MANAGING INNOVATION IN A MULTI-DIVISIONAL FIRM: WHEN DOES MOBILITY ACROSS DIVISIONS IMPROVE R&D MANAGERS’ PERFORMANCE?

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Abstract

Multi-divisional firms often seek to achieve cross-divisional synergies and develop managerial talent for their innovation activities by transferring their R&D employees through a variety of assignments in different divisions, yet the implications for managers’ ability to contribute to innovation are largely unexplored. To examine these implications, we introduce the concept of an “assignment portfolio,” which refers to the set of assignments an R&D manager has undertaken across divisions. We argue that R&D managers with assignment portfolios characterized by greater coherence across divisions and greater concentration within the current division will perform more effectively, but that these benefits will depend on the extent to which the context of their current division favors exploitation versus exploration. We test our arguments using survey and archival data from 241 R&D managers in a Fortune 500 technology-intensive multinational corporation.
Managing Innovation in a Multi-Divisional Firm:

When Does Mobility across Divisions Improve R&D Managers’ Performance?

ABSTRACT

Multi-divisional firms often seek to achieve cross-divisional synergies and develop managerial talent for their innovation activities by transferring their R&D employees through a variety of assignments in different divisions, yet the implications for managers’ ability to contribute to innovation are largely unexplored. To examine these implications, we introduce the concept of an “assignment portfolio”, which refers to the set of assignments an R&D manager has undertaken across divisions. We argue that R&D managers with assignment portfolios characterized by greater coherence across divisions and greater concentration within the current division will perform more effectively, but that these benefits will depend on the extent to which the context of their current division favors exploitation versus exploration. We test our arguments using survey and archival data from 241 R&D managers in a Fortune 500 technology-intensive multinational corporation.
INTRODUCTION

How can firms achieve cross-divisional synergies in their innovation activities? This is a central challenge for the management of innovation in multi-divisional firms (Van de Ven, 1986). Scholars have emphasized that a key source of competitive advantage for such firms lies in their ability to benefit from the transfer of knowledge across divisions (Kogut & Zander, 1992), scaling up of new products and processes to a wide range of markets (Burgelman & Grove, 2007), and transfer of innovation-related capabilities between divisions over time (Helfat & Eisenhardt, 2004). Researchers have highlighted the importance of cross-divisional linkages in facilitating these processes (Lawrence & Lorsch, 1967), with emphasis on the role of networks between business units (Hansen, 1999; Tortoriello & Krackhardt, 2010; Tsai, 2001). Beyond this, however, we have limited insight into how the individual employees who carry out the firm’s innovation activities can take advantage of the potential for cross-divisional synergies. Developing such insight is important for furthering our understanding of the micro-foundations of innovation in multi-divisional firms (Foss & Pedersen, 2016), as well as for addressing the critical managerial challenge of achieving cross-divisional synergies in these firms.

A common approach that many multi-divisional firms use to help achieve such synergies and develop managerial talent for their innovation activities is to rotate their R&D managers through a variety of assignments in different divisions, often transferring them every few years (Allen, 1977; Katz & Tushman, 1981; Ortega, 2001). These transfers typically involve considerable costs, in the form of both organizational investment and personal adjustment (e.g. Bhaskar-Shrinivas, Harrison, Shaffer, & Luk, 2005; Black, Morrison, & Gregersen, 1999). Differences between divisions can be stark, as employees must come to grips with different value chains and markets, as well as significant variation in assets, capabilities, and knowledge.
Yet while cross-divisional mobility is often viewed as necessary for career advancement (e.g. Mendenhall, Kuhlmann, Stahl, & Osland, 2002), the benefits of different mobility choices for an R&D manager’s performance are far from clear.

In particular, it is not clear whether R&D managers who move across divisions stand to gain greater performance benefits from undertaking assignments in related or unrelated divisions, or how they should balance time spent in a particular division with time spent in other divisions. Prior research on mobility and innovation has failed to adequately address these questions, as it has focused primarily on inter-firm rather than intra-firm mobility, and on the implications of such mobility for the performance of R&D scientists rather than of R&D managers (e.g. Almeida & Kogut, 1999; Corredoira & Rosenkopf, 2010; Hoisl, 2007). In doing so, it has overlooked a common form of mobility that could profoundly shape individual performance. Moreover, extant research usually compares the performance of mobile versus non-mobile individuals, rather than examining how different mobility choices made may affect their performance. Thus, it has not considered the possibility that the performance implications of different moves may be contextually contingent, ignoring the possibility that the benefits of cross-divisional mobility for an R&D manager’s current performance might depend on characteristics of the division where the manager currently works.

To shed light on these questions and gain insight into when an R&D manager’s performance may benefit from their cross-divisional mobility, we take a portfolio perspective on managerial mobility. We introduce the concept of an “assignment portfolio” to refer to the set of assignments that a mobile manager has undertaken in different divisions within the firm. In order to understand how the characteristics of their assignment portfolio may relate to an R&D manager’s performance, we build on prior theories of learning from mobility (e.g. Song,
and of organizational learning more generally (e.g. March, 1991). We extend these theories by focusing on managerial learning, and by identifying two core managerial roles – strategic overview and operational oversight – that we argue may be performed more effectively or less effectively, depending on the learning that R&D managers have gained from their assignment portfolios.

In developing our arguments, we start by considering two characteristics of an R&D manager’s assignment portfolio: its coherence across divisions, which reflects whether managers have worked in related or unrelated divisions; and its concentration in the current division, which reflects the balance between the time spent in this division and time spent in other divisions. We argue that variation in the coherence and concentration of R&D managers’ assignment portfolios will be associated with differences in their strategic overview and operational oversight capabilities, and thus with variation in their managerial performance. We then consider the possibility that the benefits of coherence and concentration for an R&D manager’s performance may also depend on the context of the manager’s current division – specifically, the extent to which a context favors exploitation versus exploration (Katila & Ahuja, 2002). Contexts that favor exploration are usually characterized by higher environmental uncertainty and greater operational slack than contexts that favor exploitation (Voss, Sirdeshmukh, & Voss, 2008). We argue that the levels of uncertainty and slack in an R&D manager’s current division will affect the extent to which that manager can realize the benefits of their learning from a more coherent or concentrated assignment portfolio for performing effectively in that division.

We test our hypotheses using detailed data on R&D managers working at Jupiter, a pseudonym for a Fortune 500 multi-divisional technology-intensive firm with extensive R&D operations. We combine rich insights from our field interviews with data from detailed surveys,
the company’s human resource records, and its corporate website to explore how R&D managers’ cross-divisional assignment portfolios affect their performance. Our core dataset includes 241 managers who have undertaken assignments across 25 different divisions within the firm, supplemented with additional data on the environmental uncertainty and operational contexts of those divisions collected through two secondary surveys of R&D directors and R&D technologists.

