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# External Interfaces or Internal Processes? Market Positioning and Divergent Professionalization Paths in Young Ventures

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**Abstract.** We explore how the initial market positioning of entrepreneurial ventures shapes how they professionalize over time, focusing specifically on the development of functional roles. In contrast to existing literature, which presumes a uniform march toward professionalization as ventures scale and complete developmental milestones, we advance a contingent perspective, distinguishing between the development of external interface functions (marketing & sales and customer development) and internal process functions (accounting, human resources, and finance). Specifically, we argue that positioning in an unconventional market space raises demand for external engagement that focuses ventures' attention and resources toward developing external interface roles. At the same time, such unconventional ventures are less apt to elaborate their internal process roles relative to more conventional peers. We test these predictions using a novel longitudinal data set on the internal organizations of 3,748 U.S.-based entrepreneurial ventures. In contrast to common assumptions of convergent professionalization, our theory and findings advance the perspective that ventures pursue divergent professionalization paths based on their initial market positioning as they scale up.

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## Introduction

"Professionalization"—the dynamic process through which fledging enterprises come to mirror the modes of organizing of established corporations in their field—is a constitutive element of organizational development and scaling in young ventures (Greiner 1972, Mintzberg 1979, Colombo et al. 2016, Gulati and DeSantola 2016). Extant research highlights how a combination of organizational growth and pressures from investors spurs the professionalization of key systems, such as finance, human resources, and marketing, in growth-oriented ventures (e.g., Hellmann and Puri 2002), leading to the elaboration of different functional roles in the organization (Beckman and Burton 2008, Ferguson et al. 2016). In general, prior work gives the impression that professionalization occurs relatively uniformly across ventures, at least among those that interact with sophisticated resource

providers, such as venture capitalists (Wasserman 2003, Pahnke et al. 2015). Research suggests that, as ventures progress through developmental milestones in which they interact with external capital providers, such as venture capitalists, they are subject to professionalization pressures that push them down a path toward elaborating their functional role structures to align with common templates as they scale up (DeSantola and Gulati 2017). Describing this process, Rindova et al. (2009, p. 483) note, "[A]lthough venture capitalists (VCs) may provide financial resources that enhance the economic potential of a new venture, they ... may serve to reproduce structures of power, [and] reduce variety in organizational forms and strategies."

Yet many ventures seem to fail to converge with aspects of standard professionalization "playbooks," particularly those associated with key internal process

functions (i.e., accounting, human resources, and finance). Even large ventures that have raised multiple rounds of financing from venture capital (VC) investors—and, thus, might otherwise be expected to have professionalized functional roles in such areas—have been caught in public stumbles as they scale up. The discrepancy has prompted a flurry of dialogue and debate among practitioners and the press. “Why are private companies struggling so badly with their internal controls?” startup blog *VentureBeat* recently queried. “Specifically, they’re failing to give adequate attention to data quality, audits, regulatory compliance, and necessary financial practices” (French 2019). Noting high-profile mishaps of startups concerning human resources issues, *Entrepreneur* magazine griped, “Uber didn’t even hire a head of HR until it had already hit 500 employees” (Haugh 2017), while *Recode* tried to investigate “how Uber got into this human resources mess” (Bhuiyan 2017).

These examples suggest that ventures do not uniformly follow a singular professionalization path as they scale. But are they isolated incidents, or is something more systematic at work? A long line of research in contingency theory reveals how firms are exposed to different environmental pressures that can become mirrored in how they organize (Dill 1958, Simpson and Gulley 1962, Lawrence and Lorsch 1967, Thompson 1967). Within the new venture context, research highlights the unique set of environmental pressures faced by pioneering ventures that bring together existing market categories and recombine them to craft new market positions or even industries (Schumpeter 1934, Nelson and Winter 1982). We refer to such firms as “unconventional ventures.” The innovation landscape is replete with examples of unconventional ventures, which have pioneered industries ranging from social finance (McDonald and Eisenhardt 2020) to air taxis (Zuzul and Tripsas 2020), satellite radio (Navis and Glynn, 2010, 2011), and nanotechnology (Wry et al. 2014). Uncertainty and ambiguity permeate these and other nascent market contexts (Ozcan and Eisenhardt 2009, Santos and Eisenhardt 2009, Agarwal et al. 2017, Moeen et al. 2020). Absent similar alters, ventures that pioneer unconventional market spaces may be more apt to engage in external advocacy in order to facilitate coherence, raise awareness, and garner support for their nascent markets (Weber et al. 2008, David et al. 2013, Lee et al. 2017, Zuzul and Edmondson 2017). In this paper, we ask: Could pressures to partake in external engagement emanating from positioning in an unconventional market space help explain the variation in how ventures elaborate their role structures as they professionalize? The limited prior research exploring variability in development paths across ventures focuses principally on the backgrounds and decisions of founders and early top

management members themselves in influencing the evolution of their firms (Higgins and Gulati 2003, 2006; Agarwal et al. 2020), including subsequent levels of bureaucratization (Baron et al. 1999b) and how roles are formalized and structured therein (Beckman and Burton 2008).

In the present paper, we bridge the study of young venture professionalization with the growing body of work on how ventures navigate nascent industries (Agarwal et al. 2017, Moeen et al. 2020). In doing so, we explore how heterogeneity in market positioning becomes reflected in how firms professionalize. Building on the organizational design literature, we clarify and describe two divergent professionalization paths that new ventures take as they scale and go through typical developmental milestones. The first path leads a venture to focus more intensively on building out external interface roles that facilitate engagement with outside audiences (i.e., marketing & sales and customer development), the second to focus more intensively on elaborating internal process roles that facilitate the standardization and control of internal activities (i.e., accounting, human resources, and finance) (Thompson 1967, Mintzberg 1979). In distinguishing between external interfaces and internal processes, we refine prior conceptualizations of professionalization that have blended distinct sets of activities associated with each role type into an aggregated and/or unitary professionalization construct (see Hellmann and Puri 2002).<sup>1</sup>

We propose that young ventures unevenly advance along these two interlaced paths in accordance with their initial market positions. Specifically, we propose that ventures operating in a nascent market space are more apt to extensively build out external interface roles because they face heightened demands for engagement work emanating from their unconventional market position (e.g., Hiatt et al. 2009, Khaire and Wadhvani 2010, David et al. 2013). In parallel, such demands pull resources and attention away from internal process roles, especially as the venture matures (Zuzul and Edmondson 2017). By contrast, we propose that ventures that begin in more established markets face fewer pressures to engage in external engagement yet are likely to face higher pressures to conform to resource providers’ expectations about elaborating internal process roles. As a result, we expect conventional ventures to more extensively elaborate their internal process functions relative to unconventional peers.

We test these predictions using a novel longitudinal data set on the internal organizations of 3,748 venture capital-financed entrepreneurial ventures based in the United States. The development of professionally financed entrepreneurial ventures has long been of interest to organizational scholars (Eisenhardt and Schoonhoven 1990, Baron et al. 1999b, Pahnke et al. 2015). The

present study is among the first to focus specifically on market-based heterogeneity in professionalization paths and to bridge the study of nascent industries with role elaboration in developing ventures. We supplement our quantitative analyses with insights from 30 interviews with founders, venture capital investors, and entrepreneurial team members. In contrast to common assumptions of *convergent* professionalization (Hellmann and Puri 2002, Rindova et al. 2009), our theory and findings advance the perspective that ventures pursue *divergent* professionalization paths based on their initial market positioning as they scale up.

## Theory and Hypotheses

### External Interfaces and Internal Processes: Markers of Professionalization

Firm professionalization is the dynamic process through which fledgling enterprises come to mirror the modes and characteristics of organizing of established corporations in their field as they scale up (Mintzberg 1979, Aldrich and Ruef 2006, DeSantola and Gulati 2017). Professionalization is accompanied by several transformations, including horizontal and vertical structural differentiation and the introduction of experienced or otherwise credentialed members into the firm's upper echelon (Higgins and Gulati 2006, Kaehr Serra and Thiel 2019). Critically, professionalization entails the elaboration of roles in key functional areas of the organization (Beckman and Burton 2008, Ferguson et al. 2016), which is the focus of the present study.

Whereas classic studies of professionalization predominantly train a spotlight on how firms internally navigate the division of labor and integration of effort (Blau et al. 1966, Pugh et al. 1968, Galbraith 1982), a more recent body of scholarship situates professionalization within processes of external resource mobilization (Hellmann and Puri 2002, Rindova et al. 2009). Building on Stinchcombe's (1965) discussion of the liability of newness, numerous studies note how deficits in social and financial resources can push young ventures to seek funding from external capital providers to sustain ongoing operations (Brush et al. 2001, Clough et al. 2019). For growth-oriented technology ventures whose initial product or business model concepts often require significant capital to get off the ground, a specialized type of financial intermediary—the VC investment firm—constitutes a critical resource provider (Gompers and Lerner 2004, Hsu 2007). As professional investors, VCs play an active role in their portfolio companies, taking board seats, providing access to their networks, and advising on priorities and goal setting (Garg and Eisenhardt 2017, Wasserman 2017). In the process, they play a central role in inducing ventures to develop functional roles

and endowing those ventures with resources that enable professionalization processes to advance (Ferguson et al. 2016). They also provide guidance and social heuristics (Garg 2013, Pahnke et al. 2015), which can lead portfolio companies to conform to widely accepted templates.

The involvement of VCs in a venture is not a single event, but an extended and rhythmic process punctuated by regular financing milestones. To limit risks to capital, VC firms stage their investments across a series of rounds, enabling them to decline future investment in firms they do not believe have met success criteria (Gompers and Lerner 2004). Venture capital financing rounds are labeled in a standard alphabetic manner with check size and firm valuation typically increasing in each subsequent round (Byers et al. 2018). Raising each subsequent round of venture capital funding represents a critical milestone in the venture's progress down a professionalization path that—in the rarest and most successful cases—culminates in an initial public offering (IPO) (Fisher et al. 2016), a final milestone that returns the most cash and publicity to VC investors (Demers and Lewellen 2003, Gompers and Lerner 2004).<sup>2</sup> The implicit suggestion is that professionalization happens rather uniformly across ventures as they progress through developmental milestones, such as VC fundraising rounds and the IPO (see especially Hellmann and Puri 2002). Specifically, research proposes that the investors with whom ventures engage during these milestones are guided by heuristics shaped by their prior investment experience (Pahnke et al. 2015). This suggests relatively even professionalization of ventures that have crossed equivalent developmental milestone thresholds.

