

Article

Pathways to Success: The Interplay of Industry and Venture Capital Clusters in Entrepreneurial Company Exits

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Abstract: This study investigates the dynamics within entrepreneurial ecosystems, focusing on the influence of venture capital (VC) financing clusters and industry clusters on startup success. VC financing clusters, geographic hubs with intense VC funding activities, and industry clusters, regions with concentrated sector-specific firms, are integral components. Expanding existing research that links proximity to these clusters with successful exits through mergers and acquisitions (M&A), our study includes initial public offerings (IPOs) as a vital exit strategy. Results show that affiliations with venture capitalists in prominent VC financing clusters enhance M&A and IPO success for startups. Intriguingly, startups in industry strongholds exhibit a greater likelihood of M&A success, but this effect is not seen for IPO exits. Additionally, the absence of startup co-location with venture capitalists in VC financing hubs does not impact IPO exits but hinders M&A success. These nuanced insights highlight the complex relationships within entrepreneurial ecosystems and underscore the need for tailored perspectives considering diverse exit pathways.

Keywords: startup financing; financial institutions; venture capital; financing clusters; industry clusters; startup exits



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1. Introduction

The success of prominent entrepreneurial hubs like Silicon Valley and Boston has captivated scholars and policymakers alike, propelling research examining the interconnected dynamics between startup activity and regional economic development (Glaeser et al. 1992; Feldman 2001; Kerr and Nanda 2018; Bradley et al. 2021). Dissecting these thriving ecosystems reveals a cornerstone—the geographic clustering of firms based on shared attributes like industry focus or access to financial resources (Delgado et al. 2010; Rosenbusch et al. 2013; Janeway et al. 2021; Clayton et al. 2023). However, a glaring gap persists in understanding how components within these clusters directly influence the success prospects of individual startups (Lerner 2009, 2020).

This study delves into this gap by examining the impacts of two specific cluster types on startup success through the lens of successful exits, defined as mergers and acquisitions (M&A) or initial public offerings (IPOs). We move beyond proximity-centric analyses to analyze the role of:

- Venture capital (VC) financing clusters: geographic hubs with dense concentrations of venture capital firms, conferring access to funding and expansive professional networks.
- Industry clusters: agglomerations of interconnected firms within a specific sector, providing specialized skills, suppliers, and collaborators.

This departs from simplistic assumptions about the sole influence of capital availability (Gorman and Sahlman 1989). Moreover, venture capitalists, beyond just capital provision, act as value-added partners, facilitating access to crucial networks of HR consultants, lawyers, investment bankers, and other professionals that empower startups (Hochberg

et al. 2010; Hellmann and Thiele 2019). This aligns with research emphasizing investor relationships and knowledge exchange in new venture success.

This study examines the impact of two key cluster types on startup success: venture capital (VC) financing clusters with concentrated availability of venture capital and industry clusters representing geographic agglomerations of firms in a specific sector. The presence of experienced venture capitalists (VCs) in financing clusters is identified as a significant factor influencing successful outcomes for a startup in exits through both IPOs and M&A. Interestingly, merely being located in top-tier venture capital clusters does not significantly predict success.

Examining industry clusters provides additional insights into how different types of clusters influence different kinds of exit outcomes. Startups positioned within sector-specific agglomerations or industry clusters demonstrate a greater likelihood of successful M&A exits. This effect amplifies further when startups also have relationships with venture capitalists embedded within VC financing hubs, suggesting an impactful blend of industry expertise and investor access (Popov and Roosenboom 2012; Ahluwalia and Kassicieh 2021). This resonates with research on diverse strategic partnerships aiding new ventures (Stuart and Sorenson 2007).

This paper contributes to several research streams examining the geography of entrepreneurship. Studies have scrutinized the prevalence of high-technology entrepreneurship in specific regions, linking startup activity to knowledge spillovers from universities (Kerr and Nanda 2022; Meoli and Vismara 2016), labor mobility (Fallick et al. 2006), and entrepreneurial culture (Saxenian 1996; Nikolova-Alexieva and Angelova 2020). Florida and Kenney (1988) highlighted the significance of venture capital availability, while others emphasize the role of diverse financing options including angel investors and bank lending (Colombo and Grilli 2018; Kerr and Nanda 2022).

Our study builds on this work by shifting the focus away from the physical proximity between startups and venture capitalists. Instead, we scrutinize the co-location of startups and venture capitalists within VC financing and industry clusters. Focusing on successful exits as our metric of startup success provides a tangible way to assess performance, building on literature emphasizing IPOs and M&A as key milestones (Nahata 2008; Lerner and Tåg 2020). Our investigation explores how the presence of a startup in these clusters affects its future success, considering the various tangible and intangible benefits conferred by financing and industrial clusters, such as networks of suppliers, complementary industries, and access to industry expertise (Chen and Wong 2022).

Our study aligns with Ahluwalia and Kassicieh's (2021) findings, demonstrating that the presence of a venture capital firm in a VC financing cluster correlates with an increased probability of a successful merger and acquisition (M&A) exit, while the presence of startups in an industry cluster positively influences M&A outcomes. Expanding upon this research, we delve into another pivotal facet of startup exits—the initial public offering (IPO). Our results indicate that the presence of VC in a financing cluster enhances the likelihood of IPO exits; however, a parallel effect is not observed for startups located in industry clusters. Furthermore, our findings reveal that the co-location of VC and startups significantly impacts M&A exits but does not exert a similar influence on IPO exits. This unique contribution contributes to a more comprehensive understanding of the intricate dynamics shaping startup success.

