People Management Skills, Senior Leadership Skills and the Peter Principle*

Yoko Asuyama
Institute of Developing Economies, Japan External Trade Organization (IDE-JETRO)
Yoko_Asuyama@ide.go.jp

Hideo Owan
Waseda University; RIETI
owan@waseda.jp

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Abstract

This paper investigates which managerial skills influence subordinate performance and how different types of skills are differentially rewarded within organization. Using comprehensive manager skill survey data from a management consulting company, we identify two manager skill types: people management skills (PMS) and senior leadership skills (SLS) with PMS being more essential for first-line positions and SLS more relevant for higher-level roles. We find that PMS, which enhances subordinates' performance and retention, is positively associated with managers' performance evaluation but not with promotion, whereas high SLS is strongly linked to promotion. Moreover, post-promotion performance is significantly correlated with pre-promotion SLS, but not with pre-promotion PMS. These findings suggest that the firm rewards PMS through performance-linked bonuses while adopting a competency-based promotion policy that advances managers with strong SLS, contrary to the prediction of the Peter Principle. We explain these patterns using a newly developed model in which firms balance managerial incentives and job assignment efficiency in designing their promotion policy.

***Keywords*:** manager, people management skills, Peter Principle, promotion, leadership

***JEL codes*:** J24, J63, M12 M50, M51

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1. Introduction

The nature of managerial work and the skills required vary across hierarchical levels primarily because middle management roles and their involvement in strategy formulation and implementation shift discontinuously across levels (Floyd and Wooldridge 1992, Wooldridge et al. 2008, Kaiser et al., 2011). Charan et al. (2011), for example, explain that as the scope and complexity of responsibilities expand—from supervising individual employees to building teams of capable managers or coordinating across functions—leaders must adapt their skills and focus accordingly. Similarly, Matsuo (2019) finds that promotion to executive roles entails a discontinuous unlearning process, involving shifts from short- to long-term decision-making, from directive to delegative motivation, and from direct to network-based information gathering. When the required skills change discontinuously with each promotion, the Peter Principle may arise: individuals who perform well at lower levels may be ill-suited to acquire the new skills needed for success at higher levels. Consequently, when promotions are used as incentives, matching efficiency may be compromised (Baker et al. 1988, Fairburn and Malcomson 2001). How, then, do firms avoid such allocative inefficiencies? How do they differentiate among managerial skills and use this information to both motivate effort and identify the right talent for senior positions?

The importance of managers in shaping worker productivity is well established. Studies using the value-added approach—which measures managers' impact on subordinates' productivity by estimating manager fixed effects (FE)—generally find that bosses substantially contribute to their subordinates' productivity (Lazear et al. 2015, Frederiksen et al. 2020, Adhvaryu et al. 2024, Fenizia 2022, Metcalfe et al. 2023). The literature has also scrutinized which managerial skills improve subordinates' productivity and job satisfaction. For example, using personnel data from UK retailers, Siebert and Zubanov (2010) show that commercial awareness is the most important evaluation criterion, with a 13.9% difference in store sales between store managers with and without this skill. Artz et al. (2017) find that managers with stronger technical skills are associated with greater subordinates' job

satisfaction, as these skills enable them to provide more relevant advice. Using U.S. Army personnel data, Lyle and Smith (2014) and Carter et al. (2019) demonstrate that officers working for highly competent supervisors with strong leadership have higher promotion probabilities and significantly lower turnover rates. Kuroda and Yamamoto (2018) find that subordinates working under supervisors who are highly valued for their communication skills report better mental health. Hoffman and Tadelis (2021) develop an index of supervisors' ability to manage subordinates based on an employee survey and show that people management skills significantly increase retention rates but do not affect subordinates' personnel evaluations, salaries, or promotions. Through a laboratory experiment, Weidmann et al. (2024) find that team performance is higher when managers are selected based on economic decision-making skills (skills for efficient resource allocation) and fluid intelligence.

Unfortunately, few studies examine how managers' skills are rewarded when recognized by senior management, and their findings are not consistent. Hoffman and Tadelis (2021) show that managers with strong people management skills receive higher subjective performance ratings, higher promotion rates, and larger salary increases. In contrast, Siebert and Zubanov (2010) find that managers with higher commercial awareness do not necessarily receive higher pay, concluding that the skills are company-specific. Campbell (2008), using job assignment records of managers from a U.S. fast-food retailer, finds that promotion or demotion decisions are sensitive to nonfinancial performance measures –such as customer survey–based service quality and employee retention—suggesting that managerial efforts that improve these outcomes are incentivized, or that the underlying skills serve as indicators of expected future performance at higher levels. However, none of these studies examine a broad set of managerial skills whose importance may vary across job levels, nor do they assess how such skills are rewarded through incentive pay or promotion.

This study seeks to address this gap in the literature. Drawing on detailed measures of managerial skills, we examine which skills influence subordinate performance and how different types of skills are differentially rewarded. Our analysis uses personnel data from a Japanese management

consulting firm, which includes upward and downward feedback on 40 skill items for managers, evaluated by both subordinates and supervisors. [1] By estimating models with fixed effects for both subordinates and managers, we identify the impact of specific managerial skills on subordinate outcomes as well as their role in managers' performance evaluations and promotions. In doing so, we provide new evidence on corporate incentive and promotion mechanisms.

