wave dummies on lagged M&A and IPO wave dummies on international data only. *Industry Capex/TA* is lagged industry CAPEX scaled by total assets. *Industry Market-to-Book (t-1)* is lagged industry market-to-book ratio. Standard errors are clustered by country-industry, year and country fixed effects are included. See Section 4 for details on construction of VC, M&A, and IPO waves.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	VC wave	VC wave	VC wave	VC wave	VC wave	VC wave	VC wave	VC wave
Lagged M&A wave	0.442*** (0.031)	0.164*** (0.030)	0.224*** (0.050)	0.442*** (0.043)	0.159*** (0.033)	0.443*** (0.044)	0.160*** (0.034)	0.240*** (0.028)
Lagged VC wave		0.588*** (0.024)	0.637*** (0.030)		0.586*** (0.037)		0.585*** (0.038)	0.639*** (0.029)
Lagged IPO wave			0.043 (0.056)					0.048 (0.056)
Industry Capex/TA (t-1)				0.142 0.142	0.257 0.257	0.259 0.259	0.388 0.388	0.415 0.415
Industry Market-to-Book (t-1)						0.000 (0.003)	0.001 (0.002)	0.004 (0.008)
Observations	2,672	2,672	1,148	2,444	2,444	2,413	2,413	998
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table A4
Aggregating Investments: Country-industry regressions of VC intensity

Table A4 reports results from country-industry regressions of VC intensity on lagged M&A intensity while treating investments by multiple VC firms in the same portfolio company as multiple deals. *% change in VC deals* is the difference between the numbers of VC deals in the current and previous years divided by the number of deals in the previous year. *% change in M&A deals (t-1)* is lagged percentage growth in the number of M&A transactions. *Industry Capex/TA (t-1)* is the lagged industry CAPEX scaled by total assets. *Industry Market-to-Book (t-1)* is lagged industry market-to-book ratio. *% change in unique VC deals* is the percentage growth in the number of unique VC deals. *Scaled VC deals (Scaled M&A deals)* is the number of VC (M&A) deals divided by the total number of public firms in the same industry-year in the Worldscope (for international companies) and Compustat (for US companies) databases. Standard errors are clustered by country-industry, year fixed effects are included.

Panel A. Dependent variable - growth in VC deals.

	(1)	(2)	(3)	(4)
	% change in VC deals	% change in VC deals	% change in VC deals	% change in VC deals
% change in M&A deals (t-1)	0.072***	0.071***	0.072***	0.124**
	(0.025)	(0.027)	(0.028)	(0.055)
Industry Capex/TA (t-1)		0.874**	1.833	1.060
		(0.404)	(1.219)	(2.060)
Industry Market-to-Book (t-1)			0.002	0.026
			(0.001)	(0.023)
% change in IPOs (t-1)				(0.026)
				(0.022)
Observations	5,590	5,114	5,040	1,611
R-squared	0.043	0.043	0.045	0.083
Year fixed effects	Yes	Yes	Yes	Yes

Panel B. Dependent variable - number of deals scaled by the number of public firms.

	(1)	(2)	(3)	(4)
	Scaled VC deals	Scaled VC deals	Scaled VC deals	Scaled VC deals
Scaled M&A deals (t-1)	0.343***	0.343***	0.302***	0.209*
	(0.085)	(0.087)	(0.087)	(0.112)
Industry Capex/TA (t-1)		2.777	1.709	-0.883
		(2.907)	(2.920)	(3.876)
Industry Market-to-Book (t-1)			0.286***	0.542***
			(0.095)	(0.208)
Scaled IPO deals (t-1)				0.337
				(0.282)
Observations	4,897	4,878	4,838	2,172
R-squared	0.125	0.127	0.127	0.169
Year fixed effects	Yes	Yes	Yes	Yes

Table A5

VC INTENSITY - EXCLUDING NEW FUNDS

Table A5 reports results from country-industry regressions of VC intensity on lagged M&A intensity while excluding new funds (those that first appear in our sample within a 12 month window.) *% change in VC deals* is the difference between the numbers of VC deals in the current and previous years divided by the number of deals in the previous year. *% change in M&A deals (t-1)* is lagged percentage growth in the number of M&A transactions. *Industry Capex/TA (t-1)* is the lagged industry CAPEX scaled by total assets. *Industry Market-to-Book (t-1)* is lagged industry market-to-book ratio. *% change in unique VC deals* is the percentage growth in the number of unique VC deals. *Scaled VC deals (Scaled M&A deals)* is the number of VC (M&A) deals divided by the total number of public firms in the same industry-year in the Worldscope database. Standard errors are clustered by country-industry, year fixed effects are included.