By unraveling the intricate mechanisms that link various cluster types with key players like venture capitalists, this study offers nuanced empirical insights into the factors influencing startup success. These insights not only contribute to the existing literature but also have practical applications, informing policy interventions and guiding startups in making strategic choices to strengthen entrepreneurial ecosystems.

Our research provides several noteworthy contributions. Firstly, we underscore the significance of physical location between different cluster types, emphasizing that it matters beyond the traditional focus on proximity between a VC and a startup. Secondly, we document distinct effects of industry clusters versus VC financing clusters on successful

startup outcomes. Thirdly, we demonstrate how the co-location of a VC or a startup within a specific cluster has varied effects on different types of startup exits.

The implications of our study extend to policymakers, entrepreneurs, and investors aiming to foster the development of the next “Silicon Valley. By highlighting the most crucial components to prioritize, our findings offer practical insights for those seeking to cultivate thriving entrepreneurial ecosystems. In summary, this nuanced perspective provides valuable insights into the inner workings of entrepreneurial hotspots and contributes to our understanding of startup success.

This paper begins with a literature review in Section 2, followed by the formulation of hypotheses in Section 3. Section 4 offers a comprehensive description of the employed data and methodology, leading to the presentation of results in Section 5 and a discussion of these results in Section 6. Section 7 explores limitations and suggests future research avenues, while Section 8 serves as the conclusion.

2. Literature Review

A sizable stream of literature has examined the geography of entrepreneurship, finding that certain regions exhibit greater prowess in fostering startups (Feldman 2001; Kerr and Nanda 2018). Silicon Valley stands out as the exemplar of an entrepreneurial ecosystem, attributed in part to the unparalleled availability of risk capital (Engel 2015). However, questions persist regarding whether injecting venture capital alone in a region replicating other features of Silicon Valley would stimulate comparable success (Lerner 2009).

Financing from venture capital firms represents the dominant source of early-stage capital for startups since the 1980s, supplementing traditional sources like banks or public markets, which are averse to high risk–reward profiles. These firms provide substantial funding as well as value-added services like mentorship and access to networks, often holding board seats (Gorman and Sahlman 1989; Sapienza 1992; Chen and Wong 2022). Venture capitalists make investments via syndicates to combine expertise and diversify risks (Lerner 1994b; Lerner and Tåg 2020).

Prior studies have examined the spatial proximity between venture capitalists and their portfolio companies. Local bias has been attributed to personal networks and hands-on involvement (Sorenson and Stuart 2001). However, more experienced investors demonstrate less bias, enabled by broader networks (Cumming and Dai 2011; Vissak et al. 2020). Specialization in certain technologies can increase local bias (Chen et al. 2010). Others highlight the imbalance between ideas and money, emphasizing the need for co-location (Häussler and Zademach 2007). Overall, existing literature focuses extensively on the physical distance between startups and their financial backers.

This study offers a departure by analyzing the presence of startups and affiliated venture capitalists within two key clusters—VC financing and industry. Industry clusters represent geographical agglomerations of interconnected companies, suppliers, and institutions in a particular sector (Porter 1998). Considerable disagreement exists on how industry clusters specifically influence startups. While some highlight the benefits of knowledge spillovers (Marshall 1920), others argue that local monopolies spur innovation (Arrow 1962). Porter (1990) instead emphasizes the role of competition within clusters. This theoretical ambiguity provides impetus for an empirical examination.

Entrepreneurship research has relied on various success measures for venture-backed startups, typically emphasizing exits delivering substantial returns for investors (Cumming et al. 2014). IPOs and acquisitions allow venture capitalists to liquidate their investments at a profit (Nahata et al. 2014). Therefore, this study utilizes IPOs and M&A as proxies for success (Hochberg et al. 2007). Prior literature utilizes varied measures to gauge the performance of venture-backed startups, such as employment growth, revenue, valuations, and the exit timelines of investors (Giot and Schwienbacher 2007; Puri and Zarutskie 2012; Lohwasser 2020). This study focuses specifically on exit-related success metrics viewed as important milestones by venture capitalists and entrepreneurs, defined as any liquidity events, including acquisitions, mergers, and IPOs. Specifically, we focus on successful exits

through IPOs, which provides a more restrictive definition focused solely on IPO events, representing more significant valuation milestones and greater profitability and prestige (Jeng and Wells 2000).

The next section develops hypotheses linking industry and VC financing clusters to these outcomes.

3. Hypotheses

This study examines the influence of key components of entrepreneurial ecosystems on the success prospects of startups. Drawing upon academic research on entrepreneurial finance, economic geography, and cluster theory, the hypotheses focus on two pivotal types of clusters:

VC financing clusters: VC financing clusters represent geographical agglomerations containing a high density of startup funding activity (Florida and Kenney 1988; Kerr and Nanda 2022). We define VC financing clusters as the top metropolitan statistical areas (MSAs) ranked by total venture capital investments into entrepreneurial companies.