Our results are summarized as follows: we identify two distinct sets of skills—people management skills (PMS) and senior leadership skills (SLS). SLS include skills for performance management, coordination, and market awareness. We show that (1) only managers' PMS observed by their subordinates (PMS upward) positively predict subordinates' performance; (2) PMS observed by their superiors (PMS downward) are not related to the outcomes of both subordinates and managers; (3) managers' PMS upward also predicts subordinate retention; (4) while managers' PMS upward predict their own performance evaluations, they are not correlated with promotions; (5) managers with high SLS tend to be promoted; and (6) managers who were perceived to have high SLS before promotion tend to perform better after promotion whereas those who were perceived to have high PMS before promotion do not.

These findings, along with additional evidence, suggest that PMS are crucial for first-line managers but less relevant for senior-level managers, whereas SLS play a more important role in higher-level positions. Moreover, results (4) and (5) indicate that the firm rewards PMS through performance-linked bonuses while adopting a competency-based promotion policy that advances managers with strong SLS. Taken together, the evidence implies that the Peter Principle, as discussed in the classic anecdotes of Peter and Hull (1969), may be less prevalent—particularly among middle managers or in contemporary organizations where various skill-assessment technologies are available. Only a few rigorous empirical studies have investigated the Peter Principle using employee-level data within firms.

[1] Our managers' skills include various interpersonal skills. Thus, our study contributes to the labor economics literature, which increasingly emphasizes the importance of social or interpersonal skills in explaining productivity and income heterogeneity, by showing how those skills affect the managers' career (Deming 2017, Hansen et al. 2021).

Notable exceptions include Grabner and Moers (2013) and Benson et al. (2019), who examine the promotion of non-management employees and report results consistent with the Peter Principle. The limited evidence to date makes it difficult to identify the conditions under which the phenomenon arises.[2]

To advance this inquiry, we develop a theoretical model in which the firm employs both pay-for-performance and promotion to balance the dual objectives of motivating employee effort and achieving efficient job assignment. The model predicts the conditions under which a firm is likely to adopt performance-based versus competency-based promotion. Specifically, performance-based promotions are more likely when: (1) the skills required for upper-level jobs are strongly correlated with those required at lower levels, (2) signals of upper-level skills are imprecise, and/or (3) the cost of effort in lower-level jobs is sufficiently high. Evaluating plausible parameter values for the focal firm allows us to interpret its adoption of competency-based promotions.

The remainder of this paper is organized as follows. Section 2 describes our dataset and key variables. Section 3 presents our empirical strategy. Sections 4 and 5 provide the baseline empirical results and robustness checks, respectively. Section 6 presents a theoretical framework for interpreting the results. Section 7 concludes.

[2] The phenomenon is also called the Baker-Jensen-Murphy puzzle—why do so many firms use promotion-based incentive systems despite the fact that they are generally found to be inefficient (Baker et al. 1988, Fairburn and Malcomson 2001). A number of studies attempt to offer potential explanations (Gibbons and Waldman 1999). One is the simple argument that suggests no alternatives exist for promotion when worker output is unverifiable due to holdup problems or worker incentives to bribe managers (Malcomson 1984, Prendergast 1993, Fairburn and Malcomson 2001). Another widely accepted reason is that promotions are not designed to provide incentives, but rather are giving incentives through the signaling effects of promotions, regardless of whether or not the incentive effects are intended (Waldman 1984, Zabojnik and Bernhardt 2001, Ekinci et al. 2019). However, signaling theory leads to inefficient job assignment in the form of under-promotion, and over-promotion—promoting the unqualified, as seen in the Peter Principle—is not predicted.

2. Data

2.1 Overview of the Dataset

We use personnel records from a Japanese management consulting company, including its group companies. These group companies primary operate in career education, job matching and temporary staffing businesses. Our dataset contains semiannual records of upward and downward feedback for middle managers from May 2015 and May 2020. It also contains performance evaluation records and basic employee characteristics for all employees during the periods. The company employs approximately 1,400 people on average during this period.

2.2 Upward and Downward Feedback for Middle Managers' Skills

Every May and November, each middle manager's superiors and subordinates are given a detailed survey of the manager's management skills, the results of which are fed back to the manager. We call superiors' responses "downward feedback" and subordinates' responses "upward feedback." The purpose of the survey is to cultivate managers' skills, and its results are not linked directly to managers' performance evaluations. Managers evaluated in the survey are, in principle, middle managers, excluding executives and top management of group companies.

In every survey, the superiors or subordinates are asked 40 questions about each manager they work with. Both surveys ask about various management skills, including performance management, judgment, coordination, subordinates' management, and reporting/communicating information about market or firm/team situations, although the specific questions differ between the superiors and subordinates due to their different interaction with the manager. For each question, the superiors or subordinates answer their satisfaction level on a 5-point scale. We only have access to average scores for each question and each manager. This is also the unit fed back to managers.[3]

[3] For each manager, the number of superiors and subordinates answering the survey is 1–3 and 1–20 persons, respectively. When only one subordinate answers the survey, the results are not fed back to the manager (but included in our dataset).