Our findings offer three contributions to scholarly understanding of innovation management and employee mobility within firms. First, we advance understanding of the management of innovation by examining the performance of R&D managers. While there is extensive research on R&D scientists and inventors, the work of R&D managers has received little attention. Yet R&D managers play distinctive roles that are critical for successful innovation in firms, making greater understanding of the factors that enable them to perform effectively valuable both for organizations conducting innovation and for scholars studying innovation management. Second, we offer insight into the micro-foundations of innovation within multi-divisional firms in particular, by examining how individual employees’ assignments across divisions enable them to benefit from cross-divisional synergies in their innovation activities. Our findings show that the performance benefits for R&D managers vary with the coherence and concentration of their assignment portfolios. Third, we contribute to the literature on learning from mobility by offering a portfolio perspective that examines when mobility is beneficial for the performance of those who move. This perspective highlights not only the characteristics of the assignments undertaken by mobile managers, but also the value of the learning gained from them in the current context. Our findings reveal that the performance benefits of different types of mobility depend on the extent to which an R&D manager’s current
division favors exploitation versus exploration, indicating that greater attention to the contingent value of mobility is warranted.

**ASSIGNMENT PORTFOLIOS AND MANAGERIAL PERFORMANCE**

**The Role of R&D Managers**

Research on the role of individuals in developing technological innovations in large multi-divisional firms has focused primarily on technical R&D professionals such as inventors, engineers, and scientists, and on how their technical knowledge – gained through in-house research, inter-firm mobility, or boundary-spanning networks – affects their ability to contribute to their organization’s innovation outcomes (e.g. Almeida & Kogut, 1999; Corredoira & Rosenkopf, 2010; Hoisl, 2007). Much less research has considered how R&D managers help their organization achieve innovation goals. This is surprising given the critical role R&D managers play in the conception, execution, and delivery of innovation projects and programs (Van de Ven, 1986). Managers are responsible for ensuring that innovation efforts are aligned with the firm’s strategic market and financial objectives, and that innovation projects meet time and cost constraints (Blau & Scott, 1962). Fundamentally, R&D managers are charged with improving the firm’s profitability by directing the research and development activities of their teams towards the realization of innovations that create new revenue streams, increase existing revenue streams or bring about significant improvements in the production and operational processes within the firm, while keeping the costs of R&D under control. We distinguish two core aspects of the R&D manager’s role in multi-divisional firms that help them achieve these outcomes: strategic overview and operational oversight.

First, R&D managers are responsible for strategic overview of the firm’s innovation efforts: that is, for ensuring that innovation efforts are aligned with the strategic goals of their division and of the broader organization. To achieve this goal, R&D managers are tasked with
supervising the entire innovation effort and coordinating the inputs involved, both within and across divisions. Although R&D efforts may be initiated with a specific market application in mind, unexpected technical developments, changing market requirements, or new market or competitor intelligence may shift the application areas that the new technology is able to address, or broaden the applications beyond those originally intended (Gruber, MacMillan, & Thompson, 2008). Conversely, as projects progress and evolve, expertise and capabilities within a team or division may turn out to be insufficient to meet their objectives, heightening the need for R&D managers to act as boundary-spanners and access complementary resources or capabilities that reside outside the focal division (Ancona & Caldwell, 1992; Hargadon & Sutton, 1997). In such situations, R&D managers are expected to play a leading role in cross-disciplinary innovation efforts. They also need to champion R&D projects with senior decision makers (Howell & Higgins, 1990). Since the strategic oversight role is central to guiding the form and direction of innovation efforts, R&D managers who excel in carrying out this responsibility will be better able to design and deliver innovation projects and programs that create new revenue streams or increase existing revenue streams for the firm.

Second, R&D managers are responsible for operational oversight of R&D efforts: that is, they are accountable for the delivery of specific innovation projects on time and within budget, as well as for the achievement of broader innovation targets (Benner & Tushman, 2003; Van de Ven, 1986). This often requires R&D managers to recognize and tackle problems that typically beset innovative projects, such as escalating commitment to current ideas, under-estimation of developments costs, or excessive flexibility in the meeting of project milestones (Schilling, 2005; Tidd, Bessant, & Pavitt, 2005). At the same time, they need to maintain the courage and confidence to support the exploration of promising and even ‘foolish’ ideas (Kanter, 2000;
March, 2006). Operational oversight also involves directly managing R&D staff, including allocating individuals with appropriate skills to specific projects (Brown & Eisenhardt, 1995), deciding how much strategic and operational autonomy to grant them (Bailyn, 1985), providing a sense of ‘psychological safety’ to undertake high risk, creative efforts (Edmondson, 1999), and facilitating their personal development. As operational oversight is critical for ensuring that innovation efforts are carried out efficiently and do not exceed time or budget constraints, R&D managers who excel in their conduct of this responsibility will be better able to keep the costs of R&D under control and projects on target.

**Cross-Divisional Mobility and R&D Managers’ Performance**

Many large multi-divisional firms expect prospective or current managers to spend time working in different divisions of the firm to help develop their managerial capabilities. For R&D managers in particular, working in different divisions provides a way to build the strategic overview and operational oversight capabilities that are critical for effectively managing innovation projects and programs – that is, for delivering innovations that generate increased revenues while controlling R&D costs. However, working in different divisions involves career decisions about which divisions to work in and how long to work in them – and some mobility choices may position R&D managers to perform more effectively than others.

Prior research suggests that mobility enables R&D workers to transfer learning from one setting to another setting (Almeida & Kogut, 1999; Groysberg, Lee, & Nanda, 2008; Song et al., 2003). While this research usually focuses on mobility between firms rather than within firms, it suggests that working in different divisions within a firm should enable R&D managers to transfer learning and develop capabilities that may be valuable across those divisions. In particular, working in different divisions might enable R&D managers to learn about new
approaches and opportunities for generating revenues that they can import to their current
division. In addition, working in different divisions might increase both the ability and
willingness of R&D managers to undertake revenue-generating projects that span divisions.
Cross-divisional mobility thus can enable managers to improve their strategic overview
capabilities. Likewise, working in different divisions might enable R&D managers to learn about
ways to control costs that they can import to their current division, such as transferring risk of the
development of a key component to trusted suppliers. And they might also be more able and
more willing to undertake cost-reducing measures that involve spanning divisions. Hence, cross-
divisional mobility can also enable R&D managers to improve their operational oversight
capabilities.