Existing literature suggests venture capitalists often exhibit a local bias, preferring to invest in startups located in their proximity (Sorenson and Stuart 2001; Chen et al. 2010). However, more experienced venture capitalists demonstrate less bias due to their expanded networks spanning multiple regions (Cumming and Dai 2011). Venture capitalists located within deep financing clusters can leverage expertise and relationships built over time to contribute more effectively to their portfolio companies' success. Hochberg et al. (2007) found evidence of venture capitalists with strong local networks generating better investment performance. Therefore, we propose the first hypothesis as follows:

Hypothesis 1. *Startups will have a higher probability of successful exit if their affiliated venture capital firm is located within a leading VC financing cluster.*

Established financing clusters, such as Silicon Valley and Boston, are characterized by robust support infrastructures that encompass specialized talent in key areas such as technology, law, HR, and accounting, all tailored to meet the unique needs of startups. Moreover, these clusters boast extensive networks involving corporate partners, vendors, and customers (Glaeser et al. 2010; Delgado et al. 2016). Situating startups within these influential clusters offers them a strategic advantage, allowing them to tap into collective intelligence and leverage lessons learned in pivotal processes such as fundraising, product development, talent recruitment, and growth strategy. This not only aids in navigating challenges but also assists in maintaining a calibrated pace for sustainable development (Rothenberg 2011).

The dense networking events, conferences, and opportunities inherent in financing epicenters further contribute to the success of startups by exposing them to potential partners, advisors, and collaborators that may be challenging to access in other locales (Engel and Del-Palacio 2011). Additionally, the concentrated startup activity within these clusters creates demonstration effects and instills competitive peer pressure, establishing benchmarks for setting milestones and performance standards (Fallick et al. 2006).

Therefore, we expect startups located in premier VC financing hubs to reap positive externalities by gaining access to the intricate networks, specialized skills, and industry knowledge accumulated in these regions. This leads to the second hypothesis:

Hypothesis 2. *Startups located in leading VC financing clusters will exhibit a higher likelihood of successful exits.*

Industry clusters: In addition to financing clusters, we also examine the role of industry clusters, defined as geographical concentrations of firms operating in a particular sector (Porter 1998). For each one-digit SIC code industry, we identify the top MSAs by number of established firms as proxies for industry clusters.

The presence of startups within industry strongholds indicates access to sector-specific human capital, suppliers, partners, and support infrastructure beneficial for their operations and growth (Folta et al. 2006). However, theory presents conflicting perspectives on how industry leadership versus competition shapes startup success, leading to an ambiguous overall prediction.

The Marshall–Arrow–Romer framework highlighted knowledge spillovers and monopoly power accruing to firms in clusters as drivers of growth (Marshall 1920; Arrow 1962; Romer 1986). Others, like Chinitz (1961), emphasize that local monopolies actually dampen entrepreneurship relative to clusters with high new firm entry rates and competition. Porter (1990) also argues that the intensity of local rivalry, rather than monopoly power, promotes innovation and the upgrading of competitiveness in clusters.

Empirical evidence on this remains equivocal. Glaeser et al. (1992) found that diversity and competition elevated employment growth in industries across U.S. cities, rather than Marshallian externalities. However, Henderson (1986) shows that knowledge spillovers significantly benefit high-tech firms in concentrated clusters. Delgado et al. (2010) find that clusters foster entrepreneurship after controlling for industrial composition. We posit the following hypothesis to test the relationship between startups' industry cluster presence and their success prospects:

Hypothesis 3. *Startups located in major industrial clusters will exhibit a higher likelihood of successful exits.*

Furthermore, we expect interdependencies between the effects of financing and industry clusters. Venture capitalists bring specialized expertise to their focus industries, like healthcare, information technology, etc. (Norton and Tenenbaum 1993). They leverage networks within industry hubs to help their portfolio companies with recruiting, finding suppliers or customers, and securing partnerships (Gorman and Sahlman 1989).

Role of co-location of VCs and startups:

The co-location of a startup and a venture capital (VC) firm offers substantial benefits, as evident in various finance studies. Proximity enhances communication, trust, and collaboration between startups and VC investors, facilitating more efficient information exchange and due-diligence processes. The research highlights that geographical closeness enables VC firms to actively monitor and support portfolio companies, leading to improved startup performance and increased success rates (Gompers and Lerner 1999). Additionally, close physical proximity allows for more frequent and substantive interactions, contributing to a deeper understanding of the startup's operations and strategic needs by the VC firm. This proximity proves particularly advantageous during critical fundraising or exit phases, where immediate access to decision-makers can accelerate successful outcomes, as shown in studies like Hellmann and Puri (2002).

On the other hand, high-potential startups exhibit greater resilience to location effects. Venture capitalists often prioritize startup quality over geography, willingly investing in compelling companies across multiple regions (Chen et al. 2010). Since a VC may choose to invest in a physically distant startup because they believe it will have a successful outcome, it is not clear if the absence of proximity between VC and a startup has a negative influence on exit success. The effect of the co-location of the VC and the startup is an empirical question that we analyze by stating the fourth hypothesis as follows:

Hypothesis 4. *The effects of geographical proximity to industry and financing clusters will be positively amplified if the startup and the VC are co-located.*

In summary, the hypotheses posited in this paper aim to comprehensively examine the impact of co-locating VC financing and industry clusters on the success of venture-funded startups. The next section details the data and methodology employed to empirically test these hypotheses.

4. Data

The sample comprised venture capital deals spanning 1980 to 2014, sourced from Thomson Reuters’ SDC Platinum database. The decision to start the coverage in 1980 was driven by the sparsity of VC data for earlier years. Choosing 2014 as the ending year enabled us to track the exit outcomes for startups for up to 10 years after 2014. Furthermore, the 34-year study period takes into account diverse macroeconomic conditions, enhancing the generalizability of our findings.