To utilize all survey items comprehensively while reducing the dimensions of managers' skills, we perform an explanatory factor analysis (EFA) on the entire 80 standardized average scores based on 954 observations of 191 managers. We apply the principal factor method with quartimin oblique rotation, which is one of the most common EFA methods (Costello and Osborne 2005).[4] We extract six factors based on (i) a scree plot indicating four to six factors, (ii) the traditional Kaiser's rule recommending retaining seven factors with an eigenvalue greater than one, and (iii) a meaningful interpretation of each factor. Appendix Table B1 reports factor loadings of the 80 items.

We interpret the six factors as follows (with their variable names in parenthesis): The first factor represents PMS (upward) mainly reported by subordinates (*PMS_Up*). Although subordinates evaluate managers' skills from various perspectives, all 40 responses are strongly correlated and have the highest factor loadings on the first factor (Appendix Table B1), presumably due to the halo effect (Thorndike 1920). Following Hoffman and Tadelis (2021), we call this first factor PMS upward because these skills are evaluated by subordinates and mainly represent the skills of managing subordinates. More specifically, our PMS upward represents subordinates' evaluation of overall manager skills that cover communicating market situations or firm/team visions and goals; understanding and assessing the situations and challenges of team/subordinates; coaching, guiding, supporting, and delegating work to subordinates to enhance their motivation and growth; and making appropriate judgements.

Each of the superiors' 40 responses has the highest factor loadings on one of the remaining factors. The second factor stands for performance management skills (*PerformMgmt*), which has the highest factor loadings on skills for managing workflow, progress, quality and pursuing short-term results. The third factor is coordination skills (*Coordination*), which include skills for coordination and cooperation with other work units and stakeholders and thinking/acting from a company-wide perspective. The fourth factor represents market awareness (*MktAwareness*), which are skills for

[4] Quartimin oblique rotation, which is used in studies such as Heckman et al. (2013) and allows the correlations among factors, is appropriate when considering the possible correlations among various management skills.

recognizing, assessing, and reporting the situations of external environment such as customers, competitors, the market, and the industry. The fifth factor is team assessment and reporting skills (*TeamAssessment*), which are skills for assessing and reporting the workplace situations and challenges. Finally, the sixth factor can be interpreted as PMS (downward) mainly reported by superiors (*PMS_Down*). It represents superiors' evaluation of managers' subordinate management skills including understanding, supporting, coaching, and delegating work to subordinates. Interestingly, PMS upward reported by subordinates and PMS downward reported by superiors are not highly correlated. As Table 1 shows, their correlation coefficient is 0.236.[5] Although we cannot disclose the detailed contents of all survey items at the company's request, we list ten representative question items in Table 2.

We classify *PMS_Up* and *PMS_Down* as people management skills (PMS), and *PerformMgmt*, *Coordination*, and *MktAwareness* as senior leadership skills (SLS), which are considered more essential for senior-level managers. The aggregate SLS index is computed as the average of *PerformMgmt*, *Coordination*, and *MktAwareness*. Because the remaining *TeamAssessment* represents basic team skills required for most white-collar workers, it is hard to interpret it as either part of PMS or SLS. Thus, we treat it as a control variable in the main analysis.

In the manager skill survey, the company also collects 5-point scale expectation scores, representing the skill levels expected of managers in their respective positions, for the same 80 skill items. Using this standardized information, panel (a) of Figure 1 shows that relatively senior-level managers are expected to demonstrate more of these SLS in this company. In Figure 1, senior-level managers are defined as those with the second-highest job level (among the company's seven broad job levels), which mostly includes department head, whereas lower-level managers are defined as those with the third- and fourth-highest job levels, mostly including unit manager, area or branch manager, group manager, and manager. Panel (b) of Figure 1, which reports the satisfaction scores (i.e., our main manager skill variables), also shows that these senior managers actually demonstrate higher SLS (and

[5] To compute factor scores, the regression scoring method, which provides the highest correlation between the estimated factors and factor scores (DiStefano et al. 2009), is applied.

its components, *PerformMgmt*, *Coordination*, and *MktAwareness*).

Previous research suggests that required skills vary depending on the manager's level (Charan et al. 2011, Kaiser et al. 2011, Matsuo 2019). These studies indicate that managers at higher levels need to balance short-term goals with long-term company-wide profitability; assess external environment and link it to their business; and analyze more complex information. All of these skills are covered by our SLS measure derived from *PerformMgmt*, *Coordination*, and *MktAwareness*.

All manager skill variables (six factor scores and the SLS score) are standardized to have a 0 mean and a standard deviation (SD) of 1 based on all available observations. Appendix Figure B1 shows most skill variables are normally distributed.

2.3 Outcome Measures for Subordinates and Managers

We examine the following three outcome measures[6]:

- **Performance evaluation** (*Eval, EvalA*, *EvalSG*): The company conducts quarterly performance evaluation of all employees (in every January, April, July, and October). We primarily analyze the overall evaluation score (*Eval*), which is the sum of the achievement evaluation *(EvalA*) and stretch goal evaluation (*EvalSG*) scores. *EvalA* assesses the attainment rate of objective performance targets such as sales goals. The targets are primarily individual goals for subordinates and team goals for managers. *EvalSG* evaluates the degree of achievement in personal competency development targets, such as planning capabilities.