However, while cross-divisional mobility can offer learning benefits, it may not always
prove beneficial for managerial performance. The difficulties of adjusting to new environments
have been well documented in the literature on expatriate assignments in particular, and these
may reduce the benefits of working in different divisions. Yet even beyond this, working in
different divisions may offer fewer learning benefits than expected, for three possible reasons.
First, the benefits of learning from different divisions may be lower if these divisions are
unrelated to each other, since the knowledge, insights, and experience gained in one division
may not be relevant to the requirements of effective strategic overview and operational oversight
in another division (Schulz, 2001). Second, the benefits of learning may be lower if the R&D
manager has spent relatively little time in the current division, since extensive knowledge,
insights, and experience gained in other divisions may be less valuable for addressing needs and
realizing opportunities for revenue generation and cost control in the current division if the
manager’s knowledge, insights, and experience in this division is shallow.
Given these tensions between the benefits and costs of cross-divisional mobility, the central question we address in developing our hypotheses below is not whether (or how much) cross-divisional mobility is beneficial for an R&D manager’s performance, but rather *when* cross-divisional mobility is beneficial for an R&D manager’s performance. In particular, is cross-divisional mobility more valuable when it involves working in more related or less related divisions and when it involves spending more time in the current division or more time in other divisions? And how does this depend on the context of the manager’s current division?

**Coherence and Concentration of Assignment Portfolios**

To address these questions, we characterize an R&D manager’s assignment portfolio in terms of its levels of coherence and concentration, where “coherence” refers to the extent to which the divisions in which the manager has worked are related to each other, and “concentration” refers to the extent to which the manager has spent time in the current division relative to other divisions.

When an R&D manager’s assignment portfolio is more coherent, the benefits of having worked in different divisions for that manager’s performance is likely to be greater because the knowledge, insights, and experiences gained through these assignments are more mutually relevant. Related variety promotes the development of abstract principles or “schema” that facilitate acquisition of related skills or knowledge sets (Lindsay & Norman, 1977) and enhance the learning process (Schilling, Vidal, Ployhart, & Marangoni, 2003). Thus, assignments that are more mutually relevant increase the manager’s absorptive capacity for gaining learning from related areas, and for applying that learning to adjacent areas (Cohen & Levinthal, 1990). As a result, the manager is more likely to be able to identify relevant approaches or opportunities for generating new revenues or controlling their R&D costs from other related divisions that can
usefully be imported to their current division. The manager is also more likely to undertake revenue-generating projects or cost-saving initiatives that span divisions that are more closely related. Accordingly, the manager’s strategic overview and operational oversight capabilities are likely to be enhanced more by having worked in a more related set of divisions than in a less related set of divisions, enabling them to perform more effectively at generating revenue while controlling R&D costs. Hence we predict:

**H1:** Greater coherence of an R&D manager’s assignment portfolio across divisions will be positively associated with managerial performance.

When an R&D manager’s assignment portfolio is more concentrated in the current division, meanwhile, the benefits of having worked in different divisions for that manager’s performance are also likely to be greater, in this case because the manager has a stronger understanding of how knowledge, insights, and experience gained from other divisions may or may not address the needs of the current division or offer valuable opportunities for this division. For example, a manager who has spent some time in other divisions as well as substantial time in the current division may identify a potentially valuable market-technology linkage with another division – but then recognize that this linkage would not in fact fit with the needs of the current division. In contrast, a manager who has spent considerable time in other divisions but only relatively little time in the current division might identify the same market-technology linkage without recognizing the risks and drawbacks of trying to import it to the current division, due to their superficial understanding of this division. Thus, a manager’s strategic overview and operational oversight capabilities may benefit more from mobility across divisions if that manager has spent more relatively time in the current division and relatively little time in other divisions. Accordingly we predict:

**H2:** Greater concentration of an R&D manager’s assignment portfolio within the current division

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will be positively associated with managerial performance.

**Moderating Effects of Environmental Uncertainty and Operational Slack**

While we expect coherence and concentration to be positively related to an R&D manager’s performance overall, theories of organization learning suggest that strength of these relationships is likely to be contingent on the extent to which the context of the current division favors exploration versus exploitation (March, 1991). All R&D activities are focused on innovation, but within large multi-divisional firms much innovation is exploitation-oriented, while some is more exploration-oriented (Anderson & Tushman, 1990; Danneels, 2002). Exploitation involves refining and extending existing competences, technologies, and paradigms in order to generate incremental advances, while exploration involves experimenting and taking big risks with new alternatives in order to generate radical breakthroughs (March, 1991; Voss et al., 2008). Prior research has established that contexts that favor exploration tend to be characterized by higher environmental uncertainty, since market preferences for radically new products are often ill-defined and difficult to predict and the potential and feasibility of fundamentally new technologies is unproven (Jansen, Van Den Bosch, & Volberda, 2006; Tidd, Bessant, & Pavitt, 1997). Additionally, contexts that favor exploration tend to have greater operational slack, in the form of more available resources such as time or funding, which buffer the work environment from short-term pressures and create conditions that allow for more experimentation and risk-taking (Levinthal & March, 1981). In contrast, contexts that favor exploitation tend to have lower environmental uncertainty and less operational slack, since these reduce motivation and ability to pursue risky experimentation and radical innovation (Voss et al., 2008).

*Environmental uncertainty.* Environmental uncertainty in innovation-focused settings typically takes the form of uncertainty related to markets, such as rapidly changing customer preferences (Markides, 1997), or to technologies, such as fast-moving technical frontiers (Suarez
& Lanzolla, 2007). Prior research on learning has found that while learning from more proximate or closely related areas is beneficial for exploitation, learning from more distant or unrelated areas is more beneficial for exploration, i.e. when the paths toward successful innovation are less clear and predictable (Rosenkopf & Nerkar, 2001). Thus, divisions with high environmental uncertainty tend to be more open to diverse inputs and experiences, and R&D managers are expected to monitor a more diverse array of market trends and technological advances, as well as supervise more divergent innovation efforts, in order to effectively carry out their strategic overview and operational oversight responsibilities.

We argue that R&D managers who have worked in a less coherent set of divisions will be better able to meet those expectations. Managers with a relatively incoherent assignment portfolio likely have developed more diverse knowledge and understanding of more distant markets and technologies, as well as a wider-ranging set of network contacts on whom they can draw to identify potential approaches and new opportunities for generating revenues within their current division. In contrast, R&D managers who have worked in a more coherent set of divisions are likely to have less knowledge breadth, more redundancy in their networks, reducing their ability to identify promising ideas from distant divisions and recognize the potential value of importing them to the current division, as well as their ability to oversee divergent innovation efforts. Additionally, R&D managers who have worked in more closely related divisions might be less prepared or able to identify and undertake revenue-generating initiatives that span distantly related divisions, which limits their ability to meet the division’s demand for greater exploration.