Panel A. Dependent variable - growth in VC deals.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	% change in VC deals	% change in VC deals	% change in VC deals	% change in VC deals	% change in unique VC deals	% change in unique VC deals	% change in unique VC deals	% change in unique VC deals
% change in M&A deals (t-1)	0.070***	0.081***	0.083***	0.129**	0.103***	0.107***	0.107***	0.093
	(0.024)	(0.030)	(0.031)	(0.065)	(0.029)	(0.033)	(0.033)	(0.075)
Industry Capex/TA (t-1)	(0.024)	(0.030)	(0.031)	(0.065)	(0.029)	(0.033)	(0.033)	(0.075)
		(0.233)	(0.779)	(1.129)		(0.282)	(0.282)	(1.728)
Industry Market-to-Book (t-1)			0.002**	0.039*				0.066**
			(0.001)	(0.022)				(0.029)
% change in IPOs (t-1)				0.015				0.017
				(0.025)				(0.035)
Observations	5,117	4,703	4,636	1,533	4,868	4,484	4,484	1,504
R-squared	0.067	0.065	0.066	0.088	0.052	0.051	0.051	0.097
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Panel B. Dependent variable - number of deals scaled by the number of public firms.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Scaled VC deals	Scaled VC deals	Scaled VC deals	Scaled VC deals	Scaled unique VC deals	Scaled unique VC deals	Scaled unique VC deals	Scaled unique VC deals
Scaled M&A deals (t-1)	0.196***	0.194***	0.168***	0.116*	0.227***	0.226***	0.194***	0.142**
	(0.050)	(0.050)	(0.051)	(0.063)	(0.056)	(0.056)	(0.055)	(0.069)
Industry Capex/TA (t-1)		2.762	2.115	0.216		1.916	1.481	0.321
		(1.967)	(1.914)	(2.406)		(1.877)	(1.858)	(2.526)
Industry Market-to-Book (t-1)			0.175***	0.323**			0.238***	0.445***
			(0.067)	(0.139)			(0.076)	(0.155)
Scaled IPO deals (t-1)				0.206				0.189
				(0.180)				(0.166)
Observations	4,495	4,479	4,442	2,036	4,416	4,401	4,367	2,016
R-squared	0.122	0.125	0.122	0.175	0.132	0.133	0.138	0.189
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table A6

VC INTENSITY INCLUDING ALL OBSERVATIONS

Table A6 reports results from country-industry regressions of VC intensity on lagged M&A intensity while including all observations (even those with no deals in a country-industry-year). *% change in VC deals* is the difference between the numbers of VC deals in the current and previous years divided by the number of deals in the previous year. *% change in M&A deals (t-1)* is lagged percentage growth in the number of M&A transactions. *Industry Capex/TA (t-1)* is the lagged industry CAPEX scaled by total assets. *Industry Market-to-Book (t-1)* is lagged industry market-to-book ratio. *% change in unique VC deals* is the percentage growth in the number of unique VC deals. *Scaled VC deals (Scaled M&A deals)* is the number of VC (M&A) deals divided by the total number of public firms in the same industry-year in the Worldscope database. Standard errors are clustered by country-industry, year fixed effects are included.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Scaled VC deals	Scaled VC deals	Scaled VC deals	Scaled VC deals	Scaled unique VC deals	Scaled unique VC deals	Scaled unique VC deals	Scaled unique VC deals
Scaled M&A deals (t-1)	0.106***	0.110***	0.101***	0.066**	0.133***	0.134***	0.120***	0.079**
	(0.027)	(0.028)	(0.028)	(0.030)	(0.035)	(0.035)	(0.033)	(0.034)
Industry Capex/TA (t-1)		-0.421	-0.362	-1.987		-0.757*	-0.994	-2.999**
		(0.481)	(0.796)	(1.310)		(0.455)	(0.895)	(1.478)
Industry Market-to-Book (t-1)			0.002**	0.053**			0.002	0.095***
			(0.001)	(0.023)			(0.001)	(0.029)
Scaled IPO deals (t-1)				0.170				0.141
				(0.158)				(0.137)
Observations	8,803	8,765	8,609	4,403	8,195	8,164	8,027	4,189
R-squared	0.216	0.219	0.211	0.244	0.232	0.234	0.225	0.261
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table A7 reports results from two-stage IV regressions. In the first stage we instrument cross-border M&A deals (scaled by the number of public firms) by the lagged 3-year change in the exchange rate. In the second stage we predict domestic VC deals with lagged instrumented CB M&A deals. Specifications (4) and (5) exclude VC investments in natural resource extraction and manufacturing industries (SIC codes 1000-3999). Year fixed effects are included, standard errors are clustered by country.