Following existing literature, venture-backed startups were identified by filtering out buyouts, secondary purchases, mezzanine financing, and other non-venture transactions (Puri and Zarutskie 2012). The final sample included 15,111 investments by 629 venture capital firms in 5905 startups across 362 metropolitan statistical areas (MSAs) in the United States.

Information on the geographical coordinates of startups and affiliated venture firms were extracted to construct the key predictor variables—VC financing cluster and industry cluster:

VC financing cluster: dummy indicating whether the startup or VC is located within an MSA ranking among the top 10 in terms of aggregate startup funding for the period 1980–1990. This mitigates potential endogeneity concerns, mimicking prior approaches (Hochberg et al. 2007). See Table 1.

Table 1. Top Ten Venture Capital MSA Codes Ranked by Investment Dollars.

Rank	MSA	Region
1	7360, 7400	San Francisco, CA San Jose, CA
2	1120	Boston, MA/New Hampshire,
3	5600	New York, NY
4	4480	Los Angeles/Long Beach, CA
5	7600	Seattle/Bellevue/Everett, WA
6	5775	Oakland, CA
7	1600	Chicago, IL
8	8840	Washington, DC; Maryland;Virginia;West Virginia
9	7320	San Diego, CA
10	640	Austin/San Marcos, TX

Notes: The above table shows the top 10 MSA codes that received the maximum number of investment dollars.

Industry cluster: dummy indicating if the startup is located in one of the top 10 MSAs by the number of firms in its industry, identified using Compustat data on public companies from 1981–1990. The use of historical data limits reverse causality issues.

Our primary variable of interest was ExitSuccess. ExitSuccess is a dummy variable that takes a value of 1 if the company exited or is in the process of exiting through an IPO, a merger, or an acquisition. Table 2 shows the exit outcomes for the venture-capital-backed companies in the United States. A total of 7140 exits were recorded for US venture-backed companies over the time period between 1991 and 2014. We dropped 62 observations where the status was “LBO”, since leveraged buyouts are predominantly for established companies that are not considered startups (Gompers and Lerner 2001). We also dropped 7905 observations where the status was “active”, since it was not possible to categorize the future exit outcome. We also dropped four observations that were categorized as “Other”, since we could not ascertain the exits of these companies. The variable ExitSuccess takes a value of one if the portfolio company is considered a “success”. We defined success in two different ways:

1. Exit by merger and acquisition (M&A) only: this indicates that the startup in which a venture capital firm invested was acquired by another company, merged with another company, or is in the process of doing so.
2. Exit by initial public offering (IPO) only: this indicates that the startup in which a venture capital firm invested has been taken public or is in the process of going public.

Table 2. Exit Outcomes for VC-Backed Companies (1991–2014).

Exit Type	Number of Companies	Percent	ExitSuccess by Acquisition, Merger or IPO	ExitSuccess by IPO Only
Acquisition	4456	62.41%	Yes	No
Pending Acquisition	45	0.63%	Yes	No
Merger	128	1.79%	Yes	No
Went Public	664	9.30%	Yes	Yes
In Registration	35	0.49%	Yes	Yes
Bankruptcy	82	1.15%	No	No
Defunct	1730	24.23%	No	No
Number of Companies With ExitSuccess = 1			5328	699
Total	7140	100%		

Notes: The above table shows the exit outcomes for the venture-capital-backed companies in the United States. A total of 7140 exits were recorded for US venture-backed companies over the 24-year time period between 1991 and 2014. Success is a dummy variable that takes 1 if the company had or is in the process of having an exit through an IPO, merger, or acquisition. Excludes companies with the status “Active” (7905), “LBO” (62), or “Other” (4).

Table 2 shows the distribution of startup firms by exit outcome. In our sample, spanning from 1991 to 2014, there were 4456 startups that were acquired, 664 that went through an IPO, 128 that merged with other companies, and 45 and 35 in the process of being acquired or going through an IPO, respectively.

5. Analysis

The baseline hypothesis was tested by estimating the following logistic regression:

$$\text{ExitSuccess}_{(i)} = \alpha + \beta_1 \text{Startup in VC Cluster}_i + \beta_2 \text{VC in VC Cluster}_i + \beta_3 \text{Startup in Industry Cluster}_i + \beta_n \text{Control Variables} + e_i \tag{1}$$

where:

- (i) is one observation per startup;
- ExitSuccess is defined as exit through an IPO (I) or mergers and acquisitions (M&A).

The subscripts represent individual startup companies. The key coefficients of interest are β_1 , β_2 , and β_3 , which measure the impacts of startups’ and venture capitalists’ proximity to financing and industry clusters. The control variables included startup quality indicators, venture capitalist reputation, and industry fixed effects. Standard errors were clustered at the MSA level to account for correlated unobserved factors.

We used a regression model based on the above equations to test if a startup’s success was related to the startup or VC firm being headquartered in a financial or industry cluster. Ideally, we would have liked to measure the performance of each startup company directly. However, the companies are private, and their return data are not available. For some companies, valuations are provided in the SDC Platinum database, but these are extremely sparse. Instead, we measured the performance of companies indirectly by looking at the types of exit they had. We followed the existing literature and used the type of exit of a startup as a measure of its success (Hochberg et al. 2007). If a startup goes through an IPO

or is acquired by some other firm or merged with another company, we categorize it as a successful outcome, and the variable *ExitSuccess* is set equal to 1. If the startup goes defunct or bankrupt, we classify it as a failure, and the variable *ExitSuccess* is set equal to 0.