The focal lens through which past work explores this process is through that of *convergent professionalization*: as entrepreneurial ventures march through developmental milestones, interact with VC investors, and mobilize financial and nonfinancial resources, they are uniformly pushed to develop a common set of functional roles and activities. Indeed, foundational work by Hellmann and Puri (2002) highlights the influence of VCs on functional areas as diverse as marketing and sales, human resources, and accounting and finance. VC influence is multifaceted and includes the adoption of certain practices (such as formalized human resource processes or stock option plans to incentivize key executives) as well as the formalization of key roles and the recruitment of executives of sufficient credentials to occupy these roles (Baron et al. 1999a, Hsu 2004, Maula et al. 2005). In the process, venture capitalists drive a process of gradual convergence wherein ventures move progressively closer to the idealized template of what it means to be a mature corporation as they scale (Wasserman 2012, Pahnke et al. 2015).

Whereas past research identifies a variety of functional roles and activities that are shaped by VC involvement over time, research and practice commonly bundle these collective changes into a unitary professionalization construct (Hellmann and Puri 2002, Gulati and DeSantola 2016). Yet a close examination of this professionalization construct through the lens of the organizational design reveals that it encompasses at least two distinct role elaboration processes. The first entails an adjustment to the organization's external interface function, the second an adjustment to its internal process function (Thompson 1967). Examples of external interface roles include the marketing & sales as well as the customer development functions. They facilitate the firm's engagement with outside audiences (Mintzberg 1979). External interface roles' locus of attention falls outside the firm's boundaries, rendering such interfaces critical translators, advocates, and brokers of the firm's offerings with the external environment (Thompson 1967). By contrast, internal process roles facilitate the routinization, standardization, and control of internal activities (Mintzberg 1979, Bermiss and Murmann 2015). Examples of internal process roles include the accounting, human resources, and finance functions. Analytical in nature, their attention falls inside the firm boundaries (Hayes and Abernathy 1980).<sup>3</sup>

In summary, prior research presumes professionalization of both the external interfaces and internal processes as ventures progress through developmental milestones (e.g., fundraising rounds and an IPO), enabled by both the resources and the guidance brought forth by the VCs.

**Baseline Hypothesis A.** *Entrepreneurial ventures that have completed a greater number of developmental milestones have better developed external interface roles than those that have completed fewer milestones.*

**Baseline Hypothesis B.** *Entrepreneurial ventures that have completed a greater number of developmental milestones have better developed internal process roles than those that have completed fewer milestones.*

### Divergent Professionalization Paths

Embedded in the baseline hypotheses is the assumption that entrepreneurial ventures are subject to a relatively uniform set of professionalization pressures from investors that promote convergence in patterns of organizing as the ventures progress through milestones (Hellmann and Puri 2002, Maula et al. 2005, Rindova et al. 2009, Fisher et al. 2016). Yet there are strong reasons to expect that ventures that are exposed to different environmental conditions follow divergent professionalization paths as they scale up. The central premise of contingency theory is that firms are subject to different environmental conditions

that become reflected in how they organize, leading to differentiated developmental patterns across organizational subunits, units, and fields (Burns and Stalker 1961, Lawrence and Lorsch 1967, Thompson 1967, Child 1972). Contingency theory suggests a negotiated process of alignment between a functional role structure and contingency factors, including external uncertainty and the degree of environmental dynamism (Raveendran et al. 2020).

Focusing on new ventures, a growing body of scholarship on nascent markets highlights how the relative unconventionality of the market space a venture seeks to occupy constitutes a key environmental contingency, one that introduces unique demands for organizational structure and action (McDonald and Gao 2019, Moen et al. 2020, Zuzul and Tripsas 2020). Although all recently founded ventures are "new" in the sense that they are close to their birth, not all are "novel" in terms of the market position they strive to occupy (Kimberly 1979, Amason et al. 2006). More specifically, whereas some simply imitate the market positions of companies that have come before them, others pioneer unconventional market spaces (Agarwal and Bayus 2004, Durand and Khaire 2017, McDonald and Eisenhardt 2020). Many new firms do not fit neatly into well-grooved market spaces at their birth, but instead (re)combine existing market categories in unusual ways (Wry et al. 2014) to craft new market positions or even industries (Schumpeter 1934, Nelson and Winter 1982).<sup>4</sup>

Given the uncertainty and ambiguity inherent in nascent markets, prior research highlights how pioneering an unconventional market space can introduce unique demands for external explanatory and advocacy work (Navis and Glynn 2010, David et al. 2013, Zuzul and Edmondson 2017). Relative to new firms that simply follow established market positions, unconventional ventures that combine disparate market categories are more poorly understood by key stakeholders because they do not fit into existing market structures and interactions (Hargadon and Douglas 2001, Khaire and Wadhvani 2010). For these firms, the market spaces they are striving to occupy are inherently ambiguous because they lack "recurrent, institutionalized patterns of relations and actions" (Santos and Eisenhardt 2009, p. 644). In addition, ventures that do not fit neatly into existing market niches face the simultaneous challenges of legitimizing both their own constitutive organization and the nascent market they are pioneering (Aldrich and Fiol 1994). To overcome these deficits, ventures that pioneer nascent markets are more apt than conventionally positioned ventures to engage vigorously with outside audiences to elevate awareness, garner support, and facilitate understanding (Stinchcombe 2002), using a high-touch approach to promote their market and their venture's product or service offering effectively.

Our interviews with investors and industry informants reinforce the idea that firms that position themselves in unconventional market spaces have a heightened propensity to engage in external advocacy. According to a VC, for “those sorts [of] new market cases...it’s not enough to just say, hey, we’re doing something different. It’s like you want the buyer to literally say: I am identified with this new market, and I want to be evangelizing. I want to be part of this community. I want to feel like I’m part of something new.” The interviewee remarked, “HubSpot invented the term inbound marketing, and not just invented it. They created a conference called Inbound. People started marketing themselves on LinkedIn as an inbound marketer, and they created the whole ecosystem.” This sentiment was echoed by an early joiner (i.e., an early hire) of a Bay Area venture, who described pressures the firm felt to bring attention, legitimacy, and coherence to the cell-cultured meat market, in which even what to name the product category is subject to debate: “I think we quickly realized that there are big questions that the entire industry is facing, and somebody needs to start moving to answer them. And because we are the latest stage company in an early industry, a lot of that has fallen on our shoulders.”

Drawing on the rich body of work dating back to contingency theory and more recent work on the sociology of entrepreneurship, we propose that such heightened pressure for external engagement emanating from their distinctive market position becomes reflected in how unconventional ventures build out their organizational role structures. Specifically, we anticipate that positioning in an unconventional market space at the time of founding pushes ventures to more extensively develop external interface roles by raising demands for engagement on behalf of their nascent industry (e.g., Weber et al. 2008, McDonald 2021). Environmental conditions at the time of founding, such as market unconventionality, have lasting effects on subsequent organizational structures, becoming deeply ingrained because of inertial and institutional forces (Stinchcombe 1965, Marquis and Tilcsik 2013). Furthermore, for ventures that pioneer nascent markets, facilitating external comprehension and acceptance of their unconventional market positioning often presents a substantial bottleneck to continued progress (McDonald and Gao 2019). The binding constraint to their growth is the size of their market audience; thus, a priority for allocating resources should be facilitating external understanding and receptivity.

These arguments lead us to two predictions. In the aggregate, we posit that, *ceteris paribus*, firms that face heightened pressures to engage in external advocacy on behalf of their unconventional market space early in their life exhibit a higher level of professionalization of external interface roles (i.e., marketing & sales and customer development) compared with more

conventionally positioned peers. Furthermore, we anticipate that, to alleviate the key binding constraint to their growth, unconventional firms continue to disproportionately channel both attention and resources to external interface functions as they progress through developmental milestones. The cumulative impact of such sustained investment into the external interface functions leads to a widening gap between unconventional and conventional ventures over time. As a result, the more milestones an unconventional venture has passed, the higher the rate of professionalization of its external interface structures relative to conventional peers:

**Hypothesis 1.** *Entrepreneurial ventures that exhibit a higher degree of market unconventionality at the time of their founding have better developed external interface roles.*

**Hypothesis 2.** *The positive effect of the degree of market unconventionality at the time of founding on the development of external interface roles is larger for entrepreneurial ventures that have achieved more developmental milestones.*

Market positioning is also likely to differentially influence the professionalization of internal process roles, such as accounting, human resources, and finance. There are three relevant strands of research that offer insight into how positioning in an unconventional market space could influence ventures’ propensity to develop internal process roles. These strands alternatively emphasize (1) the finite attention and resource bases of entrepreneurial ventures, (2) links between internal process functions and technical efficiency, (3) the relative dearth of institutions and cognitive referents in nascent markets.

The first strand of research, situated within the attention- and resource-based views of the firm, suggests that the more intensive focus of unconventional firms on external engagement pulls attention and resources away from other aspects of professionalization, such as building internal process roles. Because new ventures operate under conditions of resource constraint, they inevitably face choices in how they allocate organizational finances, attention, and time (Ocasio 1997, Clough et al. 2019). A founder of a personal finance startup described to us how founders faced with these trade-offs are apt to allocate attention and resources more intensively to building the functional areas of the organization that pose the greatest bottleneck (Bremner and Eisenhardt 2022): “At any given point, you’re going to have pieces of your organization that are relatively full and pieces of the organization that are acting as bottlenecks ‘cause there aren’t enough resources. If you’re growing... whatever [the bottleneck] is, you want to be able to make this

machine align itself, and you need to be able to resource against those different departments in a way that's in balance." For unconventional ventures, the challenges of overcoming deficits in external understanding and buy-in of their nascent market space are often described as the most critical bottleneck constraining success (Aldrich and Fiol 1994, Wry et al. 2011). As such, unconventional ventures should be more likely to appropriate resources to roles that address these concerns rather than to process roles that focus on standardization and control of internal activities.

The second strand of research takes a *technical* perspective. Classic research in organizational design suggests that internal process functions are essential for maximizing the efficiency of execution (Burns and Stalker 1961, Mintzberg 1980), a critical success factor for companies positioned in conventional spaces and, thus, facing more severe competition (cf. Romanelli 1989). The importance of technical efficiency in established markets surfaced in a VC interview that we conducted: "Zoom is an epic example [of an efficiency-focused company in an established market space]. Video conferencing is not new. Every company has been doing it for 20 years. There are ten players... Eric Yuan is not, in any way, a visionary about video conferencing. He's not a thought leader in any way, shape, or form. He's invented no new categories, but he just out-executed everyone else, right?" By contrast, ventures competing in nascent markets have more leeway to attend less to efficient execution as they typically lack direct competitors. From a technical perspective, internal process roles increase efficiency by helping the firm generate standardized metrics and measures, thereby facilitating comparison and commensuration across the firm's subunits (Ouchi 1979). In this manner, internal process roles can help promote coordination and control, which are key to effective execution (Thompson 1967, Mintzberg 1979, Galbraith 1982). They can also insulate the firm against noncompliance with legal and regulatory regimes (Dobbin et al. 1993, Kelly and Dobbin 1998), which are more likely to pervade established markets than nascent markets, in which they may still be indeterminate or evolving (Gao and McDonald 2020).