		All Industries		Excluding Tradeable Sectors	
	(1)	(2)	(3)	(4)	(5)
	Scaled CB M&A deals	Scaled VC deals	Scaled unique VC deals	Scaled VC deals	Scaled unique VC deals
3-year change in exchange rate	2.562*** (0.719)				
Median market-to-book	-0.002 (0.001)	0.974* (0.544)	0.903* (0.485)	0.661 (0.478)	0.610 (0.439)
Median Investment	9.927 (14.387)	-30.196* (16.722)	-28.012* (15.135)	-22.460* (13.082)	-20.681* (11.862)
GDP growth	0.169*** (0.060)	0.085 (0.060)	0.066 (0.048)	0.059 (0.046)	0.043 (0.036)
Instrumented CB M&A, lagged		0.821*** (0.300)	0.747** (0.282)	0.574*** (0.202)	0.515** (0.188)
Observations	697	596	593	575	571
R-squared	0.121	0.200	0.208	0.182	0.186
Year fixed effects	Yes	Yes	Yes	Yes	Yes

Table A8

Table A8 reports results from two-stage IV regressions. In the first stage we instrument cross-border M&A deals (scaled by the number of public firms) by the change in the local treasury rates. In the second stage we predict domestic VC deals with lagged instrumented CB M&A deals. Year fixed effects are included, standard errors are clustered by country.

	(1)	(2)	(3)
	Scaled CB M&A deals	Scaled VC deals	Scaled unique VC deals
Change in risk-free rate	-0.377** (0.164)		
Median market-to-book	0.019*** (0.003)	0.788** (0.335)	0.670** (0.304)
Median Investment	6.587 (41.893)	-24.665* (12.541)	-21.846* (10.848)
GDP growth	0.590**	0.200** (0.079)	0.178** (0.064)
Instrumented CB M&A, lagged		0.212** (0.300)	0.171** (0.282)
Observations	613	499	495
R-squared	0.131	0.274	0.279
Year fixed effects	Yes	Yes	Yes

Table A9

COUNTRY-INDUSTRY REGRESSIONS OF VC INTENSITY: HORIZONTAL MERGERS ONLY

Table A9 reports results from country-industry regressions of VC intensity on lagged M&A intensity while including horizontal mergers only. *% change in VC deals* is the difference between the numbers of VC deals in the current and previous years divided by the number of deals in the previous year. *% change in M&A deals (t-1)* is lagged percentage growth in the number of M&A transactions. *Industry Capex/TA (t-1)* is the lagged industry CAPEX scaled by total assets. *Industry Market-to-Book (t-1)* is lagged industry market-to-book ratio. *% change in unique VC deals* is the percentage growth in the number of unique VC deals. *Scaled VC deals (Scaled M&A deals)* is the number of VC (M&A) deals divided by the total number of public firms in the same industry-year in the Worldscope database. Standard errors are clustered by country-industry, year fixed effects are included.