Taken together, we argue that the benefits of a more coherent assignment portfolio are reduced in more uncertain contexts, while a less coherent assignment portfolio can enable
managers to build strategic oversight and operational capabilities that are more valuable for their performance in such contexts, we predict:

\[ H_3: \text{The relationship between the coherence of an R&D manager’s assignment portfolio and their managerial performance will be less positive in divisions with greater environmental uncertainty.} \]

In a division with greater environmental uncertainty, R&D managers’ ability to effectively maintain strategic overview and operational oversight is likely to benefit more from having spent more time in other divisions, rather than from assignment portfolios that are very concentrated in the current division.

First, the advantages of familiarity associated with substantial time spent in the current division are diminished. Specifically, when markets or technologies are uncertain, more time in the current division can lead to strategic myopia and unproductive repetition of established ways of approaching markets and technologies (Levinthal & March, 1993). R&D managers whose experiences in other divisions were relatively superficial may struggle to fully understand and appreciate the potential of ideas from other divisions, align their initiatives across divisions, or muster the support needed to successfully champion their innovations – and these limitations will be more consequential in contexts with higher environmental uncertainty where deviation from the status quo is required.

Second, the advantages of diversity associated with substantial time spent in other divisions are enhanced. More time in different divisions enhances a manager’s ability to sense shifting customer needs and new technical trends and to align their initiatives with other divisions. It also helps their ability to explore opportunities for recombination of previously disconnected technologies, which divisions with greater levels of uncertainty would place greater importance to (Danneels & Sethi, 2011; Fleming & Sorenson, 2001). Additionally, a manager’s ability to champion novel ideas is likely to benefit more from greater exposure to other divisions,
both to inform the selling of risky ideas within their current division and to generate support from other parts of the firm (Howell & Higgins, 1990). For ideas that deviate more strongly from the current division’s status quo, adding the voice of informed supporters outside the division may help shift the balance more strongly in favor of support for novelty.

Taken together, because the value of a highly concentrated assignment portfolio is lower for R&D managers in more uncertain contexts while the value of a less concentrated assignment portfolio is higher, we predict:

H4: The relationship between the concentration of an R&D manager’s assignment portfolio and their managerial performance will be less positive in divisions with greater environmental uncertainty.

Operational Slack. Operational slack in innovation-focused settings often takes the form of time available for experimentation, both on a short-term basis (e.g. because daily work is not too pressured) and on a longer-term basis (e.g. because project timeframes are more extended) (Levinthal & March, 1981; Voss et al., 2008). Greater slack reduces the benefits that managers can gain from a more coherent assignment portfolio, and increases the benefits that can be gained from having worked in a more diverse set of divisions.

When R&D managers do not have enough time to engage in experimentation or play out risky ideas, it will be more efficient for them to draw on local knowledge, insights, and experience when identifying and importing new approaches to revenue generation or cost control from other divisions or implementing cross-divisional innovation initiatives. Such local inputs are likely to be easier to align and incorporate into the current division, and more quickly accepted by its employees. However, in divisions where there is more time for exploration because daily work is less pressured or project timeframes are more extended, R&D managers can benefit from assignments that have given them opportunities to develop more diverse and
distant knowledge and wide-ranging networks. For example, they have more slack to experiment with drawing on analogies or searching for knowledge from distant domains in order to generate new revenue streams (Laursen, 2012), or to try out different cost-control approaches in their own division that they have seen elsewhere. Moreover, since exploratory, long-term projects tend to run over time and budget, R&D managers with diverse divisional experience are drawn upon to a broader set of practices and learning about how to keep cost down and stick to deadlines. Thus, an assignment portfolio that spans a more diverse set of divisions thus has greater potential advantages for an R&D manager in a division with greater operational slack. Hence, we predict:

\[H5: \text{The relationship between the coherence of an R&D manager’s assignment portfolio and their innovation performance will be less positive in divisions with greater operational slack.}\]

Finally, greater slack reduces the benefits that managers can gain from a portfolio of assignments that are more concentrated in the current division, and increases the benefits gained from having spent more of their time in other divisions. An R&D manager who has spent more time in the current division is likely to be more efficient at carrying out both strategic overview and operational oversight responsibilities within that division because their familiarity with the division enables them to more quickly identify potential revenue generation opportunities and address potential cost control problems inside the division. However, when daily work is less pressurized or project timeframes are more extended, the importance of such efficiencies is reduced (Voss et al., 2008). Moreover, the potential value of having spent more time in other divisions is greater, because R&D managers have more capacity to experiment with novel ideas for revenue generation or cost control that draw on the knowledge they have gained through their time in other divisions. Since they are under less time pressure in their current division, they also have more time to reach out to their networks in these other divisions in order to access new ideas and information, and to solicit their support for risky innovation initiatives. Thus, a more
concentrated portfolio has fewer advantages while a less concentrated portfolio has greater advantages in a division with greater operational slack. Hence, we predict:

\[ \text{H6: The relationship between the concentration of an R&D manager's assignment portfolio and their innovation performance will be less positive in divisions with greater operational slack.} \]

**METHOD**

**Data and Research Design**

This study is based on survey data from R&D managers in Jupiter, supplemented with archival data and qualitative interviews. Jupiter is a pseudonym for a Fortune 500 technology-intensive company with R&D operations in 25 divisions. The company operates a dual career ladder structure, where R&D employees with approximately ten years of experience in the R&D organization face the choice of progressing their careers along either a management pathway or a technical pathway, to become either R&D managers or R&D technologists. Jupiter’s R&D employees tend to stay with the company for the long-term.

Employees who choose the managerial career path are expected to undertake assignments in different divisions of the firm. Jupiter believes that career mobility is critical for R&D managers, to help them develop a better understanding of the organization as a whole and greater awareness of innovation opportunities across divisions. In particular, there is strong belief that moving across divisions helps R&D managers to avoid becoming trapped in established ways of thinking. As one manager explained: “*If [you] stick within a certain area for way too long, [you] tend to be, ‘I've been there, I've done that’, and you have a little box and you shut yourself off of new ideas because you've been there way too long*”. This emphasis on internal mobility is common for R&D managers in large multi-divisional organizations, though it is much less common for technical R&D staff who hold specialist knowledge that is often highly specific to a particular product division. At Jupiter, promotions typically happened after R&D managers had
proved themselves in a new division, rather than when they moved divisions. However, there was still a strong belief that moving across divisions helped accelerate career advancement. Despite the general sense that career moves were both beneficial for R&D managers’ performance and important for their career advancement, senior management in Jupiter voiced concerns about whether mobility was always as helpful as it might be, and whether some types of mobility might be more helpful than others.