  Both *EvalA* and *EvalSG* are rated on a 1–9 scale (with 5 representing the expected achievement), making the overall evaluation (*Eval*) ranges from 2 to 18. The evaluator is the direct superior; however, the evaluation scores are adjusted through the discussions with other evaluators and the head of the same department to ensure fairness and objectivity. Although *EvalA* is more objective than *EvalSG*, we use *Eval* as the main outcome performance measure, because *Eval* is

[6] Compensation data are not accessible.

the one reflected in performance-based pay such as bonus. We use performance evaluations conducted every January and July, which are administered two months after the manager skill survey conducted in November and May, respectively.

- **Retention** (*Retention*): Preventing subordinates from quitting is an important job for managers because employee turnover is costly for firms. Thus, we examine *Retention*, which is a binary variable that takes the value of 1 if the subordinate continues working at the company and 0 if (s)he has quit during the six months after the manger skill survey.
- **Promotion** (*PromoteJT*): The company has seven broad job levels: (i) board member, (ii) executive officer, top executives of group companies, department head etc., (iii) unit manager, area or branch manager etc., (iv) group manager, manager, sales manager etc., (v) group leader etc., (vi) special administrator etc., and (vii) ordinal employees. Positions at level (iii) and higher and part of level (iv) are classified as managerial in general. We examine managers' promotions using *PromoteJT*, a binary variable equal to 1 if a manager is promoted to a higher job level within six months after the manager skill survey, and 0 otherwise.[7]

Figure 2 plots manager performance (*y*-axis) against manager skills (*x*-axis). Each data point represents the averages of *y*-axis and x-axis variables for each decile group of managers, which is created based on the *x*-axis manager skill. The left three charts show that managers' skill scores (PMS upward, PMS downward, and SLS) are all positively correlated with manager's performance evaluation that reflects team performance, although PMS downward shows a much weaker correlation. The right three charts display promotion on the *y*-axis and indicate a positive association across all three scores. However, SLS exhibits the highest positive correlation, as reflected in the steepest regression line slope, suggesting that promotion decisions may depend more on SLS.

[7] Returning to a previous level after a demotion is not considered a promotion. Promotion opportunities exist in both periods following the semiannual manager skill surveys.

2.4 Other Variables and Summary Statistics

We also utilize various employee characteristic information, which includes gender, age, tenure, whether hired as new graduates or mid-career, employment type, job grade, job level, group firm or detailed work unit affiliation, and work unit size (number of employees affiliated with the unit the manager supervises). Table 3 reports the summary statistics of our estimation sample when the outcome is overall performance evaluation (*Eval*). We analyze an unbalanced panel of 1390 subordinates supervised by 187 managers over 11 periods when analyzing the subordinate sample and that of 182 managers when analyzing the manager sample. Subordinates experience an average of 2.24 managers. In total, 89 superiors of 187 managers report downward feedback.

3. Empirical Strategy

We first analyze which manager skills are associated with subordinates' performance (Section 3.1), and then examine which manager skills are rewarded with managers' own performance evaluations (and thus performance-based pay that reflects them) and promotions (Section 3.2). If skills that improve subordinate performance of the current team correlate positively with the manager promotions, it suggests that pre-promotion performance is the primary determinant of a manager's promotion. Conversely, if skills considered more important for higher positions strongly correlate with promotions, it implies that competency, rather than past performance, drives promotion decisions.

3.1 Subordinate Sample

We use longitudinal data to explore what manager m's skills $\mathbf{MS}_{m(i,t)}$ (measured through upward and downward feedback) are associated with subordinate i's performance $Y_{i,t+1}$—performance evaluation (*Eval*, *EvalA*, or *EvalSG*) and retention (*Retention*). We estimate the following equations with or without manager fixed effects (FE):

$$Y_{i,t+1} = \mathbf{MS}_{m(i,t)}\beta + \mathbf{X}_{it}\gamma + \eta_t + \theta_i + \varepsilon_{it} \quad (1)$$

$$Y_{i,t+1} = \mathbf{MS}_{m(i,t)}\beta + \mathbf{X}_{it}\gamma + \eta_t + \theta_i + \psi_{m(i,t)} + \varepsilon_{it} \quad (2)$$

where i is a subordinate and t is one of the 11 period (every May and November from May 2015 to May 2020). η_t is the period fixed effects. $m(i, t)$ is the manager who supervises i at t. θ_i is the subordinate effect that captures the time-invariant productivity and ability of i. $\psi_{m(i,t)}$ is the manager effect that captures time-invariant manager components, including various management skills and leniency in rating subordinates' performance evaluation. Note that the correlation between $\mathbf{MS}_{m(i,t)}$ (or $\psi_{m(i,t)}$) and θ_i, which includes a tendency to assign a higher-skill manager to higher-ability subordinates, does not bias our estimates of β.

For $\mathbf{MS}_{m(i,t)}$, we use two specifications: (1) all five factor scores for manager skills representing PMS and SLS; and (2) aggregated three scores, that is, PMS reported by subordinates (*PMS_Up*), PMS reported by superiors (*PMS_Down*) and the aggregated SLS score (see Section 2.2).