The third strand of research, aligned with *institutional* theory, further suggests that ventures that position themselves in unconventional market spaces may face less pressure to elaborate internal process roles. Market structures are often undergirded by cultural and cognitive institutions that provide templates for organizing (Meyer and Rowan 1977, DiMaggio and Powell 1983, Zucker 1987). Within a given market space, reproduction in patterns of organizing is often promoted by a shared understanding of the rules of the game, that is, "the formal and informal principles

of action, interaction, and interpretation that guide and constrain decision-makers" (Ocasio 1997, p. 196). However, ventures that pioneer unconventional market spaces operate amid an "institutional vacuum" (Aldrich and Fiol 1994, p. 645). Unlike firms that compete in established market domains, shared social understandings about what the venture is and how it should operate are scant (Khair and Wadhvani 2010, David et al. 2013). In effect, the rules of the game are still undefined and in flux (Gao and McDonald 2020). Moreover, for unconventional ventures, "cognitive referents" may not exist to epitomize how they should organize (Santos and Eisenhardt 2009, p. 648; McDonald 2021). For example, many venture capital firms investing in new ventures limit their scope to specific market verticals (Sorenson and Stuart 2001). Just as investment analysts often struggle to evaluate conglomerates (Zuckerman 1999), VCs may struggle to analogize around and make sense of ventures that combine disparate market categories. Absent similar alters, it may be more difficult for investors to draw analogies regarding the appropriate time for ventures to build functional roles and encourage their portfolio companies to implement changes.

In the absence of such cognitive referents, ventures should experience less pressure to develop internal process roles given that there is not an established precedent for when and how ventures should build out those functions. Because internal process functions are frequently maligned by entrepreneurs suspicious of bureaucratic red tape (Strauss 1974, Gulati 2019), albeit often without evidence, unconventional firms may delay building such roles. An early joiner of a New York-based startup described this common situation to us: "What we've done is create a model that's a category definer, but it's also more complex than any retail model, and it hasn't been done before... [We have to ask]: Is it important to just get something done, or do we need to slow down and set up a process instead? If you do too much of this, of course, you lose the special sauce."

Conversely, firms that position themselves in more established markets experience heightened VC investor pressure to professionalize because of the availability of similar alternatives. First, investors frequently use cognitive analogs to derive heuristics that guide their portfolio companies. When asked by the authors about advice for a cloud-based portfolio company about scaling its internal organization, a San Francisco-based VC partner drew comparisons to other successful cloud-based companies: "It's funny for me, having seen this movie before... for example, I've [followed] Salesforce.com for 10 years to see what they've done, and to see Oracle and SAP, and now we are having [this particular cloud-based startup] come in and do the same thing as all the other guys... [You

are sort of downloading those processes and patterns.”

In sum, three strands of research—*attention and resources*, *technical*, and *institutional*—unite in anticipating that firms that position themselves in unconventional market spaces should be less likely to build out internal process roles. They are guided by different assumptions. The first strand assumes a zero-sum game in which external engagement on behalf of an unconventional market space draws attention and resources away from internal process roles (Ocasio 1997). The second strand assumes that internal process roles confer particular technical advantages to firms that are conventionally positioned and that efficient execution is of elevated importance to such firms (Burns and Stalker 1961, Mintzberg 1979). The third strand assumes that there is less of a basis for shared understandings about how firms should organize in nascent markets (Aldrich and Fiol 1994) and there is less of a basis for cognitive analogizing. A lack of cognitive referents gives unconventional ventures the space to put off elaborating internal process roles, which entrepreneurs frequently malign (e.g., Gulati 2019); by contrast, conventional ventures are not afforded the luxury to evade investors’ pressure to implement internal controls. Although the underlying assumptions behind these strands of research are distinct, they lead to the equifinal predictions noted as follows.

Ultimately, these arguments lead to two predictions. First, we expect unconventional firms to have a lower level of elaboration of their internal process functions than otherwise similar conventional peers. Furthermore, we expect this gap between conventional and unconventional firms to grow with every developmental milestone passed. Unconventional firms should be less likely to prioritize internal process role development as they continue to channel both attention and resources to external interface roles to alleviate their binding constraints to growth. By contrast, conventional firms face greater—and clearly articulated—cognitive and technical pressure to elaborate their internal processes and, thus, are apt to more intensely allocate resources mobilized at developmental milestones to professionalizing internal process roles. These differential investments of attention and resources accrue with each developmental milestone, leading to a widening gap between conventional and unconventional ventures.

**Hypothesis 3.** *Entrepreneurial ventures that exhibit a higher degree of market unconventionality at the time of their founding have less developed internal process roles.*

**Hypothesis 4.** *The negative effect of the degree of market unconventionality at the time of founding on the development of internal process roles is larger for entrepreneurial ventures that have achieved more developmental milestones.*

## Data and Methods

Given that entrepreneurial ventures are small and privately held, data on their internal organizations is often difficult to access (Wasserman 2003, Eisenhardt 2010). To test our professionalization hypotheses, we developed a novel longitudinal data set. We began by drawing a sample of U.S.-based technology ventures from Crunchbase, a reference site for information on entrepreneurial ventures and their investors (Ter Wal et al. 2016, McDonald and Allen 2022). We next obtained resume data from a popular online career networking website for all individuals who claimed to have past or present work experience at one of the ventures in the sample. From these resumes, we gathered first names, self-reported venture start and end dates, and job titles within the venture. We also collected information on their education and careers prior to and post participation in the venture.

The coverage of these data is strong. The median number of individual resumes collected was 81 per company with a 25th to 75th percentile range of 30 to 191. Other researchers working with similar online resume samples from technology workers suggest that they are about 90% accurate and have lower false-negative rates than other potential sources of employment data, such as patents (Ge et al. 2016). The advantages of our data include (1) wide coverage, particularly among skilled technology workers and professionals such as those who comprise the majority of our sample; (2) the ability to collect information on junior employees (prior entrepreneurship research focuses almost exclusively on top management teams); and (3) less susceptibility to response rate bias than survey data.

We used employment start and end dates to retrospectively reconstruct who was joining and leaving the venture over time. We aggregated the attributes of these individuals to the firm-year level. The final matched sample consists of 31,595 firm-year observations across 3,748 unique ventures. The earliest venture in the sample was founded in 1994 and the latest in 2014, with the median founding year being 2006.

Although our present study primarily relies on these quantitative archival data, we also conducted 30 supplemental interviews with startup founders, VC investors, and entrepreneurial team members. The interviews were semistructured and focused broadly on the dynamics of professionalization and internal organizational development in young ventures. Respondents were identified and recruited via snowball sample. The interviews ranged in duration from 0.5 to 2.5 hours (mode of one hour) and were transcribed for analysis; more than 10 were conducted onsite at the informant’s startup or investment firm. We also attended several conferences and pitch competitions at which entrepreneurial ventures network with each



other and with investors. The interviews brought texture to our understanding of measures used in the quantitative research and bolstered our understanding of the mechanisms underlying our hypotheses.

### Cleaning and Developing the Data Set Variables

After we obtained the resume data, we addressed the challenge of idiosyncrasies and variation in how individuals listed similar, if not identical, organizational roles (e.g., eng. dir. versus director of engineering). Building on prior literature on job categories in entrepreneurial ventures (Beckman and Burton 2008), we first developed a set of more than 3,000 hand-coded job titles, which we sorted into one of 15 different functional role areas: marketing/sales, customer development, accounting, human resources, finance, science/engineering, product management, design, information systems, operations, administrative support, public relations/communications, media/publishing, legal, and academic.<sup>5</sup> We then used this hand-coded data set to train a maximum entropy model in R (Jurka and Tsuruoka 2015) to sort the remainder of job titles in our data set into the 15 functional role groups using natural language processing techniques. Unsorted job titles were assigned to a 16th unmatched residual category.

A second coder then hand-checked the output of the natural language processing model for accuracy. First, we hand-checked 987 unique job titles, which comprised half of the person-firm-year job titles in the data set. Results from this check indicated that 83.9% of the most common job titles were sorted correctly by the maximum entropy models; sorting was updated to reflect the results of this check.

Moreover, given the long tail of idiosyncratic job titles that we discovered—there appears to be much fragmentation in labeling and nomenclature—we checked and updated all job titles that contained strings that we deductively determined could relate to our dependent variables. These strings were determined by consulting with a former senior human resources executive at a prominent technology firm. In total, 11,378 unique potential job titles were checked to determine correct sorting. As was done with the common job titles, following this check, the sorted job categories were updated to ensure accuracy.

### Dependent Variables

We test our hypotheses across two external interface role types (marketing & sales and customer development) and three internal process role types<sup>6</sup> (accounting, human resources, and finance). Our goal in using two different external interface and three different internal process dependent variables is to show divergent patterns of influence of the independent variables across role types that fit within our distinction between external interface functions and internal

process functions. Our interviews support our choice to characterize these role types as representatives of external interface and internal process roles. For example, when asked to describe internal process roles in new ventures, a VC investor at a high-status bicoastal firm said, "... the things I think about are human resources, accounting, financial reporting, so controllers for capital, when do you have a CFO or VP of finance, HR... as process roles not related to [the] product." Another interview with a Boston-based joiner revealed that, at his firm, "sales... client management, relationship management kind of stuff" were all grouped together under the purview of one individual.

The most common 20 job titles for each of these functional areas are presented in Online Appendix A1. As shown by the frequency, there is substantial heterogeneity in how job titles falling into these functional domains are described.

For each of the role types, we develop an index to reflect the degree to which they have been developed within the firm. This index ranges from zero to three. Firms were given one point for each of the following criteria met: (1) presence of the role in the firm, (2) at least one of the role holders having prior work experience performing that role, and (3) the role given status in the organization as reflected by its elevation to the top management team (measured as whether the job holder held a VP, C-suite, or founder title). The use of ordinal scales for the dependent variables is consistent with recent studies that also construct dependent variables based on transforming qualitative information into ordered rankings or indices (for examples, see Ranganathan and Rosenkopf 2014, Jung et al. 2017).

### Independent Variables

We developed a variable to test the baseline hypotheses using the Crunchbase data collected for the present paper. Here, we measured the number of milestones passed based on the completion of venture capital rounds and/or an initial public offering. This variable ranged from zero to four. We coded each of the first three formal rounds of venture capital finance (series A, B, and C) as one, two, and three, respectively. Firms that had completed an initial public offering at time  $t$  were coded as four. Here, we build on prior work that analytically treats raising a round of VC financing and undertaking an IPO as incremental increases in development progress; such work also transforms the attainment of these milestones into a cumulative numeric independent variable (see Ferguson et al. 2016).<sup>7</sup>

To test Hypotheses 1–4, we measured market space unconventionality using a measure of structural constraint (Burt 1992). Crunchbase provides market category group information on companies included in its

database. The overwhelming majority of companies are affiliated with multiple market category groups (average: three) among a possible 46 market groups. We constructed market maps using the market category group information of all VC and private equity (PE) financed companies listed in Crunchbase.<sup>8</sup> In this market map, firms were represented as nodes, and market group overlaps between firms were represented as edges. Edges were weighted by the number of overlapping categorical ties between firms.