To address these questions, we first conducted interviews with 30 R&D managers, to gain insight into their role and understand their mobility across divisions within the company. We also interviewed 40 R&D technologists, who worked closely with the R&D managers, and five R&D directors, who supervised them, to more fully understand the context of the R&D managers’ work. These interview data provided information on their strategic overview and operational oversight of Jupiter’s R&D efforts and informed the design of our survey instruments, the framing of the survey questions, and the construction of measures with contextual validity in the company. We administered surveys to the full populations of R&D managers (n≈900), R&D technologists (n≈600), and R&D directors (n≈80) in the firm. All surveys were administered anonymously in mid-2015, following invitations from Jupiter’s Chief Technology Officer. The survey response rates were 43% for the R&D managers, 61% for the R&D technologists, and 46% for the R&D directors. We found no statistically significant differences between respondents and non-respondents for any variables on which we had full-population data including performance rating, grade, tenure, location, and division, nor between early and late respondents on key variables of interest in this study. We used responses from the manager’s survey for most independent and control variables, and responses from the technologist and director’s surveys for moderator variables that characterize the divisions in
which the R&D managers worked. Data on the dependent variable – superior innovation performance – were obtained from corporate human resource records.

Because of missing responses to some of the variables used in our empirical models, we had to exclude 24 observations from the R&D manager dataset, which resulted in a sample of 346 R&D managers. Of these, 105 R&D managers (30%) had only worked in one division, and therefore were excluded from our main sample, which thus consists of 241 R&D managers who had undertaken assignments in more than one division. We take account of how potential selection biases this may introduce by estimating a two-stage selection model.

**Dependent Variable**

*Managerial performance.* We measure R&D managers’ performance using end-of-year performance ratings from 2015 obtained from Jupiter’s corporate human resource records. The rating system assessed managers’ performance relative to peers within the same division on an annual basis. All R&D managers were required to fill in a form which asked them to summarize their contributions to the firm’s innovation efforts, including specific details on how their own work and the work of the employees they managed had produced innovative outcomes that led either to increased revenues or to cost savings. This focus on increased revenues or cost savings was viewed as central to a manager’s contributions to innovation at Jupiter, and managers were asked to back their claims with hard data whenever possible. R&D managers were also expected to take a high-level strategic view and to help build new capabilities in important growth areas for the firm. We coded the dependent variable as 1 if the manager received a top performance rating or 0 otherwise. In our sample, 30% of the R&D managers received this rating, consistent with the full population.

**Independent Variables**
Coherence of assignment portfolio. The coherence of an R&D manager's assignment portfolio measures the similarity of all of a manager’s assignments to each other. We consider two assignments to be more similar (or dissimilar) to each other if they relate to divisions that have greater (or smaller) overlap in terms of their core scientific areas. Assignments in the same division are considered once only. We obtained information on the scientific and technological disciplines underpinning each of Jupiter’s divisions from a section in the company’s website that aims to attract new hires for its worldwide R&D operations. This list included broad domains, such as inorganic chemistry and statistical analysis, but also specific areas, such as nutrition and packaging. We constructed binary vectors of 66 different disciplines indicating the relevance (1) or non-relevance (0) of each discipline for each division, and then calculated pairwise Jaccard similarity scores between all combinations of unique divisions in each manager’s assignment portfolio and divided by the number of unique combinations. The coherence of a manager’s assignment portfolio thus is measured as the average pairwise similarity between all pairs of divisions in their portfolio.

Concentration of assignment portfolio. We obtained information on R&D managers’ assignments from the survey, where we asked respondents to specify the division, location, seniority level, and start year of their current assignment and up to three previous assignments. Of the R&D managers in our sample, 50% reported on two assignments, 37% reported on three assignments, and 13% reported on four assignments. The total average duration of their reported assignments was 13.6 years, and the average length of an assignment was 4.9 years. To construct the concentration variable, we first calculated the total number of years each manager spent in their current division, during both their current assignment and any of their previous assignments. On average, managers had spent a total of 5.4 years in their current division. We
then divided this numerator by the total length of their assignment history reported in the survey. The concentration variable thus captures the share of a manager’s total reported assignment portfolio that had been spent in the current division.

**Moderator Variables**

*Division-level environmental uncertainty.* We use two different indicators to measure the level of environmental uncertainty in a manager’s current division: *technological uncertainty* and *market uncertainty*, using responses from the R&D directors’ survey. Our interviews indicated that directors were ideally suited to assess the technological and market uncertainty in a manager’s division because directors typically head divisions at Jupiter and are responsible for strategic decision making at the division level. When multiple directors from the same division responded to our survey, we averaged their responses. The R&D managers in our sample reported assignments in 25 different divisions within Jupiter; we received responses from at least one R&D director for 16 of these divisions. The nine divisions for which we did not receive at least one response were relatively small; only 24 managers in our sample worked in them. For these divisions, we used the value of the environmental uncertainty variables of the higher-order units to which these divisions belong. We used two four-item scales developed by Jaworksi and Kolhi (1993) and adapted by DeLuca and Atuahene-Gima (2007) to measure technological uncertainty (Cronbach’s α=0.80) and market uncertainty (Cronbach’s α=0.74).

*Division-level operational slack.* We use two variables to capture the level of operational slack in a manager’s current division: *daily slack*, based on informal daily time pressure in the division, and *project slack*, based on formal project timeframes in the division. Our interviews indicated that divisions in which R&D employees reported less time pressure in their daily work and longer project timeframes offered a higher degree of operational slack in the form of more
time available for exploratory activities. Conversely, R&D employees who were under more
time pressure and had shorter project timeframes complained about the lack of time to undertake
more exploratory types of research. Our interviews also indicated that division-level operational
slack was best captured by combining the views of R&D managers and R&D technologists,
since they worked closely together on innovation projects and their experiences of operational
slack were highly interdependent. Therefore, to measure daily slack at the division level, we
reverse-coded a five-item scale capturing informal time pressure (Cronbach’s α=0.71), and then
averaged the responses of managers and technologists within the same division to obtain a
division-level measure. Analysis of variance indicated that this measure is a valid division-level
attribute, since the variance of time pressure within divisions (Mean Squares = 1.35) is
statistically significantly smaller (Bartlett’s test = 19.14, p-value= 0.744) than the variation
across divisions (Mean Squares = 1.07). To measure project slack at the division level, we used a
survey question in which respondents were asked, for up to five main projects on their work
plan, when they expected their work to reach the market or be implemented (with four answer
options ranging from <1 year to >5 years). We calculated the share of a respondent’s projects
that were due to reach the market or be implemented in more than one year, and then averaged
this share for managers and technologists in the same division. Analysis of variance confirmed
that variance within divisions (Mean Squares= 0.22) was statistically significantly smaller
(Bartlett’s test= 24.02, p-value= 0.402) than variance between divisions (Means Squares= 0.37),
indicating that this measure of project slack is a valid division-level attribute.