We employed three binary independent variables to capture the effects of the presence of the VC or the startup being in a VC cluster and/or industry cluster:

- **VC Cluster Startup:** This variable takes a value of 1 if a startup is headquartered in one of the top-ranked VC cluster metropolitan statistical areas (MSAs). This captures the potential benefits of residing within a hub of VC activity, where proximity to investors, networks, and resources might translate to an advantage.
- **Industry Cluster Startup:** Similar to the above, this variable indicates whether the startup is nestled within a top-10 industry cluster MSA. This investigates the potential influence of being embedded within a sector-specific agglomeration, where close proximity to peers, specialized expertise, and knowledge exchange could fuel success.
- **VC Cluster VC:** This variable takes on a value of 1 if at least one VC firm invested in the startup is headquartered in a top-10 VC cluster MSA, even if the startup itself is not located there. This examines the impact of accessing established VCs from within concentrated VC hubs, exploring whether their expertise and connections translate into benefits for startups regardless of their own physical location.

Our focus on these specific variables extends beyond mere geographical proximity. By capturing the presence of both startups and VCs within these thriving ecosystems, we aimed to uncover the interplay between cluster types and their effects on startup outcomes (Kerr and Nanda 2022). Moreover, acknowledging the influence of other vital factors such as VC experience and reputation is crucial for drawing accurate conclusions. We therefore controlled for VC reputation using the presence of follow-on funds (Megginson and Weiss 1991; Lerner 1994a; Gompers 1996) as a proxy, reflecting the success a VC has achieved in picking winning startups and leading them to successful exits, ultimately influencing their ability to raise money for subsequent funds.

To control for startup quality, we included the total amount invested and number of financing rounds received by each startup. We also incorporated industry fixed effects based on one-digit SIC codes.

Table 3 presents the logistic regression results. The dependent variable, *ExitSuccess*, is an indicator variable that takes the value 1 for startups exiting via an initial public offering (IPO) or merger and acquisition (M&A). Specification 1 includes only the key cluster predictors, while Specification 2 adds control variables. Specifications 3 and 4 run a similar regression to Specification 2, but with the sample restricted to the VC and the startup being in the same MSA code in Specification 3 and otherwise in Specification 4.

The results show that the venture capital firm's location in a leading financing cluster positively and significantly predicts startup exit success. In Specification 2, the coefficient for the VC being in a VC cluster is 0.2551, suggesting that the log odds of a successful IPO or M&A outcome increase by 0.25 if the affiliated VC is located in a premier financing hub.

Additionally, startups situated in major industry clusters exhibit a higher likelihood of exit success. However, somewhat surprisingly, the startup's own presence in a top financing cluster does not significantly influence its exit prospects.

To isolate the effect of the geographical proximity of a VC to the startup it is funding, we divided our sample into two parts, one where the startup and the VC are co-located in the same MSA code and one where they are not. Specification 3 was run for the subsample of startups that were co-located with at least one VC funding the startup, and Specification 4 was run for the rest of the sample. Specification 3 shows that when startups and VCs are co-located in the same MSA, the Startup in Industry cluster variable is significant; however, in Specification 4, where VCs and startups are not co-located in the same MSAs, the VC Cluster VC variable is significant. In Specifications 3 and 4, the Startup in VC Cluster variable is still insignificant. The VC experience and quality of startup variables are significant across the samples and subsamples, as has been extensively documented in the existing literature.

Table 3. Regression Results for Industry, and VC Cluster Variables for All Successful Exits.

	ExitSuccess—IPO or Mergers and Acquisitions			
	(1)	(2)	VC and Company in the Same MSA (3)	VC and Company Not in the Same MSA (4)
VC in VC Cluster	0.5389 *** (0.0754)	0.2551 *** (0.0832)	0.2398 (0.1728)	0.2233 ** (0.1002)
Startup in VC Cluster	−0.1399 ** (0.0635)	−0.06371 (0.0663)	−0.02078 (0.1288)	−0.1098 (0.0837)
Startup in Industry Cluster	0.2312 *** (0.0588)	0.1293 ** (0.0635)	0.2039 ** (0.0972)	0.07552 (0.0845)
Follow-On Fund		0.07615 (0.0686)	−0.03743 (0.1047)	0.1468 (0.0912)
Number of Rounds		0.1562 *** (0.0188)	0.1876 *** (0.0273)	0.1264 *** (0.0261)
Total Amount Invested		0.003891 *** (0.0015)	0.003583 ** (0.0018)	0.004001 * (0.0023)
Industry Fixed Effects	No	Yes	Yes	Yes
Constant	0.5834 *** (0.0718)	0.5465 *** (0.1621)	0.4953 ** (0.2386)	0.6441 *** (0.2292)
Observations	7134	6981	3473	3508
Pseudo R-squared	0.83%	4.53%	5.10%	4.01%