Panel A. Dependent variable - growth in VC deals.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	% change in VC deals	% change in VC deals	% change in VC deals	% change in VC deals	% change in unique VC deals	% change in unique VC deals	% change in unique VC deals	% change in unique VC deals
% change in M&A deals (t-1)	0.041** (0.017)	0.040** (0.019)	0.039** (0.019)	0.086** (0.037)	0.062** (0.025)	0.047** (0.023)	0.047** (0.023)	0.062 (0.041)
Industry Capex/TA (t-1)		0.148 (0.172)	0.434 (0.635)	-0.443 (0.539)		0.436** (0.217)	0.436** (0.217)	-0.782 (0.723)
Industry Market-to-Book (t-1)			0.002** (0.001)	0.036* (0.020)				0.063*** (0.024)
% change in IPOs (t-1)				0.003 (0.018)				-0.000 (0.026)
Observations	4,469	4,247	4,207	1,516	4,275	4,066	4,066	1,495
R-squared	0.069	0.067	0.068	0.101	0.056	0.055	0.055	0.115
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Panel B. Dependent variable - number of deals scaled by the number of public firms

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Scaled VC deals	Scaled VC deals	Scaled VC deals	Scaled VC deals	Scaled unique VC deals	Scaled unique VC deals	Scaled unique VC deals	Scaled unique VC deals
Scaled M&A deals (t-1)	0.345*** (0.102)	0.343*** (0.103)	0.310*** (0.104)	0.279** (0.133)	0.437*** (0.127)	0.436*** (0.128)	0.387*** (0.124)	0.379** (0.161)
Industry Capex/TA (t-1)		3.268 (2.182)	2.153 (2.112)	0.229 (2.711)		2.936 (2.344)	1.825 (2.280)	-0.013 (3.019)
Industry Market-to-Book (t-1)			0.167** (0.071)	0.212* (0.116)			0.255*** (0.091)	0.352** (0.143)
Scaled IPO deals (t-1)				0.255 (0.224)				0.242 (0.216)
Observations	4,128	4,118	4,099	2,003	4,067	4,058	4,039	1,985
R-squared	0.111	0.115	0.118	0.177	0.122	0.127	0.138	0.199
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table A10

CDUNTRY-INDUSTRY REGRESSIONS OF VC INTENSITY, EXCLUDING ACQUISITIONS OF PUBLIC TARGETS

Table A10 reports results from industry regressions of VC intensity on lagged M&A intensity while excluding acquisitions of public targets. *% change in VC deals* is the difference between the numbers of VC deals in the current and previous years divided by the number of deals in the previous year. *% change in M&A deals (t-1)* is lagged percentage growth in the number of M&A transactions. *Industry Capex/TA (t-1)* is the lagged industry CAPEX scaled by total assets. *Industry Market-to-Book (t-1)* is lagged industry market-to-book ratio. *% change in unique VC deals* is the percentage growth in the number of unique VC deals. *Scaled VC deals (Scaled M&A deals)* is the number of VC (M&A) deals divided by the total number of public firms in the same industry-year in the Worldscope database. Standard errors are clustered by country-industry, year fixed effects are included.

Panel A. Dependent variable - growth in VC deals.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	% change in VC deals	% change in VC deals	% change in VC deals	% change in VC deals	% change in unique VC deals	% change in unique VC deals	% change in unique VC deals	% change in unique VC deals
% change in M&A deals (t-1)	0.039** (0.017)	0.045** (0.020)	0.046** (0.021)	0.084* (0.045)	0.092*** (0.028)	0.089*** (0.028)	0.089*** (0.028)	0.039 (0.057)
Industry Capex/TA (t-1)		0.231 (0.232)	0.735 (0.694)	0.222 (1.039)		0.622** (0.289)	0.622** (0.289)	0.327 (1.591)
Industry Market-to-Book (t-1)			0.001*** (0.000)	0.014 (0.019)				0.038 (0.023)
% change in IPOs (t-1)				0.015 (0.022)				0.013 (0.030)
Observations	5,523	5,069	4,997	1,605	5,251	4,828	4,828	1,579
R-squared	0.060	0.058	0.059	0.087	0.045	0.046	0.046	0.097
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Panel B. Dependent variable - number of deals scaled by the number of public firms