Included in each market map were all VC- and PE-financed firms in Crunchbase founded at or before time  $t$ . Conceptually, we were interested in separating firms that combined categories across distal spaces in the map of market category group relationships from those that were located in embedded clusters of market category group ties. For theoretical reasons, we specifically sought to identify firms that did not fall neatly into well-grooved market spaces at the time of their birth given theories of imprinting and the fact that these firms likely face the greatest burden of evangelizing a new market space. To illustrate, Uber was among the first companies to combine the market category groups of software, mobile, (social) apps, and transportation; therefore, in our conceptualization, it operated in an unconventional market space. To operationalize how conventional a market space is, we elected to use Burt's (1992) measure of brokerage, which measures the degree to which a firm spans the structural holes separating disconnected clusters.<sup>9</sup> In other words, brokers have many connections to actors who are themselves disconnected from one another. Within our context, this means that firms that are highest on unconventionality are those whose market categories are common (i.e., a large number of firms share at least one category with them), but they recombine those common categories in uncommon ways (so there are fewer connections among the firms with which they share at least one category). Returning to our Uber example, the firm has a high unconventionality score because it recombines highly popular categories (mobile, (social) apps, transportation) unlike other transportation companies that do not connect with mobile or social applications companies.

Brokerage is the conceptual opposite of constraint: it is the degree of dependence of a given node on a small number of heavily interconnected alters (Burt 1992). We follow the conventional calculation procedure for constraint, using the *i-graph* package in R. Constraint is given by  $\sum_j c_{ij}$ , where

$$c_{ij} = \left( p_{ij} + \sum_q p_{iq} p_{qj} \right)^2, \text{ for } q \neq i, j$$

$$p_{ij} = z_{ij} / \sum_q z_{iq}$$

and  $z_{ij}$  measures the number of shared categories between firms  $i$  and  $j$ .

We used this formula to calculate the market category group constraint of each firm in our sample at the time of its launch. After obtaining constraint scores, we z-score standardized them against other firms located in the market category group map at the time of the venture's birth.<sup>10</sup> Finally, given that we were interested in market unconventionality, which is the conceptual opposite of constraint, we multiplied each score by  $-1$ .<sup>11</sup>

## Controls

We created several control variables. First, we used job start and exit dates at the venture to create a yearly measure of organizational headcount. We split organizational *headcount* by functional area, creating variables that reflected the number of members filling each functional role. All headcount variables were lagged by one year. We also calculated organizational *growth* as  $[1 - (\text{headcount}_t + 1) / (\text{headcount}_{t-1} + 1)]$ . The natural logs of the headcount and growth variables (plus one) were used to account for skewed distributions. Other organizational member controls included yearly *percent male* headcount, measured by identifying the gender of all individuals in the resume data set using genderize.io, an application programming interface that predicts the gender of a person given the person's name. We also approximated the *average age* of individuals working in the startup using the year they obtained their undergraduate degree, assuming that they completed this milestone at the age of 22. We addressed outliers generated by the limitations of this assumption by winsorizing this variable at the 1st and 99th percentiles. We controlled for two aspects of the founding team. We identified founders as individuals who either (1) self-identified as a founder or (2) assumed a C-suite position no later than one calendar year after the firm's founding. From this, we calculated the *founding team size*. We also identified whether at least one of the founders had *prior startup experience* at one of the other early stage ventures in the Crunchbase database, as either a founder or joiner. At a firm level, we control for the *percent turnover* of organizational members in the prior year. We calculated this as  $[(\text{member exits}_{t-1}) / (\text{headcount}_{t-1})]$ . For the founding year, we assumed that turnover at  $t - 1$  was zero. For the turnover variable, we used the natural log (plus one) to correct for skewed distributions. We also included a variable for the raw *number of market category groups* listed for each firm in the Crunchbase database.

As a control, we were also interested in whether peer effects influenced the development of each of the five role types. Put simply, did firms follow the example of firms that resembled them in terms of size and occupied market space? To test this, we divided all ventures in the data set by year and relative size, using industry-accepted size heuristics of 0–50, 51–250,

and 250+ as cutoff points to group firms into size peers (Bussgang 2017). We identified whether each firm had the focal role (e.g., marketing & sales, customer development, accounting, human resources, or finance) during year  $t$ . For every year across each of the size groups, we then calculated the distance between each dyadic pair of ventures in our database based on the shortest path in the market category map. For each of a focal firm's peers, we assigned weights based on the inverse of this distance, then calculated a weighted percentage of peers that had each of the three internal process roles at time  $t$ . Finally, all models include *region*, *founding year*, and *year* dummies to account for geographic and time-related variation.

### Analytic Procedures

The main analyses are conducted using random effects generalized least squares with robust standard errors clustered by firm. Observations are at the firm-year level of analysis. We exclude firm-year observations for which a venture is no longer an independent operating entity because it either failed (based on a Crunchbase failure indicator or because its headcount is zero according to the resume data) or has been acquired and thus integrated into the larger and more mature acquirer organization.

We elected to use random effects (as opposed to fixed effects) given that our measure of market unconventionality is calculated at the time of the firm's founding. Using random effects also allows us to retain observations for which there is no variation on the dependent variable. This prevents bias in the data set in favor of firms that survive to reach the larger size typically associated with firm professionalization.

### Results

Table 1 reports the descriptive statistics and the univariate correlation matrix among the variables across the 31,595 firm-year observations in the final data set. In terms of our professionalization measures, marketing & sales have the highest index (1.7), significantly outpacing the other external interface measure, customer development (0.81). Among the internal process functions, finance is among the most professionalized (0.87), consistent with our interview evidence that VCs regard it as the most crucial process function to develop early;<sup>12</sup> accounting and HR (0.57 each) are the least professionalized of all functions across the sample. The characteristics of the sample are consistent with prior studies of entrepreneurial ventures. On average, each venture in our sample had completed 1.3 milestones (e.g., between series A and B) and had a founding team consisting of 2.1 members, of which 13% had experience as a startup founder or early stage joiner. This

percentage aligns with prior work: Gompers et al. (2010) report that on average, 12.6% of entrepreneurs in the portfolios of the top 40 most active venture capitalists are serial entrepreneurs (e.g., individuals who had founded ventures previously). The estimated member gender composition of the average observation in our sample was 69% male; this finding is unsurprising given that commercially oriented new ventures have traditionally been perceived as male typed (Dimitriadis et al. 2017). In results not displayed, 38% of the sample is located in the San Francisco Bay Area, 11% in Boston, 9% in New York City, 5% in Los Angeles, and 4% in Seattle. The geographic distribution of the sample is consistent with the overall geographic distribution of venture capital-financed startups in the Crunchbase database, suggesting that the results should be representative.

The bivariate correlations between the dependent variables (i.e., the functional indices) and the independent variables are consistent with our expectations. There is a strong positive association (correlation coefficients ranging between 0.39 and 0.44) between the number of milestones completed and the degree of professionalization of both the internal process and the external interface functions. Furthermore, the bivariate correlations between the degree of unconventionality and the functional indices are generally consistent with our hypotheses. The correlations between the development of external interface roles and degree of unconventionality are positive and significant for both the marketing & sales ( $r = 0.08$ ,  $p < 0.001$ ) and customer development ( $r = 0.06$ ,  $p < 0.001$ ). Conversely, we observe a negative association between the level of unconventionality and the development of the accounting ( $r = -0.03$ ,  $p < 0.001$ ) and finance ( $r = -0.02$ ,  $p < 0.001$ ) functions; however, we observe no meaningful bivariate correlation between unconventionality and the professionalization of the HR function.<sup>13</sup>

The correlation matrix also shows generally low correlations among the independent variables with a notable exception being correlations among the variables indicating the size of each functional domain (e.g., the correlations among the number of members with an engineering/science role, number of members with a marketing/sales role, number of members with a product management role, etc.). Using only an aggregated organizational headcount measure (e.g., not breaking out headcount by functional role), however, does not substantively influence the results. Given the apparent (albeit expected) correlation between organizational size and peer adoption of both external interface and internal process roles, we omitted the peer adoption controls and found the results to be substantively unaffected. To check for multicollinearity, we obtained the variance inflation factors for all variables.

**Table 1.** Descriptive Statistics and Correlations

Variable	Mean	Standard deviation	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.	
1. Mkt/Sales index	1.70	1.32	1.00																				
2. Customer index	0.81	1.00	0.52	1.00																			
3. Accounting index	0.57	0.89	0.37	0.38	1.00																		
4. HR index	0.92	0.37	0.40	0.45	1.00																		
5. Finance index	0.87	1.27	0.34	0.34	0.40	0.38	1.00																
6. Num. milestones completed	1.28	1.18	0.44	0.39	0.44	0.39	0.39	1.00															
7. Degree of unconventionalality	0.15	0.76	0.08	0.06	-0.03	0.00	-0.02	-0.01	1.00														
8. Growth (log)	0.28	0.57	-0.25	-0.20	-0.23	-0.17	-0.21	-0.37	0.00	1.00													
9. Headcount (log), t-1	2.16	1.20	0.62	0.59	0.53	0.56	0.47	0.59	0.03	-0.51	1.00												
10. Percent turnover (log), t-1	0.17	0.17	0.32	0.27	0.20	0.20	0.19	0.29	0.01	-0.52	0.43	1.00											
11. Percent male (0-1)	0.69	0.23	-0.08	-0.13	-0.14	-0.13	-0.10	-0.13	0.05	0.07	-0.17	-0.10	1.00										
12. Avg. member age	35.32	6.54	0.01	-0.09	0.07	-0.01	0.09	0.15	-0.03	-0.18	-0.01	-0.05	0.08	1.00									
13. Founding team startup exp.	0.13	0.34	-0.02	-0.00	-0.04	-0.03	0.01	-0.00	0.01	0.06	-0.03	0.00	-0.02	-0.04	1.00								
14. Founding team size	2.12	1.29	0.11	0.10	0.05	0.09	0.16	0.03	0.00	0.02	0.13	0.05	-0.01	-0.06	0.16	1.00							
15. Num. categories	3.24	1.40	0.04	0.03	0.01	0.04	0.02	0.04	0.29	0.03	0.04	0.02	0.02	-0.11	0.04	0.00	1.00						
16. Peer adoption-mkt/sales	0.60	0.14	0.34	0.42	0.39	0.41	0.32	0.52	0.01	-0.27	0.58	0.20	-0.16	0.03	0.09	0.03	0.08	1.00					
17. Peer adoption-customer	0.39	0.18	0.34	0.43	0.40	0.45	0.33	0.48	0.02	-0.24	0.59	0.18	-0.14	-0.00	0.07	0.04	0.07	0.97	1.00				
18. Peer adoption-accounting	0.27	0.18	0.30	0.40	0.40	0.46	0.33	0.43	0.00	-0.21	0.57	0.16	-0.13	0.00	0.04	0.05	0.06	0.91	0.97	1.00			
19. Peer adoption-hr	0.27	0.19	0.29	0.40	0.40	0.46	0.32	0.40	0.01	-0.19	0.56	0.15	-0.11	-0.01	0.03	0.05	0.06	0.88	0.96	0.99	1.00		
20. Peer adoption-finance	0.29	0.16	0.31	0.40	0.40	0.45	0.33	0.44	0.00	-0.22	0.58	0.17	-0.13	0.01	0.04	0.05	0.06	0.92	0.98	1.00	0.99	1.00	

Notes. Across 31,595 observations. Correlations > 0.01 or < -0.01 are significant at the  $p < 0.05$  level.