Notes: This table displays the results of a logit regression investigating the impacts of cluster variables on startup exits. The dependent variable is an indicator variable with a value of 1 if the startup exit is categorized as an IPO or M&A. VC in VC Cluster is coded as 1 if the MSA code of the VC firm matches any of the top 10 VC cluster MSA codes. Startup in VC Cluster is assigned a value of 1 when its metropolitan statistical area (MSA) code aligns with any of the top 10 VC cluster MSA codes. Startup in Industry Cluster is coded as 1 if its MSA code matches any of the top 10 industry cluster MSA codes. Follow-On Fund takes a value of 1 if the VC fund investing in the startup is a repeat fund. The variable Number of Rounds indicates the total funding rounds received by the startup, Total Amount Invested represents the cumulative dollars invested by the VC fund, and Industry indicates the industry of the startup based on the SDC Platinum database. The sample includes observations from 1990 to 2014, covering all instances where the VC funding indicator is set to 1 in SDC Platinum. Standard errors in parentheses, * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Specifications 3 and 4 were run, in which ExitSuccess was defined as startups that have already undergone an IPO or are in the process of going through an IPO. We obtained similar results for the alternative specification of startup success as IPOs only.

In Tables 4 and 5, we further analyze the effects of cluster variables on each type of exit success. In Table 4, we define exit success as exits through mergers and acquisitions only, and we ran logistic regressions based on the following specification:

$$\text{ExitSuccess}_{(i)} = \alpha + \beta_1 \text{Startup in VC Cluster}_i + \beta_2 \text{VC in VC Cluster}_i + \beta_3 \text{Startup in Industry Cluster}_i + \beta_n \text{Control Variables} + e_i \tag{2}$$

where:

- (i) is one observation per startup.
- ExitSuccess is defined as exit through mergers and acquisitions (M&A).

Table 4 presents the logistic regression results where the dependent variable, ExitSuccess, is an indicator variable that takes the value 1 for startups exiting via merger and acquisition (M&A). Specification 1 includes only the key cluster predictors, while Specification 2 adds control variables. Specifications 3 and 4 run a similar regression to Specification 2 but with the sample restricted to the VC and the startup being in the same MSA code in Specification 3 and otherwise in Specification 4.

Table 4. Regression Results for Company, Industry, and VC Cluster Variables for M&A Exits.

	ExitSuccess—Acquisition or Merger			
	(1)	(2)	VC and Company in the Same MSA (3)	VC and Company Not in the Same MSA (4)
VC in VC Cluster	0.2437 *** (0.0720)	0.2303 *** (0.0784)	0.3079 * (0.1621)	0.1564 * (0.0930)
Startup in VC Cluster	−0.08196 (0.0575)	−0.06506 (0.0591)	−0.1229 (0.1124)	−0.07693 (0.0751)
Startup in Industry Cluster	0.1567 *** (0.0536)	0.1749 *** (0.0548)	0.2448 *** (0.0812)	0.1161 (0.0747)
Follow-On Fund		0.1359 ** (0.0645)	0.01890 (0.0995)	0.2123 ** (0.0850)
Number of Rounds		0.09173 *** (0.0134)	0.1158 *** (0.0191)	0.06424 *** (0.0185)
Total Amount Invested		−0.005297 *** (0.0008)	−0.007157 *** (0.0010)	−0.003331 *** (0.0011)
Industry Fixed Effects		No	No	No
Constant	0.3657 *** (0.0692)	0.08956 (0.0788)	0.1513 (0.1359)	0.1049 (0.1012)
Observations	7134	6981	3473	3508
Pseudo R-squared	0.22%	1.31%	1.90%	0.87%

Notes: This table displays the results of a logit regression investigating the impacts of cluster variables on startup exits. The dependent variable is an indicator variable with a value of 1 if the startup exit is categorized as M&A. VC in VC Cluster is coded as 1 if the MSA code of the VC firm matches any of the top 10 VC cluster MSA codes. Startup in VC Cluster is assigned a value of 1 when its metropolitan statistical area (MSA) code aligns with any of the top 10 VC cluster MSA codes. Startup in Industry Cluster is coded as 1 if its MSA code matches any of the top 10 industry cluster MSA codes. Follow-On Fund takes a value of 1 if the VC fund investing in the startup is a repeat fund. The variable Number of Rounds indicates the total funding rounds received by the startup, Total Amount Invested represents the cumulative dollars invested by the VC fund, and Industry indicates the industry of the startup based on the SDC Platinum database. The sample includes observations from 1990 to 2014, covering all instances where the VC funding indicator is set to 1 in SDC Platinum. Standard errors in parentheses, * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

The results show an increased probability of exit success through mergers and acquisitions (M&A) for startups situated within industry clusters and those financed by venture capitalists (VCs) located in VC clusters. For instance, in Specification 2, the coefficient of Startup in Industry Cluster is 0.1749 and statistically significant at the 1% level. This implies that the log odds of a successful M&A exit increase by 0.175 if the startup operates within a top industry cluster.

Intriguingly, when considering the geographical proximity between startups and VCs, Specification 3 demonstrates significance for both the Startup in Industry Cluster and VC in VC Cluster variables. However, in Specification 4, where the VC lacks geographical proximity to the startup, these cluster variables lose significance.

In Table 5, we have rerun our analysis by setting the variable ExitSuccess = 1 only for startups that went through an IPO or were in the IPO registration process. We ran logistic regressions based on the following equation:

$$\begin{aligned}
 & \text{ExitSuccess}_{(i)} \\
 & = \alpha + \beta_1 \text{Startup in VC Cluster}_i + \beta_2 \text{VC in VC Cluster}_i \\
 & + \beta_3 \text{Startup in Industry Cluster}_i + \beta_n \text{Control Variables} + e_i
 \end{aligned}
 \tag{3}$$

where:

- (i) is one observation per startup;
- ExitSuccess is defined as exit through IPO.