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Scaled VC deals	Scaled VC deals	Scaled VC deals	Scaled VC deals	Scaled unique VC deals	Scaled unique VC deals	Scaled unique VC deals	Scaled unique VC deals
Scaled M&A deals (t-1)	0.229*** (0.057)	0.228*** (0.058)	0.198*** (0.057)	0.133* (0.074)	0.286*** (0.072)	0.286*** (0.073)	0.243*** (0.069)	0.178* (0.093)
Industry Capex/TA (t-1)		2.956 (1.958)	2.444 (1.964)	-0.140 (2.520)		2.225 (2.048)	1.670 (2.050)	-0.358 (2.832)
Industry Market-to-Book (t-1)			0.158*** (0.061)	0.288** (0.135)			0.243*** (0.079)	0.463*** (0.171)
Scaled IPO deals (t-1)				0.280 (0.226)				0.275 (0.224)
Observations	4,862	4,843	4,803	2,165	4,781	4,763	4,726	2,143
R-squared	0.125	0.128	0.121	0.173	0.135	0.137	0.136	0.188
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Country	Year	Name of the law	Source	Details
Austria	1998	Takeover Act	Lel and Miller (2015)	Introduces for the first time formal rules for acquiring a majority interest in a company. Also intended to make Austria takeover legislation more transparent and consistent with that of other major European Countries. Explicit rules regarding purchase offers involving acquisitions of a controlling participation in a company. For further details, see, for example, Poch (1998).
Belgium	1989	Royal Decree of 11/8/1989 and the law of March 3/2/1989	Lel and Miller (2015), Nenova (2006)	Specific rules about takeover bids, mandatory offers, and disclosure of shareholder information. Formal provisions for governing mergers and acquisitions.
Germany	2002	Takeover Act	Lel and Miller (2015), Strelow and Wildberger (2002), Baum (2006)	Formal provisions for governing acquisitions of publicly traded companies. Under the Act, a bidder who has obtained control over a target must make an offer for all of the target outstanding shares, including any preference shares ("mandatory offer"). As per Strelow and Wildberger (2002), prior to the passage of the takeover act, takeovers of public companies had not often been considered worth pursuing.
Finland	1989	Securities Markets Act of 1989	Lel and Miller (2015)	Relates to the issuance of securities to the public, the transfer and clearing of securities issued to the public as well as to the arrangement of trading in securities. Sections 6 and 8 regulate takeover bids, including publication and communication of the bid, time allowed for acceptance of the bid, and treatment of competing bids. Section 10 regulates mandatory bids.
India	1997	Substantial Acquisition of Shares and Takeovers	Government of India, Ministry of Finance: http://dipam.gov.in/, Lel and Miller (2015)	Regulates disclosures of shareholding and control in a listed company as well as acquisition of shares or voting rights, acquisition of control over a listed company and bail out takeovers.
Indonesia	1998	M&A regulations (Gorvernment regulation No 27/1998), Presidential Decree No. 96 and No. 118	Lel and Miller (2015)	Is intended to guard the interests of the target company, its shareholders, and employees. Introduces formal requirements for transactions involving acquisition of controlling interest in the target company.
Italy	1992	Public Tender Offer, Law 149/1992	Nenova(2006), Lel and Miller (2015), Rossi (2012)	Regulates public tender offers and the transfer of corporate control by giving powers to the Commissione Nazionale per le Societa e la Borsa.