The maximum variance inflation factor for any non-dummy variable is around three across all of our regressions, suggesting that multicollinearity should not be a concern (Kutner et al. 2004).

The main analyses are presented in Table 2, featuring analogous model specifications predicting the level of professionalization across all five functions of interest. Models 1a and b through 2a and b cover the external interface functions, marketing & sales, and customer development, respectively; Models 3a and b, 4a and b, and 5a and b cover the internal process functions (accounting, HR, and finance, respectively).

Each “a” model in Table 2 presents the main effects, broken out by the functional role dependent variables. To prevent circularity among our independent and dependent variables, from each model, we removed the headcount measure for the function of interest (i.e., we omitted the marketing & sales headcount when measuring the professionalization of the marketing & sales function). The coefficient for the number of milestones completed is significant for all functions, consistent with the idea that, even when controlling for organizational growth and size, the external pressures brought forth by resource providers at each funding round are catalysts for increasing professionalization. This is the case for both external interface roles and internal process roles, supporting our Baseline Hypotheses A and B.

The “a” models also test the main effects of market space unconventionality, measured using reverse-coded, z-score standardized structural constraint (Burt 1992). The measure is significantly positive for both marketing & sales ( $b = 0.09$ ,  $s.e. = 0.02$ ,  $p < 0.001$ ) and customer development ( $b = 0.05$ ,  $s.e. = 0.01$ ,  $p < 0.001$ ), suggesting that, ceteris paribus, more unconventional firms are more likely to have increasingly professionalized external interface functions. This provides consistent support for Hypothesis 1. Conversely, the measure of market unconventionality has a significantly negative coefficient in all specifications predicting internal process function specialization, including accounting ( $b = -0.05$ ,  $s.e. = 0.01$ ,  $p < 0.001$ ), HR ( $b = -0.03$ ,  $s.e. = 0.01$ ,  $p < 0.01$ ), and finance ( $b = -0.06$ ,  $s.e. = 0.02$ ,  $p < 0.01$ ). In other words, ceteris paribus, unconventional firms are more likely to have less heavily professionalized internal process functions as Hypothesis 3 predicts.

Models 1a, 2a, 3a, 4a, and 5a measure the average effects of unconventionality on professionalization. We now turn our attention to how unconventionality is associated with the process of professionalization as the venture evolves through developmental milestones. To this effect, Models 1b, 2b, 3b, 4b, and 5b incorporate the interaction between unconventional market positioning and the number of developmental milestones completed across each functional role. For

**Table 2.** Random Effects GLS Predicting Extent of External Interface and Internal Process Role Development

	Model 1a Mktg/Sales b/ robust s.e.	Model 1b Mktg/Sales b/ robust s.e.	Model 2a Customer b/ robust s.e.	Model 2b Customer b/ robust s.e.	Model 3a Acctng b/ robust s.e.	Model 3b Acctng b/ robust s.e.	Model 4a HR b/ robust s.e.	Model 4b HR b/ robust s.e.	Model 5a Finance b/ robust s.e.	Model 5b Finance b/ robust s.e.
Growth (log)	0.24*** (0.01)	0.24*** (0.01)	0.14*** (0.01)	0.14*** (0.01)	0.07*** (0.01)	0.07*** (0.01)	0.15*** (0.01)	0.15*** (0.01)	0.11*** (0.01)	0.10*** (0.01)
Num. milestones completed	0.07*** (0.01)	0.07*** (0.01)	0.04*** (0.01)	0.04*** (0.01)	0.07*** (0.01)	0.08*** (0.01)	0.04*** (0.01)	0.04*** (0.01)	0.07*** (0.01)	0.07*** (0.01)
Degree of unconventionality	0.09*** (0.02)	0.08** (0.02)	0.05*** (0.01)	0.03* (0.01)	-0.05*** (0.01)	-0.01 (0.01)	-0.03** (0.01)	-0.01 (0.01)	-0.06** (0.02)	-0.03† (0.02)
Unconventionality × milestones		0.01 (0.01)	0.02* (0.01)	0.02* (0.01)	-0.03*** (0.01)	-0.03*** (0.01)	-0.02* (0.01)	-0.02* (0.01)	(0.02)	-0.02† (0.01)
Num. marketing/sales (log), t-1			0.28*** (0.01)	0.28*** (0.01)	0.10*** (0.01)	0.10*** (0.01)	0.05*** (0.01)	0.05*** (0.01)	0.08*** (0.02)	0.08*** (0.02)
Num. customer support (log), t-1					0.08*** (0.01)	0.08*** (0.01)	0.13*** (0.01)	0.13*** (0.01)	0.11*** (0.02)	0.12*** (0.02)
Num. accounting (log), t-1			-0.02 (0.02)	-0.01 (0.02)	(0.02)	(0.02)	0.16*** (0.02)	0.15*** (0.02)	0.14*** (0.03)	0.13*** (0.03)
Num. human resources (log), t-1			-0.08*** (0.02)	-0.08*** (0.02)	0.12*** (0.02)	0.12*** (0.02)	0.07*** (0.02)	0.07*** (0.02)	0.10*** (0.03)	0.10*** (0.03)
Num. finance (log), t-1			-0.01 (0.02)	-0.01 (0.02)	0.10*** (0.02)	0.09*** (0.02)	0.09*** (0.02)	0.09*** (0.02)	0.08*** (0.03)	0.08*** (0.03)
Num. admin. support (log), t-1			-0.02 (0.02)	-0.02 (0.02)	0.06** (0.02)	0.06** (0.02)	0.06*** (0.02)	0.06*** (0.02)	0.07*** (0.03)	0.07*** (0.03)
Num. business dev. (log), t-1			0.03 (0.02)	0.04* (0.02)	0.03† (0.02)	0.03† (0.02)	0.01 (0.02)	0.01 (0.02)	0.01 (0.02)	0.01 (0.02)
Num. design (log), t-1			0.04† (0.02)	0.04* (0.02)	-0.01 (0.02)	-0.01 (0.02)	0.05* (0.02)	0.05* (0.02)	-0.01 (0.03)	-0.02 (0.03)
Num. engineering/science (log), t-1			0.36*** (0.01)	0.36*** (0.01)	0.05*** (0.01)	0.05*** (0.01)	0.12*** (0.01)	0.12*** (0.01)	0.11*** (0.01)	0.11*** (0.01)
Num. infosys (log), t-1			-0.02 (0.02)	-0.02 (0.02)	-0.02 (0.02)	-0.02 (0.02)	0.06*** (0.02)	0.06*** (0.02)	0.07*** (0.03)	0.07*** (0.03)
Num. media/publishing (log), t-1			0.09*** (0.02)	0.07*** (0.02)	-0.02 (0.02)	-0.02 (0.02)	0.02 (0.02)	0.02 (0.02)	-0.02 (0.02)	-0.03 (0.02)
Num. operations (log), t-1			0.07*** (0.02)	0.07*** (0.02)	0.10*** (0.01)	0.10*** (0.01)	0.07*** (0.01)	0.07*** (0.01)	0.06** (0.02)	0.06** (0.02)
Num. product (log), t-1			0.09*** (0.02)	0.09*** (0.02)	0.01 (0.02)	0.01 (0.02)	0.07*** (0.02)	0.07*** (0.02)	0.03 (0.02)	0.03 (0.02)
Num. public relations (log), t-1			-0.04 (0.04)	-0.04 (0.04)	0.02 (0.03)	0.02 (0.03)	-0.04 (0.03)	-0.04 (0.03)	0.03 (0.04)	0.03 (0.04)
Num. unmatched (log), t-1			0.10*** (0.01)	0.10*** (0.01)	0.05*** (0.01)	0.05*** (0.01)	0.05*** (0.01)	0.05*** (0.01)	0.03† (0.02)	0.03 (0.02)
Percent turnover (log), t-1			0.76*** (0.04)	0.76*** (0.04)	0.2 (0.03)	0.2 (0.03)	0.10*** (0.03)	0.10*** (0.03)	0.09* (0.04)	0.09* (0.04)
Percent male (0 to 1)			-0.26*** (0.04)	-0.26*** (0.04)	-0.12*** (0.03)	-0.12*** (0.03)	-0.12*** (0.02)	-0.12*** (0.02)	-0.03 (0.04)	-0.03 (0.04)
Avg. member age			0.00 (0.00)	0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00* (0.00)	0.00** (0.00)

**Table 2.** (Continued)

	Model 1a	Model 1b	Model 2a	Model 2b	Model 3a	Model 3b	Model 4a	Model 4b	Model 5a	Model 5b
	Mktg/Sales	Mktg/Sales	Customer	Customer	Acctng	Acctng	HR	HR	Finance	Finance
	b/	b/	b/	b/	b/	b/	b/	b/	b/	b/
	robust s.e.	robust s.e.	robust s.e.	robust s.e.	robust s.e.	robust s.e.	robust s.e.	robust s.e.	robust s.e.	robust s.e.
Founding team startup experience	0.04 (0.04)	0.04 (0.04)	0.03 (0.03)	0.03 (0.03)	-0.01 (0.02)	-0.01 (0.02)	-0.03 (0.03)	-0.03 (0.03)	0.09* (0.04)	0.09* (0.04)
Founding team size	0.06*** (0.01)	0.06*** (0.01)	0.03*** (0.01)	0.03*** (0.01)	0.01 (0.01)	0.01 (0.01)	0.02** (0.01)	0.02** (0.01)	0.12*** (0.01)	0.12*** (0.01)
Num. market categories	0.01 (0.01)	0.01 (0.01)	-0.01 (0.01)	-0.01 (0.01)	0.01 (0.01)	0.01 (0.01)	0.01 (0.01)	0.01 (0.01)	0.01 (0.01)	0.01 (0.01)
Peer firm adoption of focal role	-1.57*** (0.08)	-1.57*** (0.08)	-0.37*** (0.05)	-0.37*** (0.05)	0.18*** (0.05)	0.18*** (0.05)	0.26*** (0.05)	0.27*** (0.05)	-0.02 (0.07)	-0.02 (0.07)
Constant	-0.10 (0.21)	-0.10 (0.21)	1.56*** (0.26)	1.57*** (0.26)	0.53* (0.23)	0.53* (0.23)	-0.20 (0.16)	-0.20 (0.16)	0.33 (0.50)	0.33 (0.50)
Within R <sup>2</sup>	0.51	0.51	0.50	0.50	0.44	0.44	0.45	0.45	0.39	0.39
Between R <sup>2</sup>	0.31	0.31	0.41	0.41	0.33	0.34	0.40	0.40	0.28	0.28
Overall R <sup>2</sup>	0.41	0.41	0.45	0.45	0.38	0.38	0.42	0.42	0.33	0.33
Observations	31,595	31,595	31,595	31,595	31,595	31,595	31,595	31,595	31,595	31,595