Table 5. Regression Results for Industry, and VC Cluster Variables for IPO Exits.

	ExitSuccess—IPO			
	(1)	(2)	VC and Company in the Same MSA (3)	VC and Company Not in the Same MSA (4)
VC in VC Cluster	0.7550 *** (0.1490)	0.3270 ** (0.1648)	0.3314 (0.3955)	0.3790 ** (0.1854)
Startup in VC Cluster	−0.09205 (0.0919)	0.05221 (0.1008)	0.3467 * (0.1973)	−0.07741 (0.1291)
Startup in Industry Cluster	0.09286 (0.0870)	0.003464 (0.0971)	−0.07205 (0.1467)	0.04886 (0.1302)
Follow-On Fund		0.1313 (0.1249)	0.4198 * (0.2186)	−0.04500 (0.1574)
Number of Rounds		0.04574 *** (0.0171)	0.03211 (0.0227)	0.06513 *** (0.0251)
Total Amount Invested		0.01032 *** (0.0014)	0.01237 *** (0.0014)	0.007561 *** (0.0024)
Industry Fixed Effects	No	Yes	Yes	Yes
Constant	−2.8859 *** (0.1461)	−2.2080 *** (0.2000)	−2.6732 *** (0.3879)	−2.0236 *** (0.2590)
Observations	7134	6981	3473	3508
Pseudo R-squared	0.71%	10.21%	13.13%	8.63%

Notes: This table displays the results of a logit regression investigating the impacts of cluster variables on startup exits. The dependent variable is an indicator variable with a value of 1 if the startup exit is categorized as an IPO. VC in VC Cluster is coded as 1 if the MSA code of the VC firm matches any of the top 10 VC cluster MSA codes. Startup in VC Cluster is assigned a value of 1 when its metropolitan statistical area (MSA) code aligns with any of the top 10 VC cluster MSA codes. Startup in Industry Cluster is coded as 1 if its MSA code matches any of the top 10 industry cluster MSA codes. Follow-On Fund takes a value of 1 if the VC fund investing in the startup is a repeat fund. The variable Number of Rounds indicates the total funding rounds received by the startup, Total Amount Invested represents the cumulative dollars invested by the VC fund, and Industry indicates the industry of the startup based on the SDC Platinum database. The sample includes observations from 1990 to 2014, covering all instances where the VC funding indicator is set to 1 in SDC Platinum. Standard errors in parentheses, * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

It can be argued that some acquisitions may not be a successful exit for the startup since in many cases the founders and VC choose this outcome to limit their losses and sell the assets of the startup to the highest available bidder. As a stronger test of our hypothesis, we ran our analysis by defining an exit as a success only for startups that went through an IPO or were in the IPO registration process.

Table 5 shows the results of the logistic regression where the dependent variable, Ex-itSuccess, is an indicator variable that takes the value 1 for startups exiting via an IPO. Specification 1 includes only the key cluster predictors, while Specification 2 adds control variables. Specifications 3 and 4 run a similar regression to Specification 2 but with the sample restricted to the VC and the startup being in the same MSA code in Specification 3 and otherwise in Specification 4. Startup firms that are financed by VCs headquartered in the top VC cluster have a significantly higher probability of a successful exit outcome. Furthermore, startups that are not co-located with a VC tend to have a higher probability of exit through an IPO. This result is consistent with [Chen et al. \(2010\)](#), who also found that the most successful VC investments are the ones in startups that are not located in the vicinity of the VC. The Startup in Industry Cluster variable was not significant for any of the specifications we tested for IPO success.

6. Discussion

The results reveal insights into the mechanisms underpinning successful outcomes for venture-backed startups. Affiliation with experienced venture capitalists embedded within prominent financing hubs emerges as a consistent predictor of higher success likelihood across the diverse model specifications examined.

When success is defined strictly along the mergers and acquisitions pathway, the location of startups within industry strongholds is significant, consistent with Ahluwalia and Kassicieh (2021). This highlights the benefits of proximity to potential acquirers, suppliers, and customers within sectoral clusters in enabling liquidity events like acquisitions. The presence of deep-pocketed corporate entities and maturing startups in mature industry hubs provides ripe targets for mergers. Established networks with incumbents also help venture investors identify prospective acquirers.

On the other hand, for IPOs, navigating the intricacies of securities regulations and public market norms requires different capabilities, where access to expertise and relationships conferred by networking with other sophisticated investors across clusters proves more beneficial. This explains the particular salience of venture capitalists' presence in leading financial hubs for IPO success.

Interestingly, and contrary to hypothesis four, we found that the probability of a startup's exit through IPO is not amplified when the startup and the VC firm are co-located. Instead, startups that are not co-located with a VC firm have a higher probability of success through an IPO. Our findings align with [Chen et al. \(2010\)](#), who also found that non-local VC investments outperform local VC investments. This underscores how modern technology enables remote collaboration, allowing sophisticated investors to nurture high-potential companies across multiple regions. The findings are consistent with literature demonstrating a lower local bias among seasoned venture capital firms equipped with expanded networks spanning domains and geographies ([Sorenson and Stuart 2001](#); [Cumming and Dai 2011](#)). Furthermore, the results indicate an interplay between industry and financing clusters. Startups located in their respective sectoral clusters exhibit a higher success likelihood when their affiliated venture firm is also present within an eminent financing ecosystem. This resonance suggests that the networks, industry knowledge, and access to relationships that experienced venture capitalists develop across both dimensions compound benefits beyond individual factors. These findings extend existing perspectives on how cluster proximity advantages startups ([Sorenson and Stuart 2001](#); [Folta et al. 2006](#)) by outlining this complementary interdependency.