Table A11: Details on country takeover laws – continued

Country	Year	Name of the law	Source	Details
Malaysia	1998	Code on Takeovers and Mergers	Nenova(2006), Lel and Miller (2015)	Regulates mandatory offers, voluntary offers, advisers, acquisition of additional voting shares, etc. For further details see https://www.sc.com.my/the-malaysian-code-on-take-overs-and-mergers-1998-the-code/.
New Zealand	2001	Takeover Code	Lel and Miller (2015)	Ensures that all shareholders have the opportunity to participate in changes of control and that all parties to the transaction have a level playing field. The rules of the Takeovers Code are intended to ensure that shareholders will have all of the information they need and plenty of time to make their decision about the control-change transaction. See also http://www.takeovers.govt.nz/assets/Assets-2/Takeovers-Directors-booklet-linked2a.pdf.
Spain	1991	Public Takeover Offerings (Royal Decree 1197/1991)	Lel and Miller (2015)	Regulates disclosure of significant shareholdings in listed companies and acquisitions of shares owned by them.
Sweden	1991	Industry and Commerce Stock Exchange Committee Takeover Standard, Financial Instruments Trading Act	Nenova(2006), Lel and Miller (2015)	Regulates disclosure of changes in shareholdings. The disclosure obligation is triggered if a holding reaches, exceeds or falls below certain thresholds of the votes or the number of shares in a company. A company's acquisition and transfer of its own shares shall also be reported if the transaction implies that the holding reaches, exceeds or falls below any of the thresholds.
Switzerland	2004	The Merger Act	Lel and Miller (2015)	Regulates the civil law aspects of mergers in a broad comprehensive framework, significantly facilitating acquisition deals, which used to be governed by under Swiss corporate law and had to be carried out through a series of complicated transactions, often triggering unfavorable tax consequences and formal liquidation procedures.
South Africa	1991	Code on Takeovers and Mergers	Nenova(2006), Lel and Miller (2015)	The Takeover Regulations are largely based on older versions of the UK City Code on Takeovers and Mergers. The Takeover Regulations are statutory and are enforced by the courts rather than through self-regulation.
Taiwan	2002	Business Mergers and Acquisitions Act	Lel and Miller (2015)	Provides some general amendments to the Company Act to simplify the M&A process, introduces more types of mergers including cash-out mergers and cross-border mergers, as well as provides some tax incentives to neutralize the transaction costs associated with M&A deals.

Table A12
VC REGRESSIONS AND TAKEOVER LAWS, INCLUDING ONLY VC FIRMS THAT HAVE INVESTED IN AT LEAST TWO COUNTRIES.

Table A12 reports results from industry regressions of VC intensity on the *POSTLAW* dummy, including only VC firms that have invested in at least two countries. *POSTLAW* dummy is set to one if there was a takeover law in the country before, and to zero otherwise. *Sales HHI (t-1)* is lagged Herfindahl index constructed from sales. *Industry Capex/TA (t-1)* is the lagged industry CAPEX scaled by total assets. *Industry Market-to-Book (t-1)* is lagged industry market-to-book ratio. *Median industry size (t-1)* is the lagged median industry size. *Prelaw t(-1)* dummy is set to one in the year preceding the takeover law year and to zero otherwise. *Prelaw t(-2)* dummy is set to one in the year two years prior to the takeover law year and to zero otherwise. Country, industry, and year fixed effects included. Standard errors are clustered by country-industry.

Panel A. All VC deals.

	(1)	(2)	(3)	(4)	(5)	(6)
	Scaled VC deals	Scaled VC deals	Scaled VC deals	Scaled VC deals	Scaled VC deals	Scaled VC deals
Postlaw dummy	0.349	0.333**	0.390***	0.446*	0.350**	0.410***
	(0.247)	(0.138)	(0.147)	(0.256)	(0.147)	(0.154)
Sales HHI (t-1)			0.908***			0.908***
			(0.225)			(0.225)
Industry Capex/TA (t-1)		3.309	3.506		3.311	3.508
		(3.640)	(3.615)		(3.643)	(3.617)
Industry Market-to-Book (t-1)		0.002	0.000		0.002	0.000
		(0.017)	(0.016)		(0.017)	(0.016)
Medium industry size (t-1)		0.037	0.072*		0.037	0.072*
		(0.043)	(0.041)		(0.043)	(0.041)
Prelaw t(-1) dummy				0.155	0.076	0.080
				(0.216)	(0.152)	(0.167)
Prelaw t(-2) dummy				0.354	0.028	0.043
				(0.290)	(0.124)	(0.130)
Observations	3,982	3,215	3,215	3,982	3,215	3,215
R-squared	0.251	0.291	0.298	0.251	0.291	0.298
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes

Panel B. Only unique VC deals.