$\mathbf{X}_{it}$ is a vector of control variables, including age (quadratic), tenure (quadratic), employment types[8], job grades, job levels, work unit size, and group firm affiliation dummies[9]. The vector also includes manager characteristics, such as gender, age, tenure, employment types, job grades, job levels, and concurrent post dummy. Team assessment and reporting skills (standardized fifth factor score) is also added to $\mathbf{X}_{it}$. In some specifications, detailed work unit affiliation dummies are controlled for instead of group firm affiliation dummies. ε_{it} is the error term.

3.2 Manager Sample

To examine how manager m's skills ($\mathbf{MS}_{mt}$) are rewarded, we estimate the following equations with or without manager FE or superior FE, where $Y_{m,t+1}$ is manager's own performance

[8] There are six employment types defined by the company: (i) a general career-track type (*sogo-shoku*, in Japanese) without restrictions on office location, occupation, or tasks, (ii) a location-restricted type, (iii) an occupation-restricted type, (iv) a task-restricted type, (v) contract employees, and (vi) a type with no specific designation.

[9] There are 15 group companies (including the main management consulting company) in this firm. As explained in Section 2.1, most group companies engage in career education services and recruitment and temporary staffing businesses.

evaluation (*Eval*, *EvalA*, or *EvalSG*) or promotion in terms of job levels (*PromoteJT*):

$$Y_{m,t+1} = \mathbf{MS}_{mt}\beta + \mathbf{X}_{mt}\gamma + \eta_t + \varepsilon_{mt} \quad (3)$$

$$Y_{m,t+1} = \mathbf{MS}_{mt}\beta + \mathbf{X}_{mt}\gamma + \eta_t + \xi_{e(m)} + \varepsilon_{mt} \quad (4)$$

$$Y_{m,t+1} = \mathbf{MS}_{mt}\beta + \mathbf{X}_{mt}\gamma + \eta_t + \psi_m + \varepsilon_{mt} \quad (5)$$

$$Y_{m,t+1} = \mathbf{MS}_{mt}\beta + \mathbf{X}_{mt}\gamma + \eta_t + \psi_m + \xi_{e(m)} + \varepsilon_{mt} \quad (6)$$

where m is the manager, $e(m)$ is the superior who evaluates the manager's skill in t (and performance in t+1 in general), and ψ_m and $\xi_{e(m)}$ are the manager FE and the superior FE, respectively. We examine the same two specifications for $\mathbf{MS}_{mt}$ as in the subordinate sample. $\mathbf{X}_{it}$ is a vector of manager characteristics, including gender, age (quadratic), tenure (quadratic), employment types, job grades, job levels, work unit size, group firm affiliation dummies, as well as team assessment and reporting skills. The superior FE is added in equations (4) and (6) in order to control for superior-specific evaluation tendencies and response likelihood to the manager skill survey. Of the survey-targeted managers, 88% actually have skill evaluation data. According to the company, the reason for missing skill evaluation data is mainly due to the superiors' circumstances, and not due to those of managers, including their performance and skills. Such sample selection can be addressed by controlling for superior dummies.

4. Baseline Results

4.1 Which Manager Skills Are Relevant for Subordinates' Performance?

Table 4 reports the relationships between manager skills and subordinates' overall performance evaluation (*Eval*) and retention (*Retention*). Columns (1) and (2) estimate equation (1) without manager FE, whereas columns (3) and (4) estimate equation (2) with manager FE. Columns (2) and (4) control for detailed work unit affiliation dummies instead of group firm affiliation dummies. We mainly focus on the results in columns (2) and (4) with work unit FE, which analyze skill change effects within the same work unit, because the role assigned to the work unit is a major confounding factor affecting both manager assignment and employee performance. However, the results are mostly

similar across all columns.

PMS upward: Only PMS upward (*PMS_Up*) largely reflecting reports from subordinates is a significant positive predictor of subordinates' overall performance evaluation (*Eval*). However, this effect is small: a one SD increase in PMS upward improves subordinate's *Eval* by 0.06–0.08, whereas the mean and SD of *Eval* are 9.575 and 0.896, respectively (Table 3). This means that managers' PMS explain at most 10% of the entire variation in subordinates' performance. PMS upward is also positively related to subordinates' retention. However, the relationship is only weakly significant when detailed work unit dummies are controlled for. In this case, PMS upward increases subordinate's retention rate by 1.4–1.6% points, while subordinate's mean turnover rate is 6.1%.

The most likely reason behind the small or weak positive correlation between PMS upward and subordinates' performance and retention is that the effects of PMS may need time to show up. Namely, supervisors' greater coaching and guiding skills might not immediately alter subordinate performance or job retention intentions. Table 5 shows that this is indeed the case. In this table, the "Same M sample" results are based on subordinates who are under the same manager for at least 2 periods (*i.e.,*12 months), whereas the "Different M sample" results are based on the remaining subordinates. The results show that PMS upward correlates 1.5–2.5 times as strongly with subordinates' overall performance evaluation in the "Same M sample" compared to the entire sample, and now significantly positively correlates with subordinate retention in the "Same M sample". A one SD increase in PMS upward raises subordinate performance evaluation by 0.12–0.14 and increases retention rate by 2.7–3.6% points, equivalent to a 44–59% reduction in mean turnover rate.[10]

PMS downward: PMS reported by superiors (*PMS_Down*) has no relationships with subordinates' performance evaluation and retention rate (Table 4), indicating that superiors poorly

[10] Hoffman and Tadelis (2021) calculate that changing a manager from the 10th percentile of PMS to the 90th percentile reduces subordinates' turnover rate by approximately 60%, based on the main IV estimation using a high-tech firm employee sample. A similar calculation using our "Same M sample" shows that increasing a manager's PMS from the 10th to the 90th percentile is associated with an 72-86% reduction in subordinate turnover.

observe manager's subordinate management skills.