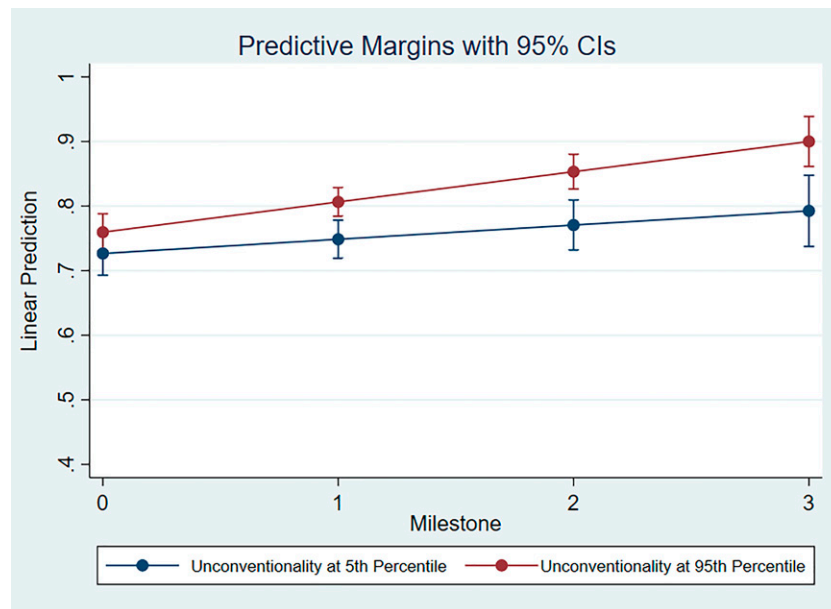
Notes. Robust standard errors in parentheses, clustered by firm. Year, founding, and regional dummies included.  
 †Significant at  $p < 0.10$  \*Significant at  $p < 0.05$ . \*\*Significant at  $p < 0.01$ . \*\*\*Significant at  $p < 0.001$ ; significance levels based on two-tailed tests.

marketing & sales, this interaction coefficient is in the predicted direction, but not significantly different from zero ( $b = 0.01$ ,  $s.e. = 0.01$ ,  $p = 0.19$ ); for customer development, however, this interaction coefficient is significantly positive ( $b = 0.02$ ,  $s.e. = 0.01$ ,  $p < 0.05$ ), consistent with Hypothesis 2. In other words, not only are unconventional firms more likely to have a more professionalized customer development function pre-funding than similar conventional firms, but the gap grows with every new developmental milestone. Overall, we find support for Hypothesis 2 in one of our two operationalizations.<sup>14</sup>

Figure 1 illustrates the growing gap in the professionalization index within the customer development function between conventional and unconventional ventures as they progress through VC fundraising milestones. Prior to completing the first milestone (e.g., raising a series A financing round), the average predicted customer professionalization index is 0.76 for ventures at the 95th percentile of unconventionality. This is similar to the average predicted customer index score of 0.73 for ventures at the fifth percentile of unconventionality as is shown by overlapping 95% confidence intervals. However, the gap between the two groups widens and becomes statistically significant ( $p < 0.05$ ) as more developmental milestones are reached. The average predicted customer index score climbs to 0.90 for ventures at the 95th percentile of unconventionality as they reach the third developmental milestone; by contrast, the average predicted customer index only rises to 0.79 for ventures at the fifth percentile of unconventionality as they reach this third milestone.

We now test Hypothesis 4, predicting the opposite effect to Hypothesis 2; that is, unconventional firms' professionalization gap relative to similar conventional firms grows as they pass a greater number of developmental milestones. The interaction coefficient between unconventionality and number of milestones is consistently negative in predicting professionalization across the internal process functions of interest: accounting ( $b = -0.03$ ,  $s.e. = 0.01$ ,  $p < 0.001$ ), HR ( $b = -0.02$ ,  $s.e. = 0.01$ ,  $p < 0.05$ ), and finance ( $b = -0.02$ ,  $s.e. = 0.01$ ,  $p < 0.10$ ). As is the case for marketing & sales, the slightly less significant support for the hypothesis for the finance function ( $p < 0.10$ ) is likely because of ceiling effects;<sup>15</sup> indeed, the finance function often receives the highest priority of all internal process functions from VCs. Overall, our results provide consistent support for Hypothesis 4.

Figure 2 illustrates how these dynamics play out for the professionalization index within the accounting function as both unconventional and conventional ventures pass through developmental milestones. Before completing their first developmental milestone, the average predicted accounting professionalization

**Figure 1.** (Color online) External Interface (Customer) Predictive Margins with 95% CIs

index score is 0.47 for ventures at the 95th percentile of unconventionality. As is reflected by overlapping 95% confidence intervals, this is similar to the average predicted accounting index score of 0.49 for ventures at the fifth percentile of unconventionality. However, Figure 2 shows that, by the time ventures reach their third development milestone, a statistically significant gap has emerged in the average predicted accounting professionalization indices of these two groups. Whereas the average predicted accounting index of each group rises, the average predicted accounting index of 0.66 for ventures at the 95th percentile of unconventionality is significantly lower ( $p < 0.05$ ) than the average predicted accounting index of 0.78 for ventures at the fifth percentile of unconventionality.

The effects of several control variables merit comment. The coefficient on the percentage of an organization's members that are male is negative and significant in predicting professionalization of all functions except finance; some of these roles tend to be more female typed than other roles (e.g., engineering). Turning to the composition of the founding team, the only founder background that is statistically significantly associated with the elaboration of the corresponding function is finance. This may reflect the fact that experienced founders are attuned to the hierarchy of investors' concerns and the importance investors place on a well-developed finance function. Finally, examining the peer adoption controls across models reveals an interesting pattern. Peer adoption is associated with higher professionalization for accounting and HR, supporting the idea that ventures

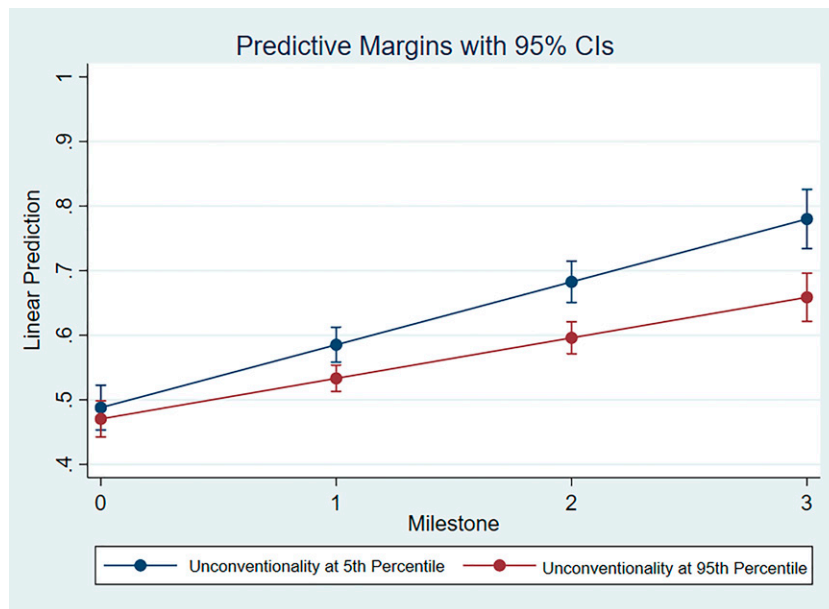
adopt some internal processes as a result of social cues and conformity pressures (Zott and Huy 2007). Surprisingly, however, peer adoption is negatively associated with the professionalization index for both external interface roles (marketing & sales and customer development). One potential explanation for this counterintuitive finding could be that, at an early stage, marketing has some features of a common good because it explains the firm's market space and educates customers (Navis and Glynn 2010, Zuzul and Edmondson 2017). If peers have expended significant resources for that purpose, the venture faces less pressure to develop these functions aggressively.

### Robustness Tests

To rule out the potential of selection bias, we evaluated the representativeness of the sample compared with the broader Crunchbase data set and commonly used VentureXpert data set (e.g., Sorenson and Stuart 2001, 2008; Pollock et al. 2015; Zhelyazkov 2018). In analyses reported in Online Table A2a, we find that the distribution of database-recorded outcomes (IPO, acquisition, or failure) for our sample is consistent with that of the broader Crunchbase data set as well as VentureXpert over a fixed time frame (2005–2010).<sup>16</sup> Furthermore, we considered the possibility of an outcome bias for unconventional firms. Outcome comparisons between the most unconventional firms and the rest of the sample presented in Online Table A2b reveal no systematic differences.

We performed several other robustness tests; detailed results from all are available in the Online

**Figure 2.** (Color online) Internal Process (Accounting) Predictive Margins with 95% CIs



Appendix. First, we considered an ordered logit specification of our models (Online Table A3). The results broadly mirror the earlier findings, but in these models, the interaction effects between the degree of market unconventionality and the number of developmental milestones completed are positive and significant in the sales and marketing model and nonsignificant in the customer development model. The ordered logit models have challenges with convergence with some role types, so we exclude the clustered robust standard errors in Online Table A3.

Second, we considered the possibility of time-related bias in individuals' self-reporting of their career histories (Online Table A4). We reran the models but omitted ventures that had been founded before 2005; this robustness test did not substantively alter our conclusions. Third, to ensure greater commensurability in the dependent variable, we evaluated an alternative dependent variable that followed a zero to two scale (Online Table A5). Here, zero was no role, one was the presence of the role outside of the top management team, and two was the presence of the role within the top management team. As with our other robustness checks, our findings were qualitatively consistent with those reported. Fourth, we reran the models excluding post-IPO firms (Online Table A6). Recall that we are already dropping ventures that are acquired or have gone bankrupt because, in either case, the company ceases to exist as an independent entity. Dropping post-IPO firms ensures that all firms are treated equivalently regardless of their outcome.