**Control Variables**

We included four sets of control variables in our models. First, we controlled for additional
assignment portfolio characteristics besides our main variables of coherence and concentration.
To capture portfolio size, we controlled for the total number of moves the manager reported between divisions within Jupiter. This variable thus controls for the overall impact of a manager’s level of intra-firm mobility. Although the majority of moves across divisions required changing location too, managers sometimes changed divisions without changing location; conversely, managers sometimes changed locations while staying within the same division. To account for the potential impact of such moves on managerial performance, we also included two variables that count the number of moves across divisions only and the number of moves across locations only. Additionally, we controlled for the total duration of assignments reported by the manager, and for whether there were repeated assignments to the same division within a manager’s portfolio of assignments.

Second, we controlled for several other characteristics of a manager’s career history in the firm. Because our sample of R&D managers covers two levels of seniority, we included a seniority level dummy variable coded 1 for more senior managers. We controlled for a manager’s prior performance by including a speed of promotion variable which is coded as the number of years more or less than the average that the manager took to achieve their current seniority level. The average speed of promotion was calculated using information from the company human resource records on all R&D managers’ year of entry in Jupiter and year of attainment of their current seniority level. Since almost all R&D managers joining Jupiter soon after graduation and promotion from within was the norm, the speed of promotion is a reliable proxy of unobserved quality. We included both tenure and tenure squared, in years, to account for the possibility that innovative performance may increase with tenure up to a point, but might then peak and decline. We included a variable for changed career ladder, which is coded 1 if a manager had initially joined the technologist’s career ladder or 0 otherwise. Additionally, we
included a variable for whether a manager was from an acquired company.

Third, we controlled for other attributes and current responsibilities that could affect a manager’s performance ratings. We included a variable for gender, coded 1 for female and 0 for male. Next, we included a control for a manager’s level of intrinsic motivation. We used an 8-item scale of intrinsic and extrinsic motivation developed by Rynes et al. (2004) and, after factor analysis, included the 4-item factor for intrinsic motivation (Cronbach’s α=0.63). Managers’ abilities to achieve superior innovation performance might also vary depending on their responsibilities. We therefore included two dummy variables for largest product line responsibility (coded 1 if a manager worked for the largest product line within their division, or 0 otherwise) and non-product line responsibility (coded 1 if the manager did not work for a specific product line, or 0 otherwise), with the reference category being managers with responsibilities related to regular product lines. We also controlled for the number of people who reported directly or indirectly to the focal manager: number of direct and indirect reports. Finally, we included dummy variables for the division in which a manager currently worked, to control for other division characteristics that are not captured by the moderator variables.

RESULTS

Selection

Because our theorizing and main empirical analyses focus only on R&D managers who have worked in more than one division, we need to consider the possibility that our results might be vulnerable to selection bias arising from unobserved systematic differences between those who worked in more than one division and those who did not. For example, although Jupiter strongly encouraged its R&D employees to undertake assignments in different divisions, higher-performing individuals might have been more likely to take on this challenge while lower-
performing individuals might have preferred to stay within the same division.

To address this possibility, we first compared both the probability of achieving a top performance rating and the average speed to promotion for managers who had worked in only one division (n=105) and managers who had worked in more than one division (n=241); we found no statistically significant differences. We then formally tested for selection bias by estimating a two-stage selection model. In the first stage, we predicted the likelihood that a manager moved across divisions at least once (moved division, coded 1 if yes or 0 if no). As instrument, we used the size of the manager’s division in 2010, as measured by the total number of managers and technologists in the division (division size), because the R&D employees we interviewed suggested that individuals who worked in larger divisions might be less likely to move to other divisions since they had more opportunities to take on different roles within their division without moving. As shown in Model 1 in Table 1, this variable is a strong and significant predictor of the probability of moving division, supporting its validity as an instrument. From this first-stage probit model, we then derived the Inverse Mills’ Ratio, which we include in the second-stage probit model, Model 2, which predicts the probability of receiving a top performance rating. Model 2 shows that the size of the division does not predict top performance, further supporting the choice of this instrument. Since the coefficient of the Inverse Mills’ Ratio is also not significant in Model 2, we concluded that our main results are not affected by selection bias. We therefore proceeded to test our hypotheses without including the Inverse Mills’ Ratio in our main models.

----- INSERT TABLES 1 AND 2 ABOUT HERE -----

Main analysis

We tested the hypotheses using a logit specification, clustering the errors by seniority level to
account for potential correlation in the error terms due to the fact that performance ratings were assigned using a forced distribution within each seniority level. Descriptive statistics and correlations are available on request. Table 2 reports the coefficient estimates of the logit models. Model 1 shows that among the control variables, speed of promotion, intrinsic motivation, and number of direct and indirect reports are each positively and significantly related to the likelihood of top performance rating, while being more senior, from an acquired company, female, and responsible for the largest product line within a division are each negatively and significantly related to higher performance.

H1 predicted that an R&D manager’s performance will be stronger if their assignment portfolio is more concentrated in the current division. The positive and significant coefficient of the concentration variable in Models 2 and 4 (β=3.067, p<0.001 and β=2.952, p<0.001, respectively) support this hypothesis. H2 predicted that an R&D manager’s performance will be stronger if their portfolio of assignments is more coherent. We find support for this hypothesis too: the coefficient for the coherence variable is positive and significant in Models 3 and 4 (β=1.267, p<0.001 and β=0.962, p<0.05, respectively).

H3 predicted that the relationship between portfolio concentration and performance will be less positive in divisions with greater environmental uncertainty. To test this hypothesis, Models 5 and 6 include the interaction terms between the concentration variable and our measures of technological uncertainty and market uncertainty. Both interaction terms are significant (β=-2.706, p<0.01; β=-4.079, p<0.01). Figure 1A (1B) shows how the predicted probability of achieving a top rating is affected by an increase of technological uncertainty (market uncertainty) from one standard deviation below the mean to one standard deviation above the mean, keeping continuous variables at their mean values. As predicted, we find that
the performance benefits of greater concentration in the current division are lower at higher levels of technological uncertainty and market uncertainty.¹

H4 predicted that the relationship between portfolio coherence and performance will be less positive in divisions with greater environmental uncertainty. Models 7 and 8 include the interaction terms between the coherence of a manager’s assignment portfolio and the two environmental uncertainty variables. The interaction with technological uncertainty is significant ($\beta = -4.629, p<0.01$), but the interaction with market uncertainty is not significant. As illustrated in Figure 2A, the likelihood of obtaining a higher performance rating strongly increases with the level of coherence if technological uncertainty is low, whereas this positive relationship is weaker if technological uncertainty is high. So overall we find mixed support for H4: the performance benefit of a more coherent assignment portfolio is smaller in divisions with greater technological uncertainty, though not in divisions with greater market uncertainty.

H5 predicted that the relationship between portfolio concentration and performance will be less positive in divisions with greater operational slack. To test this prediction, Models 9 and 10 include the interaction terms between the concentration variable and the two operating slack variables. We find mixed support for the hypothesis: the interaction term for daily slack is negative and statistically significant ($\beta = -4.953, p<0.05$), while the interaction term for project slack is not significant. Figure 1C shows that the positive association between portfolio concentration and performance is weaker if the division is characterized by higher slack in daily work.

¹ Although not shown, we derived the confidence intervals of the difference between the predicted probability of a superior innovation rating when the moderator variable is “high” and “low” for each of the graphs in Figures 1 and 2, and found that the marginal effects are all statistically significant for the entire range of the moderated variables in all figures except for Figure 2C, where the marginal effect with project slack is significant for values greater than 0.1.
H6 predicted that the relationship between portfolio coherence and performance will be less positive in divisions with greater operational slack. Models 11 and 12 test this hypothesis by introducing the interaction terms between coherence and the two slack variables. Our results support this hypothesis: the interactions with both daily slack and project slack are negative and significant (β=-12.87, p<0.01; β=-32.41, p<0.05). Figures 2B and 2C show that the positive association between portfolio coherence and performance is weaker when slack is high relative to when it is low.

Model 12 reports the full model. All but one of the interaction terms that are statistically significant in the partial models are still significant in the full model; the weakened coefficient for the interaction effect between coherence and daily slack is likely due to multicollinearity arising from the fact that the coherence and concentration variables appear multiple times, which is evident in a VIF of well over 10.

Robustness

We performed three sets of robustness tests to assess the validity of our findings. First, we considered alternative operationalizations of the concentration and coherence measures. Second, we tested for the impact of outliers. Third, we examined whether our results are influenced by the number of assignments reported in our survey. The results of these robustness checks are largely consistent with our main results, the only notable difference is that the interaction between coherence and market uncertainty, which was not significant in our main results, is significant and negative in some of our additional analyses.

DISCUSSION

Many multi-divisional firms view moving their employees across divisions as a potentially
valuable way to develop managerial talent, yet we know little about the performance implications of such intra-firm mobility for these employees. Our study of mobility across divisions within a Fortune 500 firm reveals relationships between an R&D manager’s portfolio of assignments across divisions and the manager’s innovation performance that depend on the characteristics of those assignments (i.e., their concentration and coherence) and also on the characteristics of the manager’s current division (i.e., its environmental uncertainty and operational slack). These findings have implications for theories of intra-firm mobility and career choices as well as for our understanding of the micro-foundations of innovation in multi-divisional firms.

Management of Innovation in Multi-Divisional Firms

The traditional view of the multi-divisional firm theorizes that the “M-form” can provide efficiency advantages by enabling each division to specialize, separating strategic and operational decision-making, and increasing control and information flows relative to the external capital market (Armour & Teece, 1978). However, the extent to which the M-form facilitates innovation has long been contested. Some scholars have proposed that multi-divisional firms can benefit from their broad knowledge bases and rich assets pools, which enable them to transfer knowledge and learning across divisions (Kogut & Zander, 1992), and provide them with an advantage in scaling-up new products and processes to a wide range of markets (Burgelman & Grove, 2007). Others have highlighted the ability of multi-divisional firms to transfer capabilities between related divisions over time, and gain from inter-temporal economies of scope (Helfat & Eisenhardt, 2004). Yet it is also apparent that multi-divisional firms often struggle with routine and resource rigidities (Gilbert, 2005), and tend to have poor records of responding to, and taking advantage of, technological and market changes (Tripsas & Gavetti,
These rigidities are reflected in an overly procedural approach to the management of innovation, including use of complex stage-gates and restrictive accounting rules (Benner & Tushman, 2003).

In light of these tensions between the promise and the pitfalls of the M-form, much of the literature on strategic innovation management has highlighted macro-level structures and processes that can enable multi-divisional firms to be more successful at innovation, ranging from establishing ambidextrous formal structures (He & Wong, 2004), encouraging open innovation (Chesbrough, 2003), dedicated units for exploration (Benner & Tushman, 2003), taking options on a range of technological futures (McGrath, 1997), to undertaking alliances or mergers and acquisitions (Ahuja & Katila, 2001). However, this research has given much less attention to micro-level factors that may shape managers’ ability to contribute to innovation in such firms. Some scholars have suggested that R&D managers are able to achieve better innovation outcomes if they balance exploration and exploitation in their work activities (Gibson & Birkinshaw, 2004; Jansen et al., 2006). Meanwhile, studies have shown that R&D scientists can benefit from building boundary-spanning ties across divisions (Tortoriello & Krackhardt, 2010), engaging in external search (Dahlander, O'Mahony, & Gann, 2016; Salter, Ter Wal, Criscuolo, & Alexy, 2015), or visiting corporate headquarters to access resources for their projects (Choudhury, 2017).

Yet our understanding of how individuals within multi-divisional firms can perform innovation-related activities more effectively has not kept pace. Specifically, these studies do not consider the patterns of work assignments that may increase – or decrease – the effectiveness of R&D managers in their innovation roles. Our study of R&D managers’ innovation performance at Jupiter offers insight into this question by shedding light on the micro-foundations of
innovation within a large multi-divisional firm (Foss & Pedersen, 2014), and specifically by
drawing attention to the importance of R&D managers, who are responsible for managing the
innovation process within such firms. In particular, our study explicates the role of R&D
managers in the innovation process, and illuminates the assignment experiences that enable R&D
managers to perform more effectively in driving innovation for the firm. This focus on R&D
managers complements the much more extensive prior research on R&D scientists, helping to
advance research on the management of innovation.

**A Portfolio Perspective on Mobility**

For a multi-divisional firm, transferring employees across divisions is one way to address the
challenge of integrating its differentiated units (Lawrence & Lorsch, 1967). Transferring
employees across divisions helps to socialize them as members of the wider firm, facilitating
both coordination and control (Edström & Galbraith, 1977). It also helps the firm to realize the
potential synergies of holding multiple divisions within a single organizational entity by
facilitating learning from both mistakes and best practices across the firm’s divisions (Kogut &
Zander, 1992). The benefits of socialization and learning are particularly valuable for current and
future managers. However, mobility across divisions can also be costly for both the firm and its
employees. Firms have to invest substantial time, effort, and money in selecting employees to
assign to different divisions and in supporting them during their assignments, while employees
may face steep learning curves when they move and struggle to adjust to their new environments
(e.g. Bhaskar-Shrinivas et al., 2005; Black et al., 1999). Given these potential costs, both firms
and their employees could benefit from greater understanding of how choices about which
assignments to undertake, and for how long, can affect managerial performance.

While the foundations of much research on mobility within firms lie in theories of
internal labor markets and intra-firm vacancy chains (e.g. Althauser, 1989), prior studies of intra-firm mobility have rarely considered multiple assignments or how these assignments might relate to each other. Similarly, research on expatriate assignments in the international business literature tends to focus on single moves only (e.g. Shay & Baack, 2004). Such research also usually focuses on career-related outcomes such as hiring or promotions rather than on the performance implications of intra-firm mobility. By taking a portfolio perspective on mobility within firms, our study extends such research by showing that the characteristics of a manager’s set of assignments affect their performance, beyond simply whether or not they moved or the number of moves undertaken. R&D managers in the multi-divisional firm we studied performed more effectively if their assignments were characterized by greater concentration in the current division and by greater coherence across divisions. These results suggest that future research on intra-firm mobility can benefit from a portfolio perspective that considers the nature and duration of the assignments that individuals undertake and their implications for performance.

Some research on careers has gone beyond the effects of a single move to examine an individual’s accumulated set of experiences. However, the focus is usually on the benefits of specialization versus generalization for career-related outcomes such as hiring (e.g. Kacperczyk & Younkin, 2017; Leung, 2014), with very limited research on performance-related outcomes such as creativity (e.g. Godart, Maddux, Shipilov, & Galinsky, 2015). While some studies suggest that CEOs with international assignment experience tend to be more effective at managing multinational corporations (e.g. Carpenter, Sanders, & Gregersen, 2001), little of the research that considers multiple career experiences has focused on within-firm mobility, or has examined the fit between an individual’s experiences and the area in which the individual is currently working. An exception here is Ferguson and Hasan’s (2013) study of promotions
within the Indian Administrative Services, which showed that the fit between an officer’s specialized expertise and the requirements of their new roles was greater at later career stages. Our portfolio perspective draws attention to the importance of the fit between assignment experiences and the current work context, by showing that the performance implications of a manager’s assignment portfolio depend on the characteristics of the division in which the manager works. We find evidence that coherence across divisions and concentration in the current division were more beneficial for an R&D manager’s performance in contexts that favored exploitation, but less beneficial in contexts that favored exploration. These findings indicate that research on careers can be advanced by paying greater attention to the contingent effects of different mobility patterns for different outcomes in different contexts, rather than assuming that some patterns are always better than others.

Conclusion

This study has aimed to shed light on how intra-firm mobility affects the performance of managers in a multi-divisional firm. Our findings show that R&D managers whose assignment portfolios were more concentrated in their current division or more coherent across divisions delivered superior performance. However, the benefits of a more concentrated or coherent portfolio were reduced if the environmental uncertainty and operating context in the current division favored exploration over exploitation. Together, these findings demonstrate the value of a taking a portfolio perspective on mobility, and advance our understanding of the conditions that enable R&D managers to perform their innovation roles successfully.
<table>
<thead>
<tr>
<th></th>
<th>Selection (DV=Moved division)</th>
<th>Performance (DV=Top performance rating)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Division size</td>
<td>-0.00597***</td>
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</tr>
<tr>
<td></td>
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<td>(0.01)</td>
</tr>
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<td>Inverse Mills' ratio</td>
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<tr>
<td></td>
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<td>Coherence</td>
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<tr>
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<tr>
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<td>Technological uncertainty</td>
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<tr>
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<td>Market uncertainty</td>
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<tr>
<td></td>
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<td>(0.97)</td>
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<td>Daily slack</td>
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<td></td>
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<td>(0.46)</td>
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<tr>
<td>Project slack</td>
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<td>2.192***</td>
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<tr>
<td></td>
<td>(1.19)</td>
<td>(0.71)</td>
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</tr>
<tr>
<td></td>
<td></td>
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<td>Moves across divisions</td>
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<td>Total duration of</td>
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<tr>
<td>assignments</td>
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<td>(0.03)</td>
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<td>Changed career track</td>
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<td></td>
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<td>From acquired company</td>
<td>-1.318***</td>
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<tr>
<td></td>
<td>(0.36)</td>
<td>(1.53)</td>
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<tr>
<td>Gender</td>
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<td></td>
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<td>Intrinsic motivation</td>
<td>0.0196**</td>
<td>0.0681</td>
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<td></td>
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<td>(0.05)</td>
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<td>Largest product line</td>
<td>-0.161</td>
<td>-0.484***</td>
</tr>
<tr>
<td>responsibility</td>
<td>(0.18)</td>
<td>(0.07)</td>
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<td>Non-product line</td>
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<td>responsibility</td>
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<td>(0.11)</td>
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<td>Number of direct &amp;</td>
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<td>(1.63)</td>
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<tr>
<td>N</td>
<td>346</td>
<td>241</td>
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<tr>
<td>Log likelihood</td>
<td>-165.3</td>
<td>-124.4</td>
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Note: * Significant at p< .10; ** Significant at p< .05; *** Significant at p< .01.
Robust standard errors clustered by rank
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<td>0.136</td>
<td>0.542</td>
<td>0.512</td>
<td>0.682</td>
<td>0.588*</td>
<td>0.542</td>
<td>0.54</td>
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<td>0.451</td>
<td>0.651</td>
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<td></td>
<td>(0.34)</td>
<td>(0.42)</td>
<td>(0.37)</td>
<td>(0.41)</td>
<td>(0.41)</td>
<td>(0.47)</td>
<td>(0.36)</td>
<td>(0.41)</td>
<td>(0.42)</td>
<td>(0.45)</td>
<td>(0.38)</td>
<td>(0.47)</td>
<td>(0.43)</td>
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<tr>
<td>Moves across divisions</td>
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<td>-0.22</td>
<td>-0.218</td>
<td>-0.199</td>
<td>-0.288</td>
<td>-0.255</td>
<td>-0.214</td>
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<td>-0.221</td>
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<td>(0.27)</td>
<td>(0.24)</td>
<td>(0.29)</td>
<td>(0.24)</td>
<td>(0.21)</td>
<td>(0.27)</td>
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<td>(0.23)</td>
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<td>(0.22)</td>
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Note: * Significant at p< .10; ** Significant at p< .05; *** Significant at p< .01. Robust standard errors clustered by rank;
^ Log-ratio likelihood ratio test compares Models 2-4 to Model 1 and Models 5-12 to Model 4.
Figure 1: Moderating effects of environmental uncertainty and operating slack on the relationship between assignment portfolio concentration and probability of receiving top performance rating (y-axis)

Figure 2: Moderating effects of environmental uncertainty and operating slack on the relationship between assignment portfolio coherence and probability of receiving top performance rating (y-axis)
References