SLS: SLS, primarily reported by superiors, is a significant negative predictor of subordinates' performance evaluations, although its effect is small again (Table 4). In particular, market awareness (*MktAwareness*), which mainly include skills for recognizing, assessing, and reporting the situations of customers, competitors, the market, and the industry, drive this negative association.

Two interpretations are possible for this counterintuitive result. The first is reverse causality. Market awareness skills become particularly crucial when business demand starts declining and the firm needs to change its strategy quickly in response. Consequently, superiors may recognize such skills especially when team performance is sluggish. This endogeneity issue is discussed later in the robustness checks section. Second, managers with greater *MktAwareness* might engage more in player duties (i.e., selling/consulting activities for their clients and micro decision-making in daily operations), providing them with more market-related information to share with senior managers. However, subordinates under such "playing" managers assume fewer responsibility and have limited skill development opportunities. *MktAwareness* is also a negative predictor of subordinate retention rate, which is consistent with both interpretations. Namely, subordinates are more likely to quit when the department's business environment is sluggish and those under "playing" managers are likely to seek better growth opportunities elsewhere.

In contrast, SLS as a whole is not a negative predictor of retention, and one of its components, coordination skills (*Coordination*), positively predict subordinates' retention (Table 4). Managers with high *Coordination* can think and act from a company-wide perspective and collaborate effectively with various stakeholders. Such managers may be perceived as role models, potentially reducing subordinate turnovers. Another possibility is that subordinates under high-*Coordination* managers stay on the job to "ride the winning horse," hoping their manager will be promoted to a more senior position. However, these relationships prove less robust when splitting the sample (Table 5) and in subsequent robustness analyses reported in Section 5.

Appendix Table B2 replaces the performance evaluation in Table 4 with achievement and stretch goal evaluation, both of which yield broadly similar results, albeit with less significant coefficients of managerial skills.

4.2 How Are Managers' Skills Evaluated and Rewarded?

The previous section has demonstrated that manager's PMS upward positively predicts subordinates' performance of the current team in terms of both performance evaluation and retention. We now investigate how these skills are rewarded, specifically examining which skills between PMS and SLS predict managers' promotions. The results will reveal whether managers' promotion to senior positions is based on performance or competency.

Table 6 reports the relationships between manager skills and own performance indicators, overall performance evaluation (*Eval*) and promotion (*PromoteJT*), after controlling for various manager characteristics. Columns (1)-(4) estimate equations (3)-(6), respectively, and the difference between them is the presence or absence of manager FE and superior FE. Results for achievement and stretch goal evaluation are reported in Appendix Table B3.

Performance Evaluation: PMS upward (*PMS_Up*) is significantly positively correlated with manager's performance evaluation (in terms of both achievement and stretch goal evaluations). A one SD increase in PMS upward is associated with a 0.21−0.25 increase in overall performance evaluation (*Eval*), whereas the mean and SD of *Eval* are 9.224 and 1.077, respectively (Table 3). These positive associations are not surprising because manager's higher PMS upward increases subordinates' performance evaluation score (Tables 4, B2), resulting in higher team performance, which is strongly linked to managers' performance evaluation. In contrast, PMS reported by superiors (*PMS_Down*) are not related to managers' performance evaluation.

The aggregated measure of SLS, mainly observed by superiors, is not associated with performance evaluation, particularly when manager FE are included. However, among SLS,

performance management skills (*PerformMgmt*), which involve skills for managing workflow, progress, and quality, and pursuing short-term results, are positively rewarded and have similar impacts as those of PMS upward. As managers' performance evaluation is strongly linked with their team performance, it is natural that *PerformMgmt* positively predicts the evaluation score. Other SLS, including coordination (*Coordination*) and market awareness (*MktAwareness*), are mostly negatively associated with manager's performance evaluation, although they are all statistically insignificant.

Promotion: Regarding promotions, most coefficients are insignificant when manager FE are controlled for. However, this is expected, because the skill evaluations are noisy and promotions are based on cumulative evaluations over time, not short-term skill improvements. Kahn and Lange (2014) show that the difference between wages and actual productivity is substantial because firms continuously struggle to learn about worker productivity, which evolves throughout the life cycle. Also to be noted is that since promotion decisions are made based on relative standing, as suggested by tournament theory (Lazear and Rosen 1981), managers with higher competence than their peers in the same period are promoted. Therefore, variations in skills among peers, such as those within the same group firm, are important. For this reason, in columns (1) and (2), which are our preferred specification, group firm affiliations are controlled for. Unlike the results of performance evaluations, PMS upward is not rewarded with promotion. In contrast, SLS, coordination (and performance management) skills in particular, increase managers' promotion probability. A one SD increase in SLS improves the promotion probability by 2.4−3.6% points, whereas the manager's mean promotion rate is 7.5% (Table 3).

4.3 Is the Peter Principle Phenomenon Observed?

Figure 1 suggests that SLS and its components—performance management, coordination, and market awareness—are necessary skills particularly for senior managers. We also examine whether promoting managers with higher SLS actually leads to better performance after promotion. In Table 7,

the performance evaluation scores of promoted managers, evaluated either 8-13 or 14-19 months after promotion, are regressed on manager skills just before promotion.[11] To account for selection into promotion, we also estimate a Heckman two-step selection model (Heckman 1979): In the first stage, the promotion dummy is regressed on pre-promotion manager skills (and control variables including age and the 2018-2020 period dummy)[12] and the exclusion restriction variable *Z*, which is the number of managers in the next higher position at the same time (excluding those who were just promoted). We assume that more slots for higher positions (higher *Z*) are positively associated with promotion probability but not directly associated with the performance of promoted managers. In the second stage, the performance evaluation scores of promoted managers are regressed on pre-promotion manager skills (and the same control variables as in the first stage) and the inverse Mill's ratio (IMR) estimated from the first stage.

Table 7 first shows that sample selection is suspected only when performance evaluation 8-13 months after promotion is regressed with no controls, in which the IMR coefficient is statistically significant (column 2). For other specifications, we can rely on the OLS results. The results show that pre-promotion SLS tends to positively predict post-promotion manager performance, although the coefficients of SLS components (performance management and market awareness, in particular) are mostly positive but statistically insignificant, partly due to the limited number of managers experiencing promotion. By contrast, higher PMS upward before promotion is always unrelated to post-promotion performance. In addition, the magnitude of its coefficient is mostly much smaller than those of SLS and its components.

Although the small sample size of promoted managers with skill scores is a limitation of our

[11] When promotion occurs during the 6 months between (t -1) and t, we examine the performance evaluation score at 2 months after t +1 (= 8 months after t = 8-13 months after promotion), and 2 months after t +2 (=14 months after t = 14-19 months after promotion).

[12] Due to the small sample size of promoted managers with skill scores, we only control for variables that tend to be statistically significant, namely age and the 2018-2020 period dummy. The 2018-2020 period dummy is used because senior managers tend to receive lower performance evaluation scores during 2018-2020 than in the previous period.

study, the results in this section suggest that promotion decisions are not distorted by the need to encourage frontline managers to be good bosses (i.e., those with high PMS upward). In this company, we observe competency (SLS)-based promotion, not the performance (PMS)-based promotion predicted by the Peter Principle, which prioritizes current job performance over competency relevant to higher-level positions.

5. Endogeneity and Alternative Interpretations

Although our baseline estimates of manager skill effects—controlling for both subordinate and manager fixed effects—represent a novel contribution relative to previous studies, they still fall short of establishing internal validity. This section addresses endogeneity problems and alternative interpretations for both subordinates' and managers' performance regressions. Regarding subordinates' performance regression, as noted in Section 3.1, the correlation between $\mathbf{MS}_{m(i,t)}$ (or $\psi_{m(i,t)}$) and θ_i in equations (1) or (2), which includes a tendency to assign a higher-skill manager to higher-ability subordinates, does not bias our estimates of β (the coefficient of $\mathbf{MS}_{m(i,t)}$). However, β becomes biased if $\mathbf{MS}_{m(i,t)}$ and the error term ε_{it} are correlated even after purging the effects of θ_i (and $\psi_{m(i,t)}$). Such correlation can arise when (i) ε_{it} includes a manager-subordinate match-specific component, (ii) certain trends or shocks included in ε_{it} correlate with $\mathbf{MS}_{m(i,t)}$, and (iii) measurement errors exist in $\mathbf{MS}_{m(i,t)}$. Sections 5.1 and 5.2 present additional tests addressing cases (i) and (ii), respectively. Measurement errors (case iii) lead to attenuation bias, implying that the absolute effect sizes in our baseline estimations are downward biased.

5.1 Are the Results Driven by Match Quality?

To address bias from manager–subordinate match-specific components, which may reflect their compatibility or collusive relationship (case i), we estimate equation (2) by replacing subordinate FE and manager FE with subordinate×manager FE. Note that this treatment may mitigate bias but could

weaken the estimated relationship because β is identified only through manager skill variations within the same manager-subordinate match. However, the results in Appendix Table B4 show mostly similarities to our baseline results for performance evaluation regressions.

5.2 Are the Results Driven by Biases due to Manager Selection or Reverse Causality?

Regarding the bias due to non-random manager assignment (one typical example of case ii), we examine whether managers with a growing $\mathbf{MS}_{m(i,t)}$ are more likely to be assigned to subordinates with positive (or negative) productivity shocks or trends. Following Hoffman and Tadelis (2021), we regress subordinate *i*'s performance evaluation on skills of the future manager who is not *i*'s current manager but will be assigned to *i* in the next period. Subordinate FE, future manager FE, and the time-variant control variables of subordinate and current manager, as in Tables 4 or B2, are also included. Appendix Table B5 results suggest that managers with increased SLS (*MktAwareness*, in particular) or *PMS_Down* may be assigned to subordinates experiencing positive productivity shocks.[13] This indicates that the estimated coefficients of these variables in our baseline results (Table 4) are likely to be upward biased. However, because these coefficients in Table 4 are negative, it suggests that our baseline results underestimate the negative effects of *MktAwareness* (and consequently SLS) and *PMS_Down*.