Fifth, we also confirmed the robustness of our measures to excluding the peer adoption measures for several reasons. They are conceptually close to our key mechanisms underlying unconventionality, especially at the cognitive level; including them, therefore, could render our unconventionality measures more conservative. Furthermore, the peer adoption measures are highly correlated with other controls. As shown in Online Table A7, our results are substantively unchanged if we exclude the peer adoption controls. Going even further, we examined the robustness of our findings to a naïve regression that omits all control variables and only regresses the professionalization indices against the number of milestones completed, the degree of unconventionality, and their interaction (Online Table A8). The results of these naïve regressions are consistent with all our hypotheses except that the coefficient of the main effect of the degree of unconventionality in predicting the HR index is not significantly different from zero.

Furthermore, we considered whether our use of the count of milestones completed masks more complex patterns in which firms diverge during the early milestones based on their market positioning but converge in later stages as they mature.<sup>17</sup> To perform this analysis, we replaced the count of milestones completed with two dummy variables, one representing early milestones (series A and B) and one representing later milestones (series C or later); firms with no milestones completed (i.e., preseries A) represent the omitted category. Our analyses presented in Online Table A9



suggest that in no case do we observe a convergence between conventional and unconventional ventures in their later stages; in fact, the divergence accelerates in a statistically significant fashion for later stages in the case of accounting and HR. By contrast, in the case of customer development and finance, the divergence between conventional and unconventional ventures occurs during the early milestones and then keeps steady during the later stages of development.

Finally, we explore the robustness of our results to using an alternative measure for market space unconventionality (Online Table A10) also called typicality (Lo and Kennedy 2015; also used in McDonald and Allen 2022). We computed the proximity index for each dyadic pair of categories  $l$  and  $k$  based on the number of times they appeared in a venture's categorical description:

$$P_{lk} = \frac{1}{2} \left( \frac{C_{lk}}{C_l} + \frac{C_{lk}}{C_k} \right).$$

We then calculated the typicality for each focal venture compared with others in the Crunchbase data by averaging the proximity index of each dyadic pair of categories claimed by the ventures in the data set.

$$T = \frac{\sum P_{lk}}{[N(N-1)]/2}.$$

Here,  $N$  is the number of categories claimed by the venture. In this robustness check, we dropped observations from the small number of firms that claimed to operate in only one market category. As we did with the unconventionality, we reverse coded Lo and Kennedy's (2015) typicality measure—multiplying it by  $-1$  to compute (a)typicality. Using this alternative (a)typicality measure, we broadly replicated Hypotheses 1–3 but failed to find support for Hypothesis 4.<sup>18</sup>

## Discussion

In this paper, we explore how the market positioning of new ventures is associated with the professionalization of both external interface functions and internal process functions. In particular, we highlight the divergence in the professionalization paths of young ventures with different market positioning. We argue that, for ventures occupying unconventional market spaces, the need to evangelize and educate audiences about their novel programs requires intense development and continued investment in external interface functions, resulting in their higher level of professionalization both at the venture's inception and as they scale over time. However, such efforts crowd out resources and divert managerial attention from internal process functions; furthermore, unconventional positioning also allows ventures more space to deviate from traditional internal process templates. As a result,

we predict that, relative to unconventional ventures, conventional ventures have less professionalized external facing functions and more professionalized internal process structures, both initially and increasingly so as the ventures progress through developmental milestones.

We tested these predictions using a novel longitudinal data set on the internal organizations of 3,748 U.S.-based entrepreneurial ventures. Across two different operationalizations for external interface roles (marketing & sales and customer development) and three operationalizations for internal process roles (accounting, human resources, and finance), we found consistent evidence that market positioning at inception is associated with differences in the initial professionalization of external interface and internal process roles as well as their increasing divergence as ventures pass through developmental milestones. Overall, the degree of unconventionality that a venture has staked from the very beginning is associated with two different paths: privileging external interfaces (for unconventional companies) versus privileging internal processes (for conventional companies). This finding of divergent professionalization of conventional versus unconventional ventures stands in marked contrast to the typically assumed convergent professionalization toward a common template during scaling, legitimated and promoted by external audiences, such as venture capital backers (Hellmann and Puri 2002, Maula et al. 2005). Intriguingly, this divergence appears net of organization size, supporting an emerging scholarly view that situates professionalization within broader processes of resource mobilization (Rindova et al. 2009, Fisher et al. 2016) and not merely as a by-product of organizational growth (Blau et al. 1966, Greiner 1972, Kimberly and Miles 1980).

Examining our controls, we also discovered that an increased prevalence of external interface roles among peers is *negatively* associated with a focal firm's likelihood of developing them. By contrast, an increased prevalence of internal process roles among peers has positive effects on a focal venture's likelihood of elaborating its own internal process functions. This is a counterintuitive finding that aligns with our reasoning that external interface functions can work as a common good—facilitating external coherence and increasing customer acceptance for all actors that seek to occupy a similar market space (Navis and Glynn 2010, Zuzul and Edmondson 2017). Dovetailing with research on advocacy and cultural entrepreneurship in nascent markets, one plausible interpretation of this finding is that, if a venture's peers have expended resources on external advocacy on behalf of their market space—through intense focus on marketing, sales, and customer engagement—other subsequent peer market actors may be able to ride their coattails and expend fewer resources on external engagement.

## Contributions

This paper contributes in several ways to research on entrepreneurship and new firm development as well as organizational theory more broadly. Whereas recent research brings clarity and focus to discussions of actors and processes that operate at a firm's founding (Baron et al. 1999b, Dimitriadis et al. 2017), our understanding of how the internal organizations of young firms evolve through early growth and scaling stages remains limited (Aldrich and Ruef 2006, Jin and Kirsch 2015). Predominantly, prior work examines the *modal* developmental path of young firms (DeSantola and Gulati 2017, Burton et al. 2019) and, thus, has tended to emphasize common correlates, such as size (Chandler 1962, Blau and Schoenherr 1971, Mintzberg 1979), growth (Greiner 1972), and the attainment of developmental milestones that push firms to professionalize (Hellmann and Puri 2002, Wasserman 2003). This emphasis on modal pathways, however, has come at the expense of undertheorizing key contingencies that may either accelerate or attenuate conventional determinants of professionalization. It also risks overgeneralizations about how organizations in their formative and adolescent periods evolve and behave. For example, life cycle models from the 1970s and 1980s generally presume that startups sequence the introduction of various functional roles in a relatively uniform manner at different "phases" in their life (Greiner 1972, Kimberly and Miles 1980, Galbraith 1982); our study highlights the limits of such conceptual models. Clearly, not all firms follow the same developmental rhythms as they scale up: the limited focused work examining the internal evolution of entrepreneurial ventures has uncovered evidence of the surprising persistence of heterogeneity in organizational forms set in motion at the time of founding (Baron et al. 1999b, Beckman and Burton 2008), suggesting that even assumptions about equifinality may be tenuous. In contrast to the common assumption of convergent professionalization, we advance the idea of *divergent professionalization*: that the pressures and opportunities inherent in a firm's market positioning would steer it toward a heavier emphasis on professionalizing some functions at the expense of others. Whereas a burgeoning body of research on nascent markets identifies positioning in an unconventional versus conventional market space as a key factor in shaping entrepreneurial behavior (Lee et al. 2017, Ott and Eisenhardt 2020, Zuzul and Tripsas 2020), the present study goes beyond to illustrate how such positioning is reflected in new ventures' internal organizations.

Our model of divergent professionalization also expands our understanding of the origins of heterogeneity in the degree to which entrepreneurial firms develop and elevate external and internal facing functions (see also Burton and Beckman 2007, Beckman and

Burton 2008, Ferguson et al. 2016). Functional domains, such as marketing, accounting, human resources, and finance, are a ubiquitous facet of organizational life in most modern corporations (Hayes and Abernathy 1980). Prior work, conducted in more mature organizations, predominantly begins its inquiry at a point at which these functions have already been established. Thus, it has sought to evaluate the *consequences* of variation in patterns related to these roles, such as the extent to which such roles are taken seriously and elevated to the top management team (Welbourne and Cyr 1999, Chadwick et al. 2016) or the consequences of departing executives who are dedicated to internal process or external interface roles (Bermiss and Murmann 2015). Yet the conditions under which new firms initially come to build these functions and possibly imprint them—thereby setting patterns of variation in place—remains unclear. Understanding patterns set early in an organization's life is important because such patterns often persist into later periods (Marquis and Tilcsik 2013; see Alexy et al. 2021). The present study bridges this gap, highlighting how market structures can influence the extent to which young firms build out the roles. Colloquially, debates about the origins of new venture behavior have been framed as being a question of the "jockey" (e.g., the background and personality of the firm's founders) versus the "horse" (e.g., the business idea they choose to pursue) (Eisenmann 2021). Our research highlights a key additional consideration for startup behavior: the "terrain" of the market landscape on which the jockey and horse position themselves at the gate.

A final contribution of the present paper is to bring together two overarching theoretical logics on organizational design, highlighting how they concurrently work to mold the organizational structures of young ventures. On the one side of the debate, the rich research tradition of contingency theory argues that there is no perfect organizational structure. The optimal organizational design is tied to the features of the external environment and the task-related challenges that it creates (Lawrence and Lorsch 1967, Thompson 1967). As a result, a large number of studies during contingency theory's golden age—especially the 1960s—link task environment characteristics to variations in organizational features (Burns and Stalker 1961, Simpson and Gulley 1962, Child 1972; see Raveendran et al. 2020 for a review). On the other side of the debate, institutional scholars more recently argue that organizations—even entrepreneurial ones—are pushed to mold their structures to conform to the one-size-fits-all institutionalized templates of important external stakeholders, such as venture capitalists (Zimmerman and Zeitz 2002, Sine and David 2010, Tolbert et al. 2011). Importantly, even if these templates have no task-related utility, they form an iron cage

that forces companies into conformity (in appearance if not in underlying practice) lest they lose the support of key resource providers (Meyer and Rowan 1977, DiMaggio and Powell 1983). The prevailing narrative in the new venture professionalization literature largely follows the logic of the institutionalist tradition, which highlights how the professionalization of young companies during scaling is intimately tied to pressures of resource providers, such as venture capitalists, toward a standardized set of organizational features (Hellmann and Puri 2002, Maula et al. 2005, Fisher et al. 2016). Our findings provide a synthesis of those two viewpoints. In line with the idea that institutionalized templates of how a “serious” corporation should look are transmitted and enforced by capital providers, we show that developmental milestones tied to fundraising serve as important catalysts toward professionalization. However, in keeping with the contingency logic, we show that such pressures toward professionalization manifest differently depending on the ventures’ market positioning and the unique exigencies that it creates. Unconventional companies are better able to justify the relative focus on professionalizing external interface functions and get away with deprioritizing the internal process functions relative to more conventional peers. In other words, resource providers’ general push toward professionalization predicted by institutionalists is channeled in different directions depending on the venture’s unconventionality, resulting in variation between ventures consistent with a contingency argument.