7. Limitations and Future Research

The findings of this study must be interpreted in light of certain limitations, which provide promising opportunities for future research. First, the sample relies on venture capital data from SDC Platinum spanning the 1980s to 2014. The use of this archival database imposes constraints, as some deal information may be erroneous or missing. Applying the methodology to other emerging proprietary datasets could corroborate the findings.

Second, while the 34-year span of the study helps to make the findings more general, examining a longer time horizon could reveal changes in the dynamics between venture capitalists and startups. Emerging platforms, e.g., for online fundraising and remote work, may be altering the importance of geographic proximity. Replicating the study over an extended period would demonstrate the evolution of these relationships.

Third, the analysis did not account for changes in venture capital investing style over time, commonly referred to as style drift. As funds mature, VCs often shift toward less risky investments ([Hochberg et al. 2007](#)). Controlling for measures of style drift could strengthen the results by ruling out this potential omitted variable bias.

Fourth, the study did not explicitly control for educational ties or research institutions within the cluster variables. Proximity to universities and shared educational backgrounds between VCs and entrepreneurs could confer additional benefits not fully captured ([Sorenson and Stuart 2001](#)).

Fifth, the paper relies on proxies for VC reputation and startup quality, which might not fully capture the nuances of these complex constructs. Refining these proxies in future research could lead to a more nuanced understanding of the relationships observed in this study.

Furthermore, the analysis did not fully explore heterogeneity across different industry sectors and subsectors. While industry fixed effects were included, the conclusions may not uniformly hold when examined at a more granular level. Testing the relationships separately for sectors like healthcare, enterprise software, consumer internet, etc. could reveal important nuances.

Finally, the archival regression approach could be complemented by qualitative methods like interviews with practitioners to obtain detailed perspectives on cluster participation. This mixed-methods approach would provide greater context.

8. Conclusions

In conclusion, this study offers distinctive perspectives at the intersection of entrepreneurial finance and economic geography, elucidating the role of industry and financing clusters in shaping startups’ prospects. It challenges binary conventions that spotlight the locations of either venture capitalists or the ventures themselves. The findings reveal a more intricate reality, underlining interdependencies between critical components of modern entrepreneurial ecosystems.

Seasoned venture capitalists embedded within prominent financial hubs consistently emerge as pivotal drivers of startup success. However, the picture differs for disparate exit pathways, with proximity to potential acquirers in industry clusters and access to public market gatekeepers proving selectively valuable. These nuances underscore the merits of multifaceted lenses examining how entrepreneurial hotspots cultivate new frontiers of innovation and growth.

The study emphasizes the strategic importance of startup geographic positioning within venture capital (VC) financing clusters and industry clusters for entrepreneurs. It informs entrepreneurs about the dynamics between these clusters, emphasizing that success is not solely dependent on capital availability but also on industry-specific agglomerations. For venture capitalists, the study suggests recognizing their role as value-added partners beyond capital provision. Policymakers are advised to foster environments that facilitate the coexistence of both VC financing and industry clusters to replicate the success of entrepreneurial hubs. The findings offer actionable insights for optimizing strategies and cultivating robust entrepreneurial ecosystems.

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Abbreviations

Variable	Definition
Startup in VC Cluster	We designate a startup as a cluster company if its metropolitan statistical area (MSA) code aligns with any of the top 10 VC cluster MSA codes. The variable “Startup in VC Cluster” assumes a value of one in such cases and zero otherwise.
Startup in Industry Cluster	By identifying the top 10 MSAs for each Standard Industrial Classification (SIC) code based on the highest number of companies, we

VC in VC Cluster	classify a startup as a cluster company if its MSA code matches any of the top 10 industrycluster MSA codes. The variable “Startup in Industry Cluster” is assigned a value of one in this scenario and zero otherwise. A VC firm earns the classification of a cluster VC firm if its MSA code corresponds to any of the top 10 VC cluster MSA codes. The variable “VC in VC Cluster” is then set to one; otherwise, it assumes a value of zero.
ExitSuccess	The variable “ExitSuccess” is assigned a value of 1 if a startup undergoes an IPO or is acquired, signifying success. Conversely, if the startup becomes defunct or goes bankrupt, the variable is set to 0. In cases where “ExitSuccess” is defined solely for IPOs, it takes a value of 1 if the startup undergoes an IPO and 0 otherwise.
Industry	Portfolio companies are classified into six industries by SDC Platinum, namely biotechnology, communications and media, computer-related, medical/health/life science, semiconductors/other electronics, and non-high-technology. Industry dummy variables are created for each of these industry groups.
Number of Rounds	This variable captures the total number of funding rounds received by a startup.
Follow-On Fund	If the VC fund investing in the startup is a repeat fund, the variable “Follow-On Fund” takes a value of one.
Total Amount Invested	The variable “Total Amount Invested” represents the cumulative dollars invested by the VC fund in the startup.

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