	(1)	(2)	(3)	(4)	(5)	(6)
	Scaled unique VC deals	Scaled unique VC deals	Scaled unique VC deals	Scaled unique VC deals	Scaled unique VC deals	Scaled unique VC deals
Postlaw dummy	0.454	0.350*	0.407**	0.587**	0.371**	0.432**
	(0.287)	(0.184)	(0.195)	(0.295)	(0.188)	(0.198)
Sales HHI (t-1)			0.858***			0.858***
			(0.230)			(0.230)
Industry Capex/TA (t-1)		3.055	3.249		3.058	3.252
		(3.929)	(3.910)		(3.932)	(3.912)
Industry Market-to-Book (t-1)		0.007	0.005		0.007	0.005
		(0.017)	(0.016)		(0.017)	(0.016)
Medium industry size (t-1)		0.032	0.065		0.032	0.065
		(0.044)	(0.042)		(0.044)	(0.042)
Prelaw t(-1) dummy				0.217	0.087	0.095
				(0.276)	(0.198)	(0.211)
Prelaw t(-2) dummy				0.460	0.035	0.053
				(0.349)	(0.174)	(0.177)
Observations	3,906	3,152	3,152	3,906	3,152	3,152
R-squared	0.230	0.287	0.292	0.230	0.287	0.292
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes

Table A13
STATE-LEVEL REGRESSIONS ON SPECIFIC STATE ANTITAKEOVER LAWS

Table A13 reports results from state level regressions of VC intensity on different components of the state anti-takeover laws. Panel A use the Control Share acquisition laws and Panel B uses Fair Price laws. Each of these is set equal to one after the anti-takeover law is enacted. *Median CAPEX/TA (t-1)* is the lagged median firm CAPEX scaled by total assets in the state. *Median Market-to-Book (t-1)* is lagged median market-to-book ratio. *Median size (t-1)* is the lagged median firm size. Year fixed effects are included, errors are clustered by state.

Panel A. Control Share Acquisitions Laws

	(1)	(2)	(3)	(4)	(5)	(6)
	Scaled VC deals	Scaled unique VC deals	Scaled VC deals	Scaled unique VC deals	Scaled VC deals	Scaled unique VC deals
Control Share Law	-0.187*	-0.247*	-0.182*	-0.236**	-0.183*	-0.238**
	(0.106)	(0.127)	(0.098)	(0.117)	(0.099)	(0.118)
Median CAPEX/TA (t-1)			-3.503*	-5.065**	-3.471*	-5.023**
			(1.777)	(1.896)	(1.781)	(1.898)
Median Market-to-Book (t-1)			0.186	0.169	0.187	0.171
			(0.220)	(0.331)	(0.221)	(0.332)
Median Size (t-1)			0.000	0.000	0.000	0.000
			(0.000)	(0.000)	(0.000)	(0.000)
Prelaw t(-1) dummy					-0.082	-0.091
					(0.073)	(0.139)
Prelaw t(-2) dummy					-0.067	-0.118
					(0.093)	(0.259)
Observations	1,084	1,083	1,084	1,083	1,084	1,083
R-squared	0.285	0.238	0.308	0.266	0.308	0.267
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes

Panel B. Fair Price Laws

	(1)	(2)	(3)	(4)	(5)	(6)
	Scaled VC deals	Scaled unique VC deals	Scaled VC deals	Scaled unique VC deals	Scaled VC deals	Scaled unique VC deals
Fair Price Law	-0.226*	-0.262*	-0.251**	-0.285**	-0.253**	-0.288**
	(0.117)	(0.147)	(0.110)	(0.133)	(0.111)	(0.134)
Median CAPEX/TA (t-1)			-4.737**	-6.500***	-4.745**	-6.510***
			(1.830)	(2.153)	(1.823)	(2.136)
Median Market-to-Book (t-1)			0.196	0.179	0.196	0.180
			(0.213)	(0.323)	(0.213)	(0.324)
Median Size (t-1)			0.000	0.000	0.000	0.000
			(0.000)	(0.000)	(0.000)	(0.000)
Prelaw t(-1) dummy					-0.117*	-0.197*
					(0.059)	(0.105)
Prelaw t(-2) dummy					-0.046	-0.124
					(0.061)	(0.116)
Observations	1,084	1,083	1,084	1,083	1,084	1,083
R-squared	0.296	0.240	0.328	0.276	0.329	0.277
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes