

Misfit and Milestones: Structural Elaboration and Capability Reinforcement in the Evolution of Entrepreneurial Top Management Teams

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Abstract. We examine how top management team (TMT) misfit, defined as discrepancies between the TMT's functional roles and the qualifications of the managers who fill those roles, affects the evolution of TMT composition and structure in a longitudinal study of entrepreneurial ventures. We distinguish two types of misfit – overqualification and underqualification – and study how each is associated with TMT changes. We further consider the moderating effect of firm development. Results reveal that underqualified TMTs hire new managers to reinforce existing capabilities whereas overqualified TMTs elaborate their role structures. However, achieving developmental milestones (i.e., obtaining venture capital funding and staging an initial public offering) is a critical contingency to TMT change: absent these milestones, firms neither hire new managers nor add roles, even when they seemingly need to do so. These findings contribute to knowledge of how TMTs and new ventures evolve by underscoring the importance of simultaneously attending to TMT composition and structure.

Key words: top management teams, misfit, entrepreneurship, new ventures, composition, structure, roles, job creation, hiring

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The top management teams of new ventures perform a constant balancing act between fulfilling immediate needs and seizing opportunities, and they must do so in a context of constrained resources. One factor they may work to balance is the top management team (TMT) itself: specifically, matching their own skills with the formal role structure in which they work. Although researchers frequently treat TMT expertise and roles as interchangeable, recent evidence suggests that they are conceptually and empirically distinct (e.g., Beckman & Burton, 2011; Bunderson & Sutcliffe, 2002; Crossland, Zyung, Hiller, & Hambrick, 2013). TMT expertise drives strategic decisions and is a signal to important stakeholders (Beckman, Burton, & O'Reilly, 2007; Boeker, 1997). Role structures can enable coordination and help firms manage dynamic environments (Bechky, 2006; Cohen, 2013; Sine, Mitsuhashi, & Kirsch, 2006). Both are worthy of investigation independently and in conjunction.

When TMT composition and roles are not aligned, new ventures may have a need or an opportunity to change. Misalignment between TMT composition and role structure – which we label *TMT misfit* – signifies a gap between what the TMT intends to do and what it is capable of doing. A deficit of qualifications relative to the current role structure, or underqualification, reflects unmet skill requirements. An excess of qualifications relative to the role structure, or overqualification, represents opportunity. In some instances the TMT may need to augment its expertise because of weaknesses in composition; in other situations there may be an opportunity to develop and elaborate the role structure given the qualification on the team. Thus we ask: How and when do entrepreneurial TMTs adjust their people and roles in response to TMT misfit?

Two readily apparent adjustments are: 1) hiring new managers into the existing role structure to enhance team capabilities, and 2) adding new roles to recognize and allow for

fuller use of existing capabilities. We expect that TMT misfit will affect the level of both; however, these adjustments require managerial attention and financial resources that are often in short supply. Therefore, changes to TMT composition and structure likely vary with the new venture's level of development. As new ventures pass key developmental milestones such as obtaining venture capital financing or staging an initial public offering, they acquire financial-, human-, and social-capital resources (cf. Gompers & Lerner, 2001; Hellmann & Puri, 2002; Wasserman, 2003) that facilitate attracting newcomers and/or elaborating role structures. It may be that without the resources obtained through these developmental milestones, firms are unable to obtain the expertise they need or take advantage of opportunities. Thus we ask a second question: How do the patterns of response to TMT misfit vary with the level of resources available in the firm?

We examine the effects of TMT misfit on TMT composition and structure in high technology entrepreneurial firms and consider these effects in light of whether the firms have passed the developmental milestones of achieving venture capital financing and staging an initial public offering. Our findings reveal that underqualified TMTs reinforce their current expertise by hiring new managers without expanding the role structure, whereas overqualified TMTs elaborate their structure without hiring new managers. We also find that firms are more likely to respond to the needs for new expertise revealed by underqualified TMTs than to the opportunities for role elaboration provided by overqualified TMTs.

Ventures that have not achieved developmental milestones, however, make few changes to the TMT, even if they are characterized by misfit. This presents a professionalization paradox: even if a firm needs or wants to make changes that would signal their level of professionalization and so help them reach developmental milestones that bring an influx of resources (Chen, Hambrick, & Pollock, 2008; Khaire, 2010; Zott & Huy, 2007), it is unlikely to do so when it lacks the very resources it seeks to attract. In short, misfit

TMTs need to balance their own composition and structure but are constrained in their ability to do so.

Our study contributes to entrepreneurship theory by adding important nuances to arguments about the evolution of new venture TMTs. In particular, while extant literature confounds people and roles when considering the evolution of TMT characteristics, our approach not only acknowledges theoretical distinctions between team members and their roles but also empirically models the match between the two to better explain the factors that drive change. Indeed, our study reveals that assuming alignment between these characteristics is inaccurate and can mask some of the distinct processes that shape both hiring and role additions in new venture TMTs. Further, while extant research considers the role of firm development in shaping TMTs, it does so without considering how this interacts with the internal aspects of the TMT. Our study considers whether and how managers and roles in new ventures may be misfit, in conjunction with the venture's current stage of development, to provide a more complete understanding of TMT evolution and its paradoxes. Beyond contributing to entrepreneurship theory, however, highlighting TMT misfit and its effects also has implications for theories of organizational role structures, upper echelons, and misfit, and ultimately helps to answer the important question of why TMTs "look the way they do" (Hambrick, 2007; Pettigrew, 1992).

THEORY AND HYPOTHESES

New Venture TMT Evolution

The characteristics of top management teams are rarely static, and nowhere might they change more than in new ventures. For example, in the earliest days, a new venture's top management team might be comprised of a couple of college drop-outs or unemployed individuals (Dencker, Gruber, & Shah, 2009a; Dencker, Gruber, & Shah, 2009b); however, over time the firm might bring in more seasoned professional managers (Hellmann & Puri,

2002). Such compositional changes have been tied to factors such as the team's industry experience or functional diversity (Boeker & Wiltbank, 2005), new venture growth (Boeker & Karichalil, 2002), and the achievement of developmental milestones such as obtaining venture capital financing (Wasserman, 2003). Changes to TMTs in new firms may also come in the form of altering role structures (Baker & Nelson, 2005). For example, Beckman and Burton (2008) found that new venture TMTs that began with a limited set of functional positions had difficulty developing more complete role structures later on. We argue that any changes to composition and structure follow from some combination of need and opportunity for change, and that these needs and opportunities can be captured by considering the fit between the TMT's formal roles and the qualifications of the managers who fill those roles.

TMT Misfit and TMT Change

Frequently, scholars assume that the functional backgrounds of top managers and the functional roles of the TMT are brought into alignment at the time of hiring. For example, Menz (2012) suggests that TMT roles are determined *a priori* by the CEO and then filled by suitable individual executives. However, in practice, the functional backgrounds of the top managers often diverge from the functional role structure of the TMT, particularly in new ventures. Some TMTs are comprised of top managers who possess narrow functional expertise, despite holding roles that indicate a broader range of responsibility. Other TMTs could be comprised of broad generalists, with prior functional experiences above and beyond the roles they currently hold (cf. Bunderson & Sutcliffe, 2002). Both scenarios suggest that mismatches between TMT roles and people can and do occur, and we argue that these discrepancies (i.e., TMT misfit) may represent needs or opportunities for TMT change.

We define TMT misfit as *any situation in which the composite knowledge, skills, and abilities (KSAs) of top managers does not correspond to the set of roles that they occupy*. As such, TMT misfit is conceptualized at the team level, assessing the set of functional

qualifications and role requirements of the TMT as a whole. This focus on misfit at the team level is a departure from prior work in the person-environment fit literature, which primarily focuses on matches between individuals and their jobs or organizations (Chatman, 1991; Edwards, 1991; Kristof-Brown, Zimmerman, & Johnson, 2005). However, a group-level conceptualization of TMT misfit is important here because it captures overall TMT capability relative to its stated formal structure, and thus the potential for change in people and roles.

TMT misfit may occur in two directions: namely, there may be an excess or a deficit of qualifications with respect to existing TMT role structures. Again, we depart from person-environment fit literature here, which largely focuses on underqualification (Erdogan, Bauer, Peiró, & Truxillo, 2011). However, considering both TMT overqualification and TMT underqualification is important in that they represent fundamentally different problems. With TMT underqualification, stated goals cannot be met with the qualifications and associated human capital currently in the team, indicating an underlying need for change. With TMT overqualification, the TMT is currently fulfilling its formalized role requirements yet has extra qualifications. As such, the TMT could potentially achieve additional goals by fully capitalizing on the qualifications of current managers (Erdogan et al., 2011), indicating an unrealized opportunity for change.

To date research on TMT change has studied two broad phenomena: succession as an organizational response to underqualified managers (Boeker & Karichalil, 2002; Hellmann & Puri, 2002; Wasserman, 2003) and the hiring of experts into new roles (Baron, Burton, & Hannan, 1999a; Zorn, 2004). Both approaches conflate people with roles. Turnover studies treat roles as static and examine hiring and exits within established roles. Studies of new functional roles presume that these roles are filled by external hires and fail to consider the possibility that they arise as the result of reshuffling existing people. Our goal is to expand and add nuance to our understanding of entrepreneurial TMTs by carefully examining when

and how TMTs evolve in response to under- and overqualified management teams. A necessary first step is to disentangle persons and roles. Thus we examine hiring net of adding new roles, a TMT change we term *capability reinforcement*, and the addition of new roles net of hiring, a TMT change we term *structural elaboration*¹.

TMT Underqualification: A Need for Change. TMT underqualification is a deficit of functional qualification with respect to the role structure of the TMT, which results when there are too few managers with requisite capabilities currently in the firm (Cappelli, 2008; Groysberg & Lee, 2009). The most likely response to underqualification in the TMTs of new ventures is to hire new managers who have the needed skills (cf. Hambrick & Crozier, 1985). Indeed, Cappelli (2008) argues that hiring outsiders to make up the difference between current and desired skills may be an effective strategy in situations with uncertain demand and short-term needs, which is consistent with those faced by new ventures.

In contrast, creating new structural roles may not provide a viable or helpful response to underqualification in a TMT. First, adding new roles to the TMT would add to rather than reduce capability requirements. Moreover, eliminating roles from the structure, even ones that are not matched by the capabilities of team members, is unlikely in light of what we know about organizational inertia and may have broader negative implications. For example, suppose four engineers start a new venture yet in doing so take on broad TMT roles (e.g., those including general management, business development, etc.). Altering the role structure to reflect their current capabilities may threaten their legitimacy by signalling low TMT quality to potential investors. Functional breadth in TMT role structures speeds the process of staging an initial public offering (Beckman & Burton, 2008) and heterogeneity in expertise is

¹ Although turnover studies sometimes combine TMT hires and exits for an overall measure of compositional change (e.g., Boeker & Wiltbank, 2005), here we focus on hiring because it has a strong association with new venture growth (Eisenhardt & Schoonhoven, 1990; Gilbert, McDougall, & Audretsch, 2006) and is more within the control of the TMT itself. However, we control for managerial exit in our empirical models; this allows us to capture hiring that increases the skill capabilities of the TMT beyond the hiring that may occur to fill vacancies, for example.

valued by venture capitalists (Franke, Gruber, Harhoff, & Henkel, 2008), both of which argue against altering role structures to reflect actual versus intended capability when a TMT is more narrowly qualified than its stated roles. In such instances we suspect that team members will take additional time to “grow into” their roles, perhaps through on-the-job experience or training (Bidwell & Briscoe, 2010; Hersch, 1995), while minimizing changes to the current role structure. Indeed, they may even divert resources from the activities associated with role additions so they can focus on developing and making use of the somewhat limited skills in the team. In short, TMT underqualification should result in capability reinforcement through the hiring of new managers but not structural elaboration through the formation of new roles.

Hypothesis 1. TMT underqualification will positively predict TMT hiring.

Hypothesis 2. TMT underqualification will negatively predict new TMT roles.

TMT Overqualification: An Opportunity for Change. TMT overqualification is an excess of functional qualifications with respect to the role structures that exist within the TMT. Such TMTs do not need to change their composition as they are already fulfilling the goals implied by their formal role structure; yet their excess qualifications present opportunities that could be capitalized on with the current team. As such, we suspect that any changes to these TMTs will come in the form of adding new roles to the structure to reflect this unutilized expertise (Miner & Estler, 1985) rather than hiring newcomers. Adding new roles enables the TMT to more accurately signal the capability that exists within the team, which may be important as the new venture TMT attempts to attract investors (cf. Franke et al., 2008) or as it makes preparations for an initial public offering (Chen et al., 2008). In addition, new roles can confer status and recognition (Baron & Bielby, 1986; Baron & Pfeffer, 1994), which may induce overqualified managers to stay with a young firm.

At the same time, we expect levels of TMT hiring to be lower when levels of TMT overqualification are higher. Consistent with this argument, Boeker and Wiltbank (2005)

found that there was less hiring and exit in new venture TMTs that were more functionally diverse—a phenomenon highly correlated with having more skills in the team—even in the face of expansion. Similarly, evidence has shown that entrepreneurial ventures with greater functional breadth in their top management teams bring in fewer new employees (Dencker et al., 2009a). Therefore, TMT overqualification should result in structural elaboration through the addition of new TMT roles but not capability reinforcement through hiring.

Hypothesis 3. TMT overqualification will negatively predict TMT hiring.

Hypothesis 4. TMT overqualification will positively predict new TMT roles.

The Moderating Effects of Firm Development

Thus far we have argued that the gaps that result from TMT misfit reveal needs or opportunities that contribute to the evolution of TMTs in new ventures, without considering what resources are available to make these changes. An important contingency factor that may affect the relationship between TMT misfit and TMT change, therefore, may be a new firm's stage of development, as indicated by whether it has achieved developmental milestones such as receiving venture capital financing or staging an initial public offering (e.g., Boeker & Karichalil, 2002; Chen et al., 2008; Gompers & Lerner, 2001; Hellmann & Puri, 2002; Rubenson & Gupta, 1996; Wasserman, 2003, 2006). Each of these milestones provides resources that facilitate hiring and adding roles, such as knowledge about how to structure roles and attract experienced top managers, the ability to recruit these managers, and the financial means to do so. For example, venture capitalists not only provide capital investments in new firms but also help recruit senior managers through their professional contacts (Bygrave & Timmons, 1992). While these resources may facilitate overall hiring and role additions, they may also intervene in the relationship between misfit and TMT changes. Therefore, the effects of TMT misfit on TMT hiring and role additions should be considered with respect to the firm's level of development (see Figure 1).

Insert Figure 1 about here

We predicted that TMT underqualification would result in capability reinforcement through increased hiring but not structural elaboration through the addition of new roles. Some executive hiring may occur even before developmental milestones bring increased resources. For example, to help attract venture capital financing, teams may hire newcomers to ensure they have extensive industry experience and diversity in educational backgrounds (Franke et al., 2008). New venture TMTs also go to great lengths to ensure that they attract prestigious executives and directors in the year prior to an initial public offering (Chen et al., 2008). However, because hiring new managers often requires significant resources both in terms of financial costs and in terms of tapping into social networks to recruit qualified candidates, we expect that the positive effect of TMT underqualification on hiring should be even stronger with higher levels of firm development.

We also predicted that TMT underqualification would negatively affect new TMT roles because adding new roles does not solve the problems that underqualification presents. In fact, this response would likely add to rather than reduce capability requirements if new roles were added, whereas narrowing the role structure to reflect existing capabilities may send negative signals to potential stakeholders. Although achieving developmental milestones might provide knowledge and financial resources that could give new firms more flexibility to address mismatches by changing their structures, it does little to resolve these concerns about capabilities and legitimacy. Indeed, legitimacy continues to be a concern for both the TMT and its investors in firms that have passed such milestones (cf. Guler, 2007; Zimmerman & Zeitz, 2002). Therefore, we expect that the relationship between TMT underqualification and the number of new roles created is unlikely to change even after

reaching developmental milestones. In short, the achievement of developmental milestones will moderate the effect of TMT underqualification on hiring, but not that of TMT underqualification on new TMT roles.

Hypothesis 5. The positive effect of TMT underqualification on TMT hiring will depend on firm development, such that the effect will be stronger with greater development.

Recall that in situations of TMT overqualification we expect to see an increase of new TMT roles and a decrease of new TMT hires. Overqualified TMTs may want to add roles to capitalize on opportunities created by overqualification but doing so can be a significant and costly undertaking (Stinchcombe, 1965), requiring managerial time, expertise, and coordination (Sine et al., 2006). Overqualified TMTs will have some surplus capabilities that might be applied to developing new roles; however, the resources gained by achieving developmental milestones can further facilitate role additions. The influx of cash and expertise may afford managers more time and financial resources to make adjustments in the structure, and investors themselves may provide expert coaching (cf. Baum & Silverman, 2004; Hellmann, 2000) to help them more appropriately signal their quality through improving and developing the role structure. Thus, the positive effect of TMT overqualification on new roles should be even stronger at higher levels of firm development.

We also argued that TMT overqualification would dampen hiring since the qualifications of current TMT members already fulfil stated goals and anticipated needs could potentially be filled with these existing surplus capabilities. Overqualification creates neither a need nor an opportunity to hire, and thus the effect of TMT overqualification on hiring should be independent of the increased resources associated with achieving developmental milestones. So while the resources that come with achieving developmental milestones may themselves result in greater hiring (Davila, Foster, & Gupta, 2003), these

additional resources would be unrelated to the effect of TMT overqualification on hiring. In sum, we expect that the achievement of developmental milestones will moderate the effect of TMT overqualification on new TMT roles, but not that of TMT overqualification on hiring.

Hypothesis 6. The positive effect of TMT overqualification on new TMT roles will depend on firm development, such that the effect will be stronger with greater development.

METHODS

Data and Sample

We test these ideas by examining a sample of 167 high-technology entrepreneurial firms in a single region that have been studied previously (Baron, Hannan, & Burton, 1999b; Baron, Hannan, & Burton, 2001; Burton, Sørensen, & Beckman, 2002). Previous studies collected TMT data on these firms and examined important elements of entrepreneurship theory, such as team factors that lead to venture capital financing or initial public offering (Beckman & Burton, 2008; Beckman et al., 2007) and factors that result in different strategic choices (Beckman, 2006). The current study is designed to examine the evolution of the people and role structures that comprise the TMT in these entrepreneurial firms. Building from past studies that document path dependence in TMT composition and structure (Beckman & Burton, 2008) and position imprinting of individual roles (Burton & Beckman, 2007), the current study is an attempt to better understand the mechanisms of imprinting and path dependence at the team level. We extend ideas from the fit literature and consider how types of misfit between all TMT roles and the people that occupy those roles drive subsequent changes to TMT composition and structure.

The firms in the sample were less than 10 years old and had fewer than 10 employees when they were initially contacted. This database contains rich information about the roles in the top management team and the managers who occupy them, as well as information about

the developmental milestones achieved by each firm (e.g., dates of venture capital funding and initial public offering). Information about the roles and managers included in the top management teams was gathered via interviews, internal company documents, public archives, and extensive Web searches. As described in Burton and Beckman (2007), the research team tracked the career histories, start dates, initial job titles, job title changes, and departure dates of each executive who ever held a top management team position of Vice President or higher in one of the sampled firms from firm founding to December 2000 or until acquisition or failure. The database contains information on 1,452 executives holding 1,918 top management team roles.

Measures

Independent Variables. Based on our conceptualization of TMT misfit, we needed a measure that could: 1) assess misfit across the entire management team rather than as an aggregation of individual-level misfit, 2) capture both overqualification and underqualification instead of one combined measure, and 3) be assessed on a set of objective qualifications that could be observed in both roles and managers. TMT misfit was calculated by comparing the number of times each functional area was listed in any job title for the entire top team with the total number of managers with experience in those functional areas.

First, both current job titles and the career histories of top managers at the hierarchical level of Vice President or above were classified according to 11 different functional areas: sales, marketing, customer support, operations, finance, administration, human resources, strategic planning/business development, science/engineering, information systems, and general management (Burton & Beckman, 2007). For example, one of the TMTs in our sample included the following job titles (and functional classifications): President/Chief Executive Officer (general management), Vice President Engineering (science/engineering), Vice President International Operations (operations), Chief Financial Officer (finance), Vice

President Manufacturing (operations), and Vice President Marketing (marketing). This team thus had one general management role, one science/engineering role, one finance role, one marketing role, and two operations roles.

Next, the career histories of the top managers were also classified according to these 11 functional areas. Executives were considered to have experience in these areas if they had titles that included these functions in any of their previous three jobs. One manager in our sample was recruited from a competitor to replace the VP of Marketing. The new hire had served for four years first as Strategic Marketing Manager and later as Marketing Director for a business unit. His prior position had been Systems Engineer at a different firm. We would code this person as having prior experience in both marketing and engineering.

Using these data, we then calculated the amount of overqualification or underqualification relative to the current role structure at the team level. *TMT overqualification* is a count of the prior experiences above that required by the current roles of the team across all 11 functions. For example, if there are three top managers who have operations experience but only two current job titles that indicate an operations functional role (e.g., the VP of International Operations and the VP of Manufacturing in the sample TMT described above), the TMT would have an overqualification score of one for the operations function. Overqualification was then summed across all 11 functional areas to give an overall measure of how much more experience the group of top managers' had relative to the current roles listed for the team (mean = 2.45, s. d. = 2.27, range = 0 to 18).

TMT underqualification is a count of the roles listed for the TMT that include functional areas for which the group of top managers lack prior experience. For instance, a firm that has three roles with marketing listed in its TMT titles but only two top managers with marketing experience would have an underqualification score of one for the marketing function. Underqualification was summed across the 11 functions to indicate how much the

group of top managers lacked experience relative to the current roles listed for the TMT (mean = 0.47, s. d. = 0.92, range = 0 to 9). On average, TMTs had managers with experience in 1.84 functions (s. d. = 0.90) while the roles in the team required capabilities in 1.24 functions (s. d. = 0.48). When aggregated across all positions, this produced a higher level of overqualification than underqualification.

After executives held their current roles for one year, a long enough time frame to learn from on-the-job experience (National Center for O*NET Development, 2011), they were considered to have experience in that function (i.e., had they not otherwise had prior experience in their career history). Other specifications of the extent to which executives learn on-the-job were examined as robustness checks. Finally, we lagged the TMT misfit variables by 12 months, $t - 12$, in order to allow the effects of overqualification and underqualification on changes to TMT composition and structure to be realized within the firms over the following year.

Both the TMT overqualification and TMT underqualification measures assess the fit between the work deemed important by the TMT (e.g., as listed by TMT roles) and the ability of the team to carry out that work (e.g., as assessed by the total amount of prior functional experiences across all top managers in those roles). The assumption of this measure is that the prior functional experience of one manager may be helpful to another manager who holds a different role. However, it is possible that top managers may not use their skills to fill in voids in other areas within the TMT. Therefore, we constructed an alternative measure of TMT misfit as a robustness check. For this alternative measure, we considered the match between current job title and prior functional experience for each individual manager before aggregating these scores to the team level as in an additive composition model (Chan, 1998). For example, in our sample TMT described above, there may be one individual who has experience beyond that required by his or her role (e.g., the Chief Operating Officer has

experience in both general management and marketing) and one individual who lacks experience required by his or her role (e.g., the VP of Marketing has business development experience but not marketing experience). Assuming all other individuals on the TMT have experience commensurate with their roles, this TMT would have an overqualification score of one (i.e., the COO) and an underqualification score of one (i.e., VP Marketing). Thus, unlike the team-level measure in which the COO's marketing experience would 'count' for the role of VP Marketing, this measure considers the underqualification of the VP of Marketing without respect to the prior functional experience of any other member of the team. These measures are slightly larger in magnitude for both types of misfit, and assume that individuals' experiences are not utilized beyond their specific roles. We report the results using this measure in the robustness checks section for comparison purposes.

Next, we assessed *firm development* by examining whether a firm had received venture capital funding or staged an initial public offering. Both of these events are considered to be important developmental milestones (e.g., Boeker & Karichalil, 2002; Chen et al., 2008; Hellmann & Puri, 2002; Rubenson & Gupta, 1996; Wasserman, 2003) and each represents the receipt of additional resources that are brought into the new venture, in terms of financial capital and expertise (Gompers & Lerner, 2001; Hellmann & Puri, 2002; Wasserman, 2003). Therefore, we dummy coded the firm's achievement of each of these two milestones at time t , and then summed across events to create an overall measure of level of firm development. This variable ranged from 0, in which a firm had no venture capital funding and no initial public offering, to 2, in which a firm had received venture capital funding and had staged an initial public offering. In our sample, 71 percent of the firms received venture capital funding and 53 percent went public. These numbers are high relative to start-ups in the general population of start-ups, but our sample consists of high-technology firms in the 1990s, a period of incredible growth for entrepreneurial companies in the US.

Dependent Variables. Changes to the TMT in response to the needs or opportunities reflected in TMT misfit could come in the form of hiring new managers and/or adding new structural roles. Hiring new managers expands the TMT in terms of numbers of managers and, more importantly for our arguments, in terms of capabilities. Since hiring may also occur as new roles are created, we examine the hiring of new managers into the TMT while holding the TMT structure constant. The second type of change, adding new roles, is an elaboration of structure. New roles involve the addition of distinct tasks not previously identified in the role structure. We are particularly interested in the phenomenon of broadening the role structure within which current managers operate. For example, a current manager may take on a new role of VP Business Development, which had never before existed in the firm, and his or her previous role (e.g., VP Sales and Marketing) might be filled by another manager, altogether eliminated, or split into roles for other managers. Since new roles could also be filled by hiring new managers (e.g., a newcomer takes on a new role of VP Business Development) (cf. Levesque, 2005; Miner, 1987), we examine the addition of new roles to the TMT holding TMT hiring constant.

First, we calculated *TMT hiring* as the sum of all top managers who appeared in month t but who were not employed by the firm in month $t - 1$. This dependent variable is comprised of the number of hires in the TMT over a one-year period; that is, TMT hiring measured at time t is the sum of the new hires within the TMT over the subsequent twelve months ($t + 12$). However, this variable is updated each month to reflect hiring at different times in the prior year. This allowed us to capture hiring in a fine-grained way, such that the misfit variables are predicting 12 months of hiring exactly one year after assessing TMT misfit. In contrast, yearly analysis could introduce greater variability in these time spans, for example examining misfit that occurred in January of one year with hiring that occurred in November of the following year, even though the time span is greater than 12 months.

Monthly updating thus captures the dynamic changes through hiring observed in these firms within the twelve month period for which they are counted and allows us to be more precise with respect to the time spans between independent and dependent variables.

Next, we assessed *new TMT roles* as being added when a job title appeared that had never before existed in the firm (see Cohen & Broschak, 2013). For example, the addition of a VP Sales title that had never before existed would be counted as a new TMT role. However, if the firm later added titles such as Executive VP Sales, VP of North American Sales, or VP Sales and Marketing, these would not be considered to be new TMT roles as they are variations on a previously existing role. In addition, splitting an existing role (e.g., splitting a previously existing role of VP Sales and Marketing into VP Sales and VP Marketing) would not be considered a new role in our terminology as the need for the functional expertise had already been formally articulated. None of the titles that existed during the founding month of the firm were coded as new, since prior to that date the firm did not exist. Finally, we did not include “Founder” as a job title in our coding scheme since this title does not imply a structural role or responsibility within the TMT; rather, it indicates an individual’s status or past history with the firm. The first author coded the job titles that existed within the firms based on the above coding scheme. A second coder applied the coding scheme to half of the dataset in order to verify that the coding scheme was applied consistently and reliably. Agreement between the two coders was acceptable (Cohen’s Kappa = .87), so we were confident in using this coding scheme to assess new TMT roles. There were 1,918 job titles in the dataset, of which 40 percent were considered new roles in that no portion of the job title existed in the prior periods. Like TMT hiring, *new TMT roles* were counted over a one year period for the analysis but updated monthly to reflect the fine-grained changes in TMT structure that occurred over that period.

Control Variables. We controlled for *industry* to account for potential differences in opportunity structures for firms within particular industries. For example, manufacturing has lower turnover rates than high technology firms in general (Burton & Beckman, 2007) and may also experience more stability in roles. In our analyses, we find that different industries matter for TMT hires and role additions so we include five dummy variables to account for variations among firms in all six industries. *Firm age* has been shown to relate to role structure (Baron et al., 1999a), so we controlled for firm age as measured by the number of months since founding. Firm age was lagged by 12 months to match our misfit variables.

Size can affect potential for growth via new hires and proliferation of new job titles (Baron & Bielby, 1986; Strang & Baron, 1990), and *team size* may be particularly relevant for entrepreneurial firms (Burton & Beckman, 2007; Eisenhardt & Schoonhoven, 1990). Therefore, we control for team size as the number of executives in the top management team. Evidence suggests that it is important to control for *organizational tenure* (Cohen & Broschak, 2013), which we measured as both the mean tenure among a firm's top management team and the standard deviation of tenure among top managers. Finally, because the level of functional diversity in a team may also influence whether positions or people are altered, we controlled for the *functional diversity of the team* by calculating Blau's (1977) index for functional diversity for the executives' three most recent job titles. Team size, average tenure and tenure dispersion, and functional diversity were also lagged by 12 months.

Next, we controlled for *TMT exits*, which could affect the amount of hiring and the addition of new roles in the current structure, by calculating the total number of top managers who were employed by the firm in month $t - 1$ but not employed by the firm in month t . Similar to the dependent variables described above, exits were considered over a one year period for the analysis but updated monthly to reflect the dynamic changes occurring in the composition of the TMT over that period.

Finally, in order to capture distinct changes to the TMT in terms of hiring or roles, it is necessary to control for the other potential dependent variable when estimating the effects of misfit on either of the changes to the TMT. For example, we have argued that TMT overqualification should result in the elaboration of structure through addition of new TMT roles for existing top managers. Any role changes should be over and above those that occur when hiring newcomers to fill new roles. Thus when estimating the effects of TMT misfit on new TMT roles it is essential to control for TMT hiring in the same period. Similarly, we control for new TMT roles when estimating the effects of TMT misfit on TMT hiring, which captures the reinforcement of capabilities while keeping the role structure constant.

RESULTS

Descriptive statistics and correlations among study variables are presented in Table 1. Of note is the high amount of overqualification (mean = 2.45, s. d. = 2.27) relative to underqualification (mean = 0.47, s. d. = 0.92) in these teams. Moreover, there is a small positive correlation between over- and underqualification ($r = .05$), which indicates that these are independent types of misfit. Given relatively high correlations between some of our independent variables and control variables (e.g., TMT overqualification and functional diversity), we checked for the possibility of multicollinearity. First, we analyzed variance inflation factors, which revealed that no variables had scores higher than 10 (the highest score was 4.17) (Hair, Anderson, Tatham, & Black, 1995; Neter, Wasserman, & Kutner, 1996). Next, we ran our models without each of the control variables that had high correlations with the independent variables (e.g., functional diversity, team size) and the exclusion of these controls yielded results consistent with those presented below. Not surprisingly, TMT hiring and new TMT roles are highly correlated because hiring often occurs with the addition of new roles. Again, our focus here is on capability reinforcement through TMT hiring while controlling for structural elaboration through adding new roles and vice versa.

Insert Table 1 about here

To estimate the effects of TMT misfit on composition and structure, we performed monthly panel-Poisson random effects regression analyses predicting counts of the number of new TMT hires and new TMT roles with estimates grouped by firm (see Table 2). Poisson models are superior to ordinary least squares regression when estimating count data because the distribution of the data is typically skewed (Allison, 2009), and are a standard approach for analyzing panel count data in particular (Somaya, Williamson, & Lorinkova, 2008).

Insert Table 2 about here

Hypothesis 1 and 2 suggested that TMT underqualification would positively predict new TMT hires and negatively predict new TMT roles. Models 1 and 4 are our baseline models with only control variables. Models 2 and 5 add the main effects of TMT underqualification on new TMT hires and roles, revealing that TMT underqualification positively predicts the number of hires and negatively predicts adding roles, supporting these hypotheses. The practical significance of these findings is illuminated by the incident rate ratios from these models, which suggest that for every unit increase in TMT underqualification there is a 7 percent increase in the incident rate of the number of new TMT hires and a 12 percent decrease in the incident rate of the number of new TMT roles. Considering these effects over time, an average firm, with the mean level of TMT underqualification, takes approximately 2.6 years to hire a newcomer and approximately 1.9 years to add an additional role. In contrast, firms with high levels of TMT underqualification

(i.e., two standard deviations above the mean) hire a newcomer about 4 months sooner but wait about 6 months longer to add a new role.

Hypotheses 3 and 4 suggested that TMT overqualification would negatively predict TMT hiring and positively predict new TMT roles. Models 2 and 5 show the main effects for TMT overqualification on new TMT hires and roles, revealing that TMT overqualification negatively predicts the number of hires and positively predicts adding roles, supporting both hypotheses. Note that the coefficients for TMT overqualification predicting hires and roles are smaller than those of TMT underqualification, a point we explore further with our robustness checks. Practically, for every unit increase in TMT overqualification there is a 3 percent decrease in the incident rate of the number of new TMT hires and a 3 percent increase in the incident rate of the number of new TMT roles. Considering these effects over time, an average firm, with the mean level of TMT overqualification, takes approximately 2.6 years to hire a newcomer and approximately 1.9 years to add an additional role. In contrast, firms with high levels of TMT overqualification wait about 5 months longer to hire a newcomer but add a new role about 3 months sooner.

Hypothesis 5 suggested that firm development moderates the effect of TMT underqualification on TMT hiring. Model 3 shows that the coefficient on this interaction term is positive, indicating that the slope of the effect of TMT underqualification on the number of new TMT hires becomes more positive as firm development increases. Figure 2 shows the effect of TMT underqualification on the expected number of new TMT hires for each number of developmental milestones the firm has achieved. Using a procedure described by Dawson (2014) to evaluate simple slopes for interactions with nonlinear models, we discovered that when firms have not achieved any developmental milestones, the effect of TMT underqualification on new TMT hires is negative ($b = -.07, p = .00$). When the number of

milestones equals one or two, the effect is positive ($b = .04, p = .00$; $b = .15, p = .00$). This supports Hypothesis 5.

 Insert Figure 2 about here

Practically, the expected number of new TMT hires increases with greater TMT underqualification and the achievement of more milestones, and when firms have not achieved any milestones they are *not* likely to hire as a result of underqualification. This latter effect suggests that the support for Hypothesis 1 is driven by those firms that have reached developmental milestones. For example, at mean levels of TMT underqualification, new ventures that have not achieved any milestones are expected to hire a newcomer in approximately 3.1 years whereas new ventures that have achieved two developmental milestones hire about 9 months sooner. At high levels of TMT underqualification (i.e., two standard deviations above the mean), new ventures that have not achieved any milestones are expected to hire a newcomer in approximately 3.6 years whereas new ventures that have achieved two milestones hire about 1.8 years sooner.

Hypothesis 6 suggested that firm development moderates the relationship between TMT overqualification and new TMT roles. Model 6 reveals that the coefficient on the interaction term is positive and significant, indicating that the slope of the effect of TMT overqualification on the number of new roles becomes more positive as firms pass more developmental milestones. Figure 3 shows the effects of TMT overqualification on the expected number of new TMT roles added for each number of developmental milestones achieved. Simple slope analysis shows that the relationship between TMT overqualification and new TMT roles is negative when the number of developmental milestones equals zero ($b = -.02, p = .00$). However, this relationship is not significant when the firm has achieved one

developmental milestone ($b = .01, p = .28$). Further, this relationship is positive when the firm has achieved two developmental milestones ($b = .04, p = .00$). These results are consistent with Hypothesis 6.

 Insert Figure 3 about here

Practically, the expected number of new TMT roles increases with greater TMT overqualification and the achievement of both venture capital financing and initial public offering, and when firms have not achieved either of these milestones they are *not* likely to create new roles as a result of overqualification. This latter effect suggests that the support for Hypothesis 4 is driven by those firms that have reached developmental milestones. For example, at mean levels of TMT overqualification, new ventures that have not achieved any milestones are expected to add a new TMT role in approximately 4.4 years whereas new ventures that have achieved two developmental milestones add a new role about 10 months sooner. At high levels of TMT overqualification, new ventures that have not achieved any milestones are expected to add a new TMT role in 4.8 years whereas new ventures that have achieved two developmental milestones add a new role about 1.8 years sooner.

Robustness Checks

We performed a number of additional analyses to verify the robustness of our results. First, to understand how long misfit affects our outcomes, we tested alternative lag structures for the TMT misfit and control variables: an 18-month lag for TMT misfit, to predict changes to TMT hiring and roles in the following 18 months, and a 24-month lag for TMT misfit, predicting changes to TMT hiring and roles over the following 24 months. Our results remain consistent with these lags, with two exceptions. First, when we adopt the 18-month lag structure, the interaction effect of TMT overqualification and firm development on new TMT

roles in Model 6 is not significant ($b = -.01, p = .19$) Second, when we adopt either of these longer lag structures, the positive main effect of TMT overqualification on new TMT roles in Model 5 is no longer significant. Again, however, this main effect is qualified by the significant interaction between TMT overqualification and firm development on the number of new TMT roles in the 24-month lag model, which is consistent with our results as currently presented.

To consider the possibility that some hiring and role additions may be created in anticipation of an upcoming milestone, as “window dressing”, we also adopted a different event window with respect to our firm development variable. Specifically, we created a variable called “milestone anticipation” that equalled one for the 12-month period prior to the receipt of venture capital financing or initial public offering (i.e., the 12-month period prior to the point at which our firm development variable became one instead of zero). We found that this variable was negatively related to hiring ($\beta = -.20, p = .01$) and new TMT roles ($\beta = -.26, p = .00$), indicating that firms were less likely to hire or add roles in the year prior to achieving a developmental milestone than at other times. Moreover, including the milestone anticipation variable along with the firm development variable in our current models did not change any of the signs or significance levels for the hypothesized results reported in Table 2. This suggests that while firms may engage in other forms of window dressing in anticipation of a financing event - e.g., adding executives or directors with specific prestige (Chen et al., 2008), they do not substantially alter the roles or composition of the TMT more generally. This is consistent with our finding that firms need resources to make changes to the TMT.

Second, we considered several alternative specifications of our TMT misfit variables. Because misfit is not typically conceptualized at a collective team level, we first considered an alternative measure which treated misfit as position-specific to account for the idea that the excess qualifications of one manager may not benefit those in another role. The pattern of

results was identical with respect to the signs and significance levels of the coefficients for our predictor variables. We also considered the possibility that on-the-job training for executives might take longer than one year when updating the functional experience calculations for our misfit variables. Therefore, we adopted a three-year on-the-job training rule of thumb (cf. Conger & Nadler, 2012), which resulted in similar results with the exception that the interaction between TMT overqualification and firm development on new TMT roles becomes insignificant ($b = .01, p = .49$). Finally, we considered the possibility that calculating functional experience based on the past three positions may overemphasize distant past experience. As such, we calculated functional experience using three alternatives: the most recent position only, the past three executive-level positions (versus including experience gained in non-executive positions), and the most recent executive-level position only. Across all of the models using the TMT misfit variables calculated under these alternative assumptions, we find that the signs and significance levels of the coefficients for our predictor variables remain unchanged from those presented in Table 2.

Next, we ran Models 3 and 6 with the addition of the interaction terms that we did not hypothesize *a priori*. Specifically, we included the interaction between TMT overqualification and firm development when predicting new TMT hires and the interaction between TMT underqualification and firm development when predicting new TMT roles. Neither of these interactions was statistically significant, and their inclusion in the models did not change the sign or significance levels of the hypothesized effects.

Finally, we examined two alternative model specifications. First, we estimated fixed effects Panel-Poisson models to further take into account time-invariant characteristics of firms. The results are consistent with the random effects models presented in Table 2, both in terms of the signs and significance levels of the coefficients of the predictor variables. Second, we considered the possibility of excess zeros in the dependent variables. Because we

have panel data, we could not use zero-inflated Poisson. Instead, we ran two-stage Poisson random effect hurdle models to predict the excess zeros and then the count of new TMT roles and hires (cf. Min & Agresti, 2005). First, we recoded these dependent variables into dummy variables and ran a Panel-Logit model to simulate running the first part of a zero-inflated Poisson inflate model. Next, we ran Panel-Poisson models for the counts of the dependent variables when they were equal to one or above. After taking into account the excess zeros in the Panel-Logit model, the Panel-Poisson count models for dependent variables at one or above were largely consistent with the Panel-Poisson count models that include zero counts reported in Table 2. For example, they showed that TMT overqualification negatively predicts the number of new TMT hires (at $p = .06$) and TMT underqualification positively predicts the number of new TMTs hires, although the latter main effect continues to be qualified by a positive interaction term for TMT underqualification and firm development. In addition, TMT overqualification positively predicts the number of new TMT roles (at $p = .05$) and TMT underqualification negatively predicts the number of new TMT roles. However, the interaction term between TMT overqualification and firm development is no longer significant, which is inconsistent with Hypothesis 6.

In summary, these alternative models indicate that our results are generally robust across a variety of model specifications, variable operationalizations, and variable lag structures. The exception is the interactive effect of TMT overqualification and firm development on new TMT roles, which was not supported in three robustness checks. Moreover, the coefficients of TMT overqualification were smaller than those of TMT underqualification. One explanation for these results is that the opportunity afforded by overqualification is less of a driver of change than the need indicated by underqualification. To explore this empirically, we performed dominance analysis using the *domin* package in Stata (Luchman, 2013), which examines the relative importance of two predictor variables

for every possible subset of the full model in which only one of the two predictors is entered (Azen & Budescu, 2003). The general and conditional dominance statistics showed that TMT underqualification reduced the AIC fit statistic by a greater amount than did TMT overqualification, suggesting it is the more critical predictor of TMT changes.

DISCUSSION

We began this paper by noting the balancing act that new venture TMTs perform between fulfilling immediate needs and capitalizing on opportunities in a context in which resources are in short supply, and we examined this balancing act for the composition and structure of the TMT itself. We theorized that TMT misfit, defined as discrepancies between the qualifications of TMT managers and the functional roles they fill, would influence hiring and the addition of new roles to the TMT, and that these relationships may be contingent upon the resources new firms gain by achieving developmental milestones.

We found that TMT misfit in the form of underqualification resulted in increased hiring of newcomers but not the addition of roles, whereas TMT misfit in the form of overqualification resulted in the addition of roles but not increased hiring of newcomers. However, firm development was an important determinant of whether TMT misfit resulted in such changes at all. Prior to achieving developmental milestones, firms made few TMT changes in response to misfit. Only after passing developmental milestones did overqualified TMTs elaborate their structures by adding new roles and underqualified TMTs reinforce their capabilities by hiring new people.

We also found that TMT underqualification was a more robust predictor of TMT change than TMT overqualification. TMT underqualification occurs when a team has fewer capabilities than those identified in the formal role structure, and as such, represents an underlying need to add skills to achieve its implied goals. Teams characterized by overqualification, in contrast, are currently fulfilling the implied goals of their role structure

and have excess capabilities. These teams do not have an underlying need, but rather an opportunity to better recognize and profit from the capabilities of their members. As such, the effects of TMT misfit appear to be asymmetrical: the need presented by underqualification may trump the opportunity presented by overqualification when predicting TMT evolution.

These findings contribute to theories of entrepreneurial firms in several ways. First, by modelling the misfit between TMT composition and structure in new ventures, we demonstrate that it is insufficient and possibly misleading to treat composition and structure as interchangeable or to look at one independently of the other. While a small set of studies has examined the effects of one or the other in explaining new venture TMT evolution, ours is the first to consider TMT misfit, the intersection of the two, in explaining how new venture TMTs evolve.

Second, in examining this interplay between misfit and new venture development, we reveal an important professionalization paradox in the evolution of new venture TMTs: firms seem unable to reach the level of professionalization needed to attract resources without first having obtained those resources. Specifically, new venture TMTs often experience mismatches between the composite experiences of their top managers and the roles that they occupy and, as such, may need to change roles or people to reach developmental milestones. However, their ability to make such changes may be constrained until they can obtain the financial and social capital resources that the achievement of developmental milestones provides and which facilitate further change. This professionalization paradox may offer an additional explanation of why it is rare for entrepreneurial firms to ever reach these milestones and more generally to succeed. Our finding on the lack of window dressing in the form of adding roles or members in advance of resource milestones further highlights this paradox. Unlike research on other forms of window dressing (Chen et al., 2008), our sample includes firms that never get venture capital or go public, and our findings thus raise

questions about whether window dressing is a strategy that firms follow or is an artifact of sampling successful firms. Once a firm obtains resources, this facilitates team changes (see also Boeker & Wiltbank, 2005), but not all firms are able to obtain resources. Our examination of how developmental milestones interact with TMT overqualification and underqualification to influence TMT evolution thus harkens back to an earlier tradition of research that emphasized organizational life stages (e.g., Greiner, 1972), which established that processes can and do operate differently at different stages in a firm's development.

Further contributions to the entrepreneurship literature include our findings that over and underqualification have asymmetrical effects on TMT evolution. Many entrepreneurial studies point to the importance of the quality of the top managers for new venture success (e.g., Burton et al., 2002; Franke et al., 2008; Hsu, 2007). Our study suggests, however, that overqualified TMTs may fail to take advantage of the opportunities their excess capabilities afford. For example, because firms do not explicitly signal their full capabilities through the role structure, investors may underestimate the value of that new venture. Not being able to attract those resources, in turn, may make it difficult to respond to that misfit.

Next, our study goes beyond previous entrepreneurship studies of growth in the TMT capabilities of entrepreneurial firms that count the overall size of the team. Rather there are different ways to expand – by adding people or by adding roles – and the two have differing implications for new ventures. Thus we differentiate whether adding team members is associated with adding breadth to the TMT in the form of structural elaboration, or whether it is the result of adding capacity to areas of established expertise by hiring additional senior managers. Our results suggest that simply adding more managers to the count may have unintended negative consequences when those managers do not have the right skills: adding excess skills may make future hiring less likely. Nor would it be accurate to treat the addition of a new person into a new role as identical to the addition of a new person into an existing

role. Manager counts must be considered in the context of TMT structural needs. Moreover, conceptually distinguishing structural elaboration and capability reinforcement as alternative approaches to TMT growth and professionalization points to avenues for future research and provides an overarching framework for understanding the literature that has examined the emergence, diffusion, and performance implications of specific TMT roles such as the Chief Operating Officer, Chief Financial Officer, or VP of Human Resources (Hambrick & Cannella, 2004; Welbourne & Cyr, 1999; Zorn, 2004).

Beyond informing literature on entrepreneurship, these results contribute more generally to research on upper echelons. While upper echelons scholars recognize that there are costs to mismatch between the experiences of top executives and structures in which they work (e.g., Burton & Beckman, 2007; Chen & Hambrick, 2012), to date there has been very little attention to the phenomenon of misfit at the level of the TMT. This study examines a setting in which misfit is likely to occur in top teams (i.e., new ventures), and shows that misfit acts both as a catalyst to change and a source of inertia in TMT structure and composition. It ultimately answers calls to more fully explain the characteristics of TMTs (Finkelstein, Hambrick, & Cannella, 2009; Hambrick, 2007) by examining these types of teams in their early stages.

In addition, we contribute to theories of role change. Though there is substantial evidence of inertia in various aspects of organizational and role structures, even in entrepreneurial organizations (e.g., Baron et al., 2001; Beckman & Burton, 2008; Burton & Beckman, 2007), it is also evident that these structures must and do change over time. However, we know relatively little about how and why those role structure changes happen (Cohen, 2013). When previous research has explored change in roles, it is most often as a response to individual motivations (e.g., Wrzesniewski & Dutton, 2001) or external pressures (e.g., Zorn, 2004). However, we find that structural role elaboration also results from an

internal structural team factor, TMT overqualification, in which top managers have functional experiences beyond those required by the roles within the TMT.

Finally, we build on the person-job misfit literature with two methodological shifts. Instead of focusing on individual responses to misfit (e.g., dissatisfaction and turnover) (Kalleberg, 2008; Kristof-Brown et al., 2005), we explore how misfit at a team level influences changes to team composition and team structure. As such, this study contributes to a growing body of literature on team-level conceptualizations of fit (e.g., DeRue & Hollenbeck, 2007; Seong & Choi, 2014). We also investigate two distinct forms of misfit: overqualification and underqualification. Person-job misfit literature has generally not distinguished between these (Erdogan et al., 2011); however, doing so allows us to be more precise in explaining how misfit alters role structures and people within the TMT.

Limitations and Future Directions

While this paper makes several unique contributions, it has some limitations. First, it is difficult to know from this study whether the net effects of misfit are good or bad for the firm and its top managers. For instance, the addition of new roles can be seen as a form of individual reward (Baron & Bielby, 1986; Baron & Pfeffer, 1994) and as a way of taking advantage of unforeseen organizational opportunities (Miner, 1987; Miner & Estler, 1985), but is also an additional form of turbulence for already-turbulent new ventures. Similarly, hiring may bring additional capabilities and resources such as prestige into new firms, but the costliness and potential impermanence of some hires may not translate into long-term gains in these areas (Chen et al., 2008). Future studies should thus incorporate measures of firm performance to better understand whether changes to the TMT as a result of misfit are ultimately beneficial or detrimental as new ventures develop.

Next, though we observe patterns of change in top management teams due to misfit, it is unclear whether these changes to people and roles are intentional strategies on the part of

top managers or more serendipitous processes. For example, elaborating the TMT structure by adding new roles can be due to a deliberate effort to recruit or retain specific individuals or it can evolve more organically around perceptions of managerial expertise (Bunderson & Sutcliffe, 2002; Miner, 1987). The results of this study reveal the overarching effects of misfit on changes to the TMT, but do not isolate the influence of the different mechanisms that explain these effects (e.g., need versus opportunity versus resources). Therefore, future studies might assess top managers' perceptions of TMT misfit to better understand whether they are recognizing and responding to misfit or whether these changes are occurring in lieu of a deliberate strategy to bring roles and people back into alignment.

We differentiated between overqualification and underqualification but future work might explore differences even within these types of misfit. For instance, the effects of overqualification on new roles might differ between a TMT that has no marketing role and people with marketing backgrounds and a TMT that has one marketing role and two people with marketing experience. Would both be equally likely to add new roles? We also considered TMT misfit without respect to industry expectations of a new venture's composition and structure. Future research could model fit using this external lens.

We found that TMT misfit only invites responses when new firms have achieved developmental milestones. Future research could examine factors that stifle TMT advances even when firms have the resources associated with developmental milestones. For example, powerful founder CEOs (e.g., those with large ownership control) may resist TMT change (cf. Boeker, 1992; Fischer & Pollock, 2004). In analysis not shown here, we examined the effects of three-way interactions between TMT misfit, firm development, and a dummy variable indicating that the CEO was a founder, on new TMT hires and roles. We found evidence consistent with the idea that a founder CEO might constrain hiring in response to TMT underqualification; however, more precise measures of CEO power should be used to provide

definitive tests of this idea. Further, the inability of firms to alter their composition and structure without first achieving firm developmental milestones may suggest there are other factors endogenous to the firm that drive both misfit and TMT change. We see the impact of misfit on TMT hiring and adding new roles, but it is impossible to rule out that some other factor is driving both effects. Related to this, our sample of firms has high rates of obtaining venture capital and going public, higher than one might expect with a sample of firms in a broader time period or geographic region. Future research should consider firms in other regions where more firms fail to reach these milestones.

Although we find effects of TMT misfit on new hires and roles, the base rates of these events are small. For example, TMT underqualification increases the rate of new hires by 7 percent but most firms in our sample (about 65 percent) do not hire anyone in a given year. However, the fact that minimally altering the independent variable (e.g., a TMT is misfit by one missing qualification) results in changes to the dependent variable (e.g., hiring) and that these effects cumulate over time, suggests that these results, if not numerically large, are theoretically important (Abelson, 1985; Prentice & Miller, 1992). Finally, we examined a relatively small sample of firms from a narrow range of industry sectors, in a particular region, and at a moment in time of tremendous growth and economic success. Our results may not generalize and future scholars must test the boundary conditions of our ideas.

Managerial Implications

This paper highlights the importance of misfit in new venture top management teams as a predictor of hiring and role elaboration, particularly for firms that have achieved developmental milestones. In these firms, TMT overqualification may reduce the need to hire additional managers to increase the capabilities of the TMT; however, these firms could add roles that better incorporate top managers' prior experiences to more accurately signal the quality of the TMT. Thus top managers should be flexible with regard to roles and the

structure of work, particularly when there is overqualification among managers relative to the current role structure. In addition, TMT underqualification is likely to result in more stability to role structures yet more change in the people who move into these roles. Specifically, newcomers may need to be hired to support gaps in skills relative to these existing roles. While these actions may represent strategic choices in team composition, if the roles available within the team are fixed (e.g., new roles are not added) this may constrain future rewards and opportunities. In short, this may be akin to a promotion paradox (Phillips, 2001), albeit at a different level of analysis, where TMT underqualification provides short-term opportunities for new hires but perhaps less long-term development of TMT structures. In addition, our results point to the importance of the developmental stage: firms are only able to change the TMT, regardless of the level of misfit, after achieving some developmental milestones. This points to the importance of hiring people and creating roles with a good fit from the beginning, rather than hoping to grow into roles or add people over time.

Conclusion

In sum, this study reveals that TMT misfit acts as a catalyst for changes to roles and people within new venture TMTs but that its effects are dependent upon the type of misfit and the level of firm development. Once new ventures have achieved developmental milestones, overqualified TMTs elaborate their structural roles whereas underqualified TMTs hire new people. Prior to the achievement of developmental milestones, misfit TMTs are less likely to make these changes despite the need to do so. Ultimately, this study provides a more nuanced understanding of the characteristics of entrepreneurial top management teams by attending to phenomena that exist at the intersection of composition and structure.

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TABLE 1

Descriptive Statistics and Correlations Among Study Variables^a

Variable	Mean	s.d.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. TMT hiring	0.67	1.12																
2. New TMT roles	0.46	0.82	0.70															
3. Firm development	0.97	0.79	0.23	0.19														
4. TMT underqualification ^b	0.47	0.92	0.16	0.08	0.06													
5. TMT overqualification ^b	2.45	2.27	0.16	0.08	0.53	0.05												
6. Computer industry	0.44	0.50	0.04	-0.01	-0.14	-0.01	-0.01											
7. Manufacturing industry	0.04	0.19	-0.11	-0.10	-0.24	-0.05	-0.18	-0.18										
8. Medical industry	0.14	0.34	0.02	0.07	0.20	0.03	0.01	-0.35	-0.08									
9. Research industry	0.03	0.17	-0.10	-0.10	-0.22	-0.06	-0.11	-0.16	-0.04	-0.07								
10. Semiconductor industry	0.13	0.33	-0.02	-0.01	0.08	0.02	0.10	-0.34	-0.08	-0.15	-0.07							
11. Telecommunications industry	0.23	0.42	0.04	0.04	0.14	0.01	0.06	-0.48	-0.11	-0.22	-0.09	-0.21						
12. Firm age ^b	67.14	46.01	-0.11	-0.16	0.32	-0.20	0.32	-0.10	-0.03	0.00	0.03	0.05	0.09					
13. Team size ^b	4.40	3.35	0.28	0.14	0.59	0.17	0.71	-0.09	-0.15	0.01	-0.12	0.14	0.10	0.36				
14. Team tenure ^b	40.70	29.18	-0.24	-0.23	0.01	-0.31	0.00	-0.09	0.11	-0.09	0.22	0.03	0.01	0.71	-0.02			
15. Team tenure (s.d.) ^b	16.32	17.03	0.06	-0.01	0.43	0.00	0.40	-0.11	-0.16	-0.01	-0.15	0.12	0.18	0.67	0.47	0.30		
16. Functional diversity ^b	0.63	0.24	0.13	0.07	0.46	-0.03	0.57	-0.08	-0.26	0.01	-0.07	0.14	0.13	0.30	0.54	0.05	0.44	
17. TMT exits	0.54	1.05	0.36	0.10	0.35	0.05	0.43	0.03	-0.10	-0.02	-0.08	0.01	0.05	0.25	0.55	0.02	0.31	0.29

^aN = 17,659 observations from 167 firms; Correlations > |.01| are significant at p < .05; ^bLagged by twelve months.

TABLE 2

Results of Panel-Poisson Regression Analysis for TMT Hiring and New TMT Roles^a

Variables	TMT Hiring			New TMT Roles		
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Computer industry	-0.15 (0.18)	-0.13 (0.18)	-0.13 (0.18)	-0.29 (0.18)	-0.31+ (0.17)	-0.31+ (0.17)
Manufacturing industry	-1.91*** (0.40)	-1.81*** (0.39)	-1.84*** (0.40)	-1.87*** (0.40)	-1.73*** (0.39)	-1.80*** (0.39)
Medical industry	-0.07 (0.23)	-0.13 (0.23)	-0.13 (0.23)	0.17 (0.23)	0.11 (0.22)	0.13 (0.23)
Research industry	-2.48*** (0.54)	-2.37*** (0.54)	-2.41*** (0.54)	-4.39*** (0.84)	-4.20*** (0.84)	-4.23*** (0.84)
Semiconductor industry	-0.08 (0.25)	-0.10 (0.25)	-0.08 (0.25)	-0.05 (0.25)	-0.03 (0.25)	-0.02 (0.25)
Firm age ^b	-0.01*** (0.00)	-0.01*** (0.00)	-0.01*** (0.00)	-0.01*** (0.00)	-0.01*** (0.00)	-0.01*** (0.00)
Team size ^b	0.02*** (0.00)	0.02*** (0.01)	0.02*** (0.01)	-0.00 (0.01)	-0.01 (0.01)	-0.01 (0.01)
Team tenure ^b	-0.00* (0.00)	-0.00 (0.00)	-0.00 (0.00)	0.01*** (0.00)	0.00+ (0.00)	0.00* (0.00)
Team tenure (s.d.) ^b	0.02*** (0.00)	0.02*** (0.00)	0.01*** (0.00)	-0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
Blau's index ^b	0.15* (0.06)	0.22*** (0.06)	0.19** (0.07)	0.08 (0.07)	-0.11 (0.08)	-0.03 (0.08)
TMT exits	0.19*** (0.01)	0.20*** (0.01)	0.21*** (0.01)	-0.12*** (0.01)	-0.14*** (0.01)	-0.14*** (0.01)
TMT hiring	-	-	-	0.51*** (0.01)	0.51*** (0.01)	0.51*** (0.01)
New TMT Roles	0.58*** (0.01)	0.58*** (0.01)	0.58*** (0.01)	-	-	-

Firm development		0.16*** (0.03)	0.08* (0.03)		0.10** (0.03)	0.04 (0.04)
TMT underqualification ^b		0.07*** (0.01)	-0.07*** (0.02)		-0.13*** (0.01)	-0.13*** (0.01)
TMT overqualification ^b		-0.03*** (0.01)	-0.02** (0.01)		0.03*** (0.01)	-0.01 (0.02)
TMT underqualification ^b * Firm development			0.11*** (0.01)			-
TMT overqualification ^b * Firm development			-			0.03* (0.01)
Constant	-0.81*** (0.15)	-0.99*** (0.15)	-0.87*** (0.16)	-0.93*** (0.15)	-0.78*** (0.15)	-0.75*** (0.15)
Wald χ^2	6065.91***	6115.83***	6138.58***	4464.54***	4619.61***	4627.85***
Log likelihood	-14088.77	-14039.42	-13999.09	-11868.08	-11804.53	-11801.76
Likelihood-ratio test		98.70***	80.65***		127.10***	5.55*
Observations	17,659	17,659	17,659	17,659	17,659	17,659
Number of firms	167	167	167	167	167	167

^aStandard errors in parentheses. ^bLagged by twelve months.

*** p<0.001, ** p<0.01, * p<0.05, + p<0.10

FIGURE 1

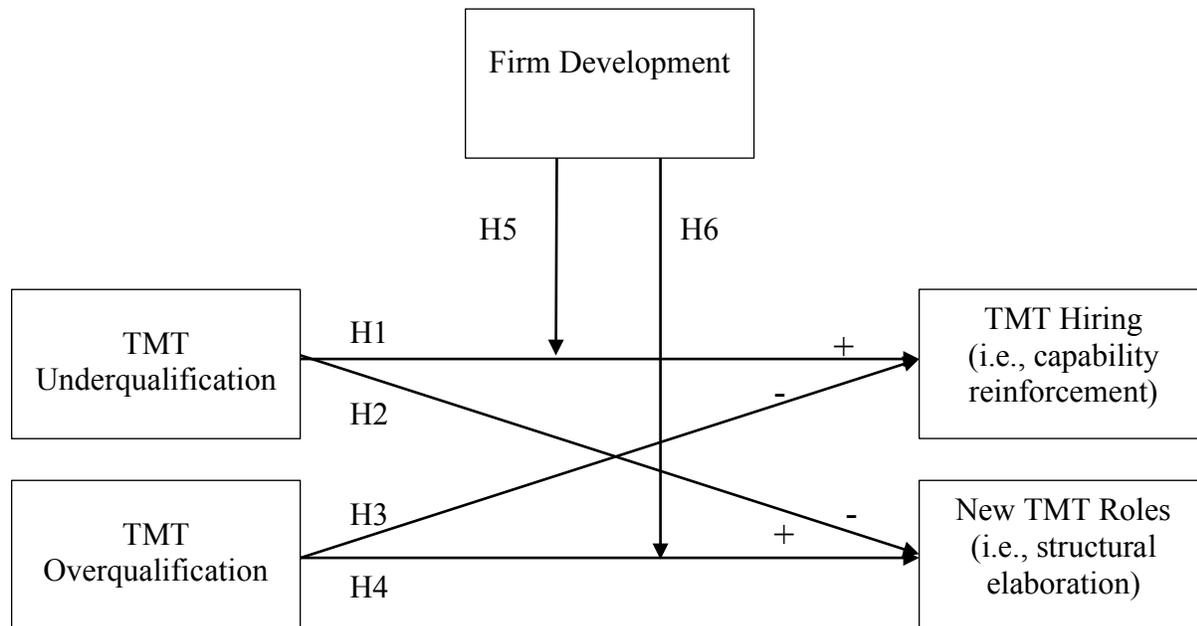
TMT Misfit and Firm Development as Predictors of New Venture TMT Evolution

FIGURE 2

The Effects of TMT Underqualification and Firm Development on Predicted Number of New TMT Hires

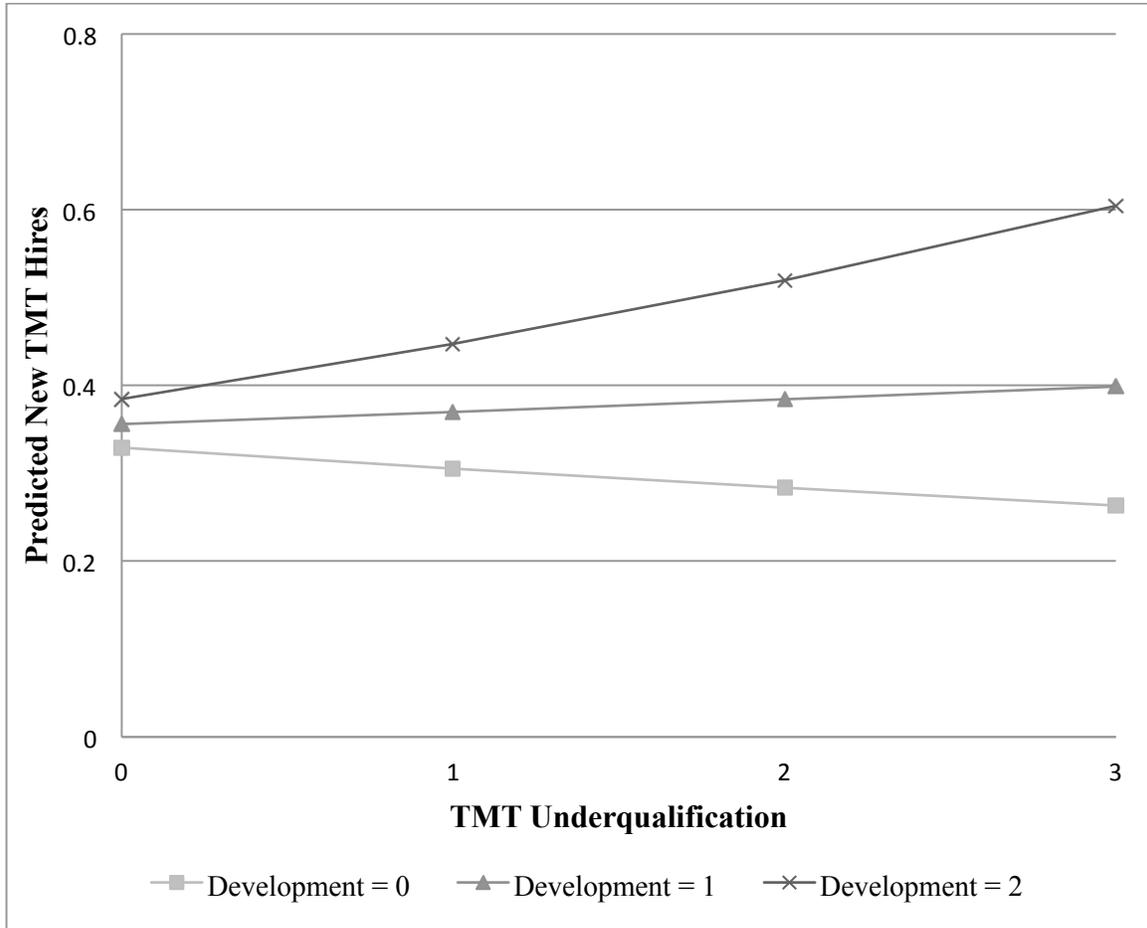
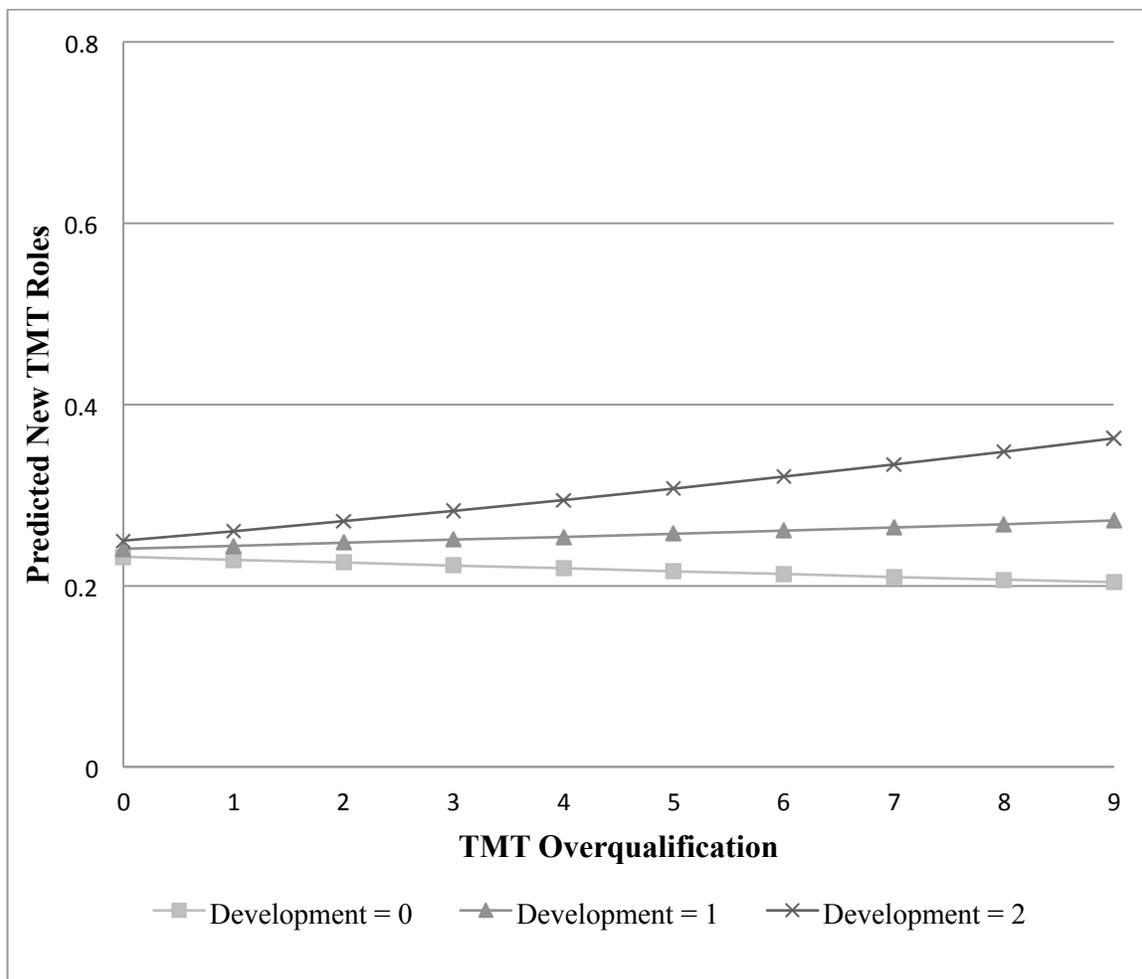


FIGURE 3

The Effects of TMT Overqualification and Firm Development on Predicted Number of New TMT Roles



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