### Opportunities for Future Research

This paper opens several avenues for future research. Given the constraints of our archival data, we faced challenges in adjudicating the exact mechanisms underlying our findings that unconventional ventures have a lower propensity to build internal process roles and a greater propensity to build external interface roles as they pass developmental milestones. By conducting 30 supplemental interviews, we have endeavored to shed light on some of the mechanisms that underlie the findings we observed. Still, we see much potential here for future qualitative research to further explore these mechanisms and to distinguish between theories (see Agarwal et al. 2020). In particular, such research could explore the role that heterogeneous founder motivations and actions play (Shah et al. 2019) in shaping approaches to professionalization as ventures develop over time in both nascent and established market spaces. A related area for contributions is adopting a historicist lens and using in-depth case analysis of emerging industries to demonstrate how external interfaces and internal processes coevolved with the contemporaneous sense-

making of organizational actors as they were exploring, interpreting, and shaping industry boundaries from their unique vantage point (Kirsch et al. 2014, Wadhvani et al. 2020).

Another interesting research question arises from the tension stemming from the fact that some ventures fall behind on the professionalization of key functions even though they are expected to eventually catch up by the time they become mature corporations. In other words, the initial divergent professionalization in the earlier stages could be compensated for with accelerated convergence at some unspecified point in the future. Even as we did not find evidence of such later convergence within our sample, we cannot exclude such possibility, especially for the few ventures that eventually evolve into mature public corporations. Intuitively, eventual convergence is especially likely in the case of functions for which ventures are subject to especially strong isomorphic pressures, such as marketing and finance.<sup>19</sup> Future research can examine the existence and consequences of such accelerated catching up, such as time compression diseconomies (Dierickx and Cool 1989, Levinthal and March 1993) and ritualistic professionalization in which the company professionalizes the function for appearances without trying to create value out of it (Meyer and Rowan 1977, Westphal et al. 1997). All in all, this reinforces the importance of further study of the path-dependent nature of professionalization processes.

A third avenue for future research is exploring the performance implications of developing internal and external functions for different kinds of ventures. In other words, are the patterns of professionalization across functions adaptive or maladaptive for organizations? For example, do unconventional ventures benefit disproportionately from elaborating the marketing function relative to peers in better established markets? Conversely, are internal process functions more valuable for conventional enterprises than ones that are blazing new paths? In a tradition going back to Burns and Stalker’s (1961) work on organic organizations, and one could conjecture that path-blazing ventures in uncertain environments would benefit from being liberated from the rigidities of formal control systems, which can limit flexibility and potentially stifle the startup’s soul (see also Adler and Borys 1996, Gulati 2019). At the same time, research has found evidence that ventures may benefit from the structure that well-developed internal process functions provide (Sine et al. 2006, Davis et al. 2009). Another question that future research can tackle is the extent to which the elaboration of different kinds of functions can affect the type of successes that companies are best positioned to achieve. For example, a focus on external interfaces that helps legitimize and popularize a company in the eyes of a variety of external audiences could position it well for

outcomes such as IPOs; by contrast, effectively executing a well-trodden path using well-elaborated internal processes can be a good foundation for a strategic acquisition by an industry incumbent (e.g., see the distinction between broadcast versus focused successes by Wang et al. 2022). Future Research could further investigate these questions about the effects of elaborating different functions under varying external conditions and strategic postures.

A fourth avenue for exploration could focus more explicitly on the role of resource providers—such as venture capital and private equity backers—in the elaboration and professionalization of functions. Existing research, including the present paper, takes a more or less undifferentiated view, treating investors as a consistent force toward socially legitimate professionalized templates (Rindova et al. 2009) operationalized mostly through the passage of fundraising rounds (Hellmann and Puri 2002). It is likely, however, that significant heterogeneity exists in the pressures brought in by different investor syndicates. Some of those differences may boil down to different types of investors. For example, venture capitalists could be potentially imprinted with both their professional background and investment experience to push toward different organizational practices (Maula et al. 2005, Gaba and Meyer 2008, Pahnke et al. 2015; cf. Marquis and Tilcsik 2013). Another part of the puzzle regarding the influence of investors may lie with the cooperation and coordination dynamics within the venture capital syndicate (Gulati et al. 2012). For example, status and role asymmetries as well as the history of prior relationships can affect the nature of the interactions among VC investors (Zhelyazkov and Gulati 2016, Zhang et al. 2017, Zhang and Guler 2020, Zhelyazkov and Tatarynowicz 2021) and potentially their ability toward joint action vis-à-vis the entrepreneur (Ma et al. 2013).

## Conclusion

Despite the hold that entrepreneurial ventures have over public imagination and their importance to economic development, surprisingly little work has explored how such firms transform from fledging enterprises into professional corporations. This research constitutes an important early step in building our understanding of the conditions that influence how ventures structure their external interfaces and internal process functions as they develop over time, showing the interplay of organization and market-level forces in promoting divergent professionalization.

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## Endnotes

<sup>1</sup> In their classic paper, Hellmann and Puri (2002) measure professionalization through a blend of external interface roles, such as sales and marketing executives, and internal process activities, such as formulating human resources policies and introducing stock options plans.

<sup>2</sup> Most new ventures never achieve an IPO and the status of a publicly traded company; indeed, being acquired by a strategic investor (an established company) is the most common successful outcome. Whereas acquisitions can be lucrative for both founders and investors (Cochrane 2005), they represent the end of the company's existence as an independent entity. Furthermore, acquisition brings the new venture's professionalization journey to a close as it is absorbed into the established structures of a larger, mature acquirer.

<sup>3</sup> Hellmann and Puri (2002) blend activities associated with both types of roles in their overarching professionalization construct. Specifically, they describe marketing & sales, human resources, and finance and accounting as key functional areas associated with professionalization. Our own interviews reflect VCs' conceptualization of professionalization as being deeply intertwined with the development of functional roles associated with these areas. Emphasizing marketing & sales, a Boston-based VC commented, "I don't think [professionalization] means changing the CEO—good VCs, organizationally, think about how to grow marketing, when to spend the dollars. Planning a product release means building a marketing organization." A New York-based joiner (e.g., startup employee) emphasized how their e-retail venture began to build their human resources function "... the minute the investors asked for. When you are looking at financing, you need to start to create these [HR] documents. We created an org chart then." Finally, a New York-based VC of a bicoastal firm commented on the importance of finance and accounting: "The most contentious board meetings early on... it's oftentimes over the finances, over the numbers... - That's the first thing that we try to professionalize in the company. We want up to date metrics, we want things live, we want things real time, we want spreadsheets, we want the quarterly numbers."

<sup>4</sup> The structural and cognitive nascency of the market position a firm seeks to occupy is not simply binary, but a matter of degree. In the act of carving out an unconventional market space, some newly founded firms combine market categories that are proximate (e.g., familiar even if not always brought together), whereas others combine relatively distal market categories (Powell and Sandholtz 2012). Hence, a continuum of unconventionality is key to understanding the relative nascency of the market space in which ventures are positioned at their inception.

<sup>5</sup> We separately identified CEOs, investors, and board members, excluding the latter two affiliation types from our analysis of the internal organization.

<sup>6</sup> We also considered testing our hypotheses looking at the degree of development of operations roles. We found, however, that the use of the term "operations" was not as standardized across startups as accounting, human resources, and finance. For example, "operations" means something quite different in a manufacturing company versus the business operations role in a web company. An associate at a Boston-based VC firm commented, "Ops is so company-specific that it's hard to say what it means and who needs

that versus this.” Nevertheless, we were able to replicate our results using operations as a dependent variable, albeit with a lower  $p$ -value threshold of significance ( $p < 0.10$ ).

<sup>7</sup> We censor companies that fail or are acquired at any point in their development. In either case, obtaining subsequent professionalization data are impossible because either the company no longer exists or it is absorbed by a larger and, almost universally, fully professionalized acquirer. In our robustness tests, we explore the implications of also censoring IPO companies on the basis that doing so ensures apples-to-apples comparisons among private, pre-exit companies only.

<sup>8</sup> All key profile data, including the venture’s market categories, are submitted by verified senior members of the venture and are subject to review by Crunchbase’s own analyst team.

<sup>9</sup> Constraint can also be high if a node has few connections. However, this is not a concern given the high number of categorical overlaps in the Crunchbase database. To illustrate, the minimum number of categorical connections of any firm in our sample is 216.

<sup>10</sup> Z-score standardizing (i.e., subtracting the sample mean and dividing by the standard deviation) is important because the constraint values depend heavily on the size of the network. Because, on average, the number of active firms grows, firms that are founded later would have a lower constraint score than firms that are founded earlier. Z-score standardizing allows for a direct comparison between firms regardless of their founding date.

<sup>11</sup> Note that the effect of this multiplication procedure is simply to reverse the sign of the coefficient; the magnitude and significance of the coefficient remain unaltered.

<sup>12</sup> This is consistent with our interviews suggesting that VCs would be more likely to prioritize the development of finance roles relative to human resources or accounting roles. One commented, “Obviously we are financiers, so the financial function of the firm matters a lot to us ... So, I would say that’s the top priority of what we want to try to professionalize in a company ... In comparison to, say, HR, HR is just an afterthought ...”

<sup>13</sup> In our robustness tests, we also consider a naïve regression of the various professionalization indices versus the degree of unconventionality and number of milestones completed: see Online Table A8.

<sup>14</sup> The null interaction for marketing & sales could potentially be caused by ceiling effects. As mentioned, marketing & sales is the most professionalized of all the functions we study, and many unconventional ventures have dedicated senior roles for it from their inception. Because the initial values for marketing & sales professionalization are so high, there is naturally less space for it to increase across developmental milestones.

<sup>15</sup> Approximately 9% of our sample of pre-series A ventures have a fully professionalized finance function, and 21% have a fully professionalized marketing & sales function. The corresponding figure for any of the other functions is at around 1% at most.

<sup>16</sup> Note that, in addition to the database-recorded failures, we leveraged the resume data to allow us to infer cases of zombie companies that had ceased operating but never formally declared bankruptcy; we infer failure based on firm-years in which headcount had diminished to zero and an acquisition or other transition event had not been publicized. We list these additional closings on a row in Online Table A2a.

<sup>17</sup> We thank an anonymous reviewer for suggesting this analysis.

<sup>18</sup> We speculate that this occurs because this typicality measure focuses on average proximity of dyadic pairs of market categories, whereas our use of constraint more heavily weights the bridging properties of networks. In other words, whether ventures engage in a *bridging* act across distal market categories is more salient to how

they respond to development milestones than their average proximity to other firms in the market category space.

<sup>19</sup> For example, in our sample, by series C+, 74% of the ventures had fully professionalized marketing & sales functions and 45% of the ventures had fully professionalized finance functions. The corresponding numbers for customer development, HR, and accounting were approximately 13%, 11%, and 3%, which leaves much room for growth for the vast majority of the companies. This is consistent with Beckman and Burton’s (2008) finding of significant variation in the level of professionalization of key functions even among mature ventures.

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