Another typical example of case (ii) is reverse causality from poor performance due to sluggish demand to manager skills (e.g., market awareness), as mentioned in Section 4.1. We address this by controlling for business demand, proxied by interaction terms between 11 period dummies and six business area dummies.[14] The results in Appendix Table B6 demonstrate that the positive associations between *PMS_Up* and performance evaluation, and those between *Coordination* and

[13] Note that we cannot examine subordinate retention because if subordinate *i* quits by time *t*, no manager is assigned to *i* at time (*t*+1). The timing of the performance evaluation variable is seven months before the first match between manager and subordinate, whereas the timing of time-variant manager skills and other control variables is six months before the first match.

[14] According to the company, the 15 group firms are classified into six business areas such as consulting, career education, job matching and temporary staffing (details omitted to ensure company anonymity).

retention in baseline results (Table 4), remain robust. Importantly, the negative coefficients of *MktAwareness* become insignificant in most specifications.

We believe that Sections 5.1-5.2 sufficiently address the remaining endogeneity issues. [15]

5.3 Do the Results Reflect Non-Random Assignment of Tasks?

Sections 5.3-5.4 examine managers' performance regressions. This subsection addresses another endogeneity problem—the potential nonrandom assignment of tasks to managers, which may bias the results. For instance, superiors may not assign SLS-required tasks to managers who lack promotion desire or whom superiors do not intend to promote. This could result in lower SLS scores for these managers. Considering this possibility, we control for the expectation score for each manager skill variable, assuming high correlation between skills required by the actually-assigned tasks and the skills expected to be demonstrated. The results in Appendix Table B7 show that the baseline results in Table 6 are mostly robust and unaffected by task assignment.

5.4 Are Superiors Promoting Yes-men?

The baseline results in Table 6 (particularly promotion results) might reflect superior's favoritism or preference for yes-man type managers rather than competency-based promotion. In other words, the results might be driven by superiors who give better skill ratings (i.e., higher SLS score) to their favored subordinates and try to promote them further.[16] However, this is unlikely for two reasons. First, among manager skills, *MktAwareness* and *TeamAssessment* may partly reflect a manager's tendency to act as a "yes-man," as they include the habit of reporting to superiors. *TeamAssessment* also

[15] To address all sources of bias including cases (i)-(iii), we also computed various instrumental variable (IV) estimators for equation (1) without manager FE, exploiting exogenous manager changes due to periodic job rotation. However, due to weak instrument problems, the results were not robust.

[16] More broadly, superiors may assign higher skill ratings when they perceive a strong match quality with the manager (Peeters et al. 2020). Because match quality arises from cooperative interactions between managers across hierarchical levels, the empirical tests in this subsection also examine this interpretation.

encompasses whether the employee genuinely accepts suggestions and advice from superiors. However, neither skill is rewarded with performance evaluation or promotion (Table 6). Although the results are not presented, *TeamAssessment* tends to be even negatively associated with performance evaluation.

Second, we run additional regressions controlling for a variable called *Supportive*, which is the superior's overall satisfaction score (on a 5-point scale) for the close support from a manager, collected in the manager skill survey in addition to 40 manager skill items. We believe this score should capture superior favoritism towards a manager or a manager's yes-man nature to some extent. The results in Appendix Table B8 show that the baseline results in Table 6 remain mostly robust even after controlling for *Supportive*. Furthermore, *Supportive* is not rewarded with promotion, although it tends to be rewarded with performance evaluation.

In summary, the analyses in Section 5 suggest that our baseline results for subordinates' performance evaluation—particularly for PMS upward—are robust with respect to both the direction and significance of the coefficients across additional tests. Regarding subordinates' retention, the positive effects of coordination skills are less robust. The results in Sections 5.3-5.4 also confirm the robustness of our baseline results for managers' performance and promotion against alternative interpretations.

6. Theoretical Framework for Interpreting the Results

6.1 Model

Our results are based on one Japanese management consulting firm. To interpret our results in more general settings and derive empirical implications of how changes in the importance of particular skill sets affect optimal promotion and pay schemes, we use the standard multitask model with the linear pay scheme of Baker (2002) combined with the job assignment model of Ekinci et al. (2019) and Owan (2004): We assume that the firm can use both pay for performance and promotions to motivate employee effort, but that wages after promotion are determined by market expectations of the skills possessed.

Assume that the firm employs a manager for two periods. She is first assigned to a first-line managerial position and exerts effort to improve her team's output y_1. The manager makes a binary effort decision $e_1 \in \{0,1\}$ at a cost of c. Namely, the manager chooses to either "shirk" ($e_1 = 0$) or "work" ($e_1 = 1$). y_1 takes the value of either R (success) or 0 (failure). The manager always succeeds in producing R when she has high PMS, denoted by $p = p_H$. When the manager has low PMS, denoted by $p = p_L$, $Prob(y_1 = R) = q_e$, where $1 > q_1 > q_0 > 0$. y_1 is an objective performance measure observable to the firm that cannot directly observe p or e. When promoted to a senior management position, the manager produces value $V(s)$, where s is her skill set required for the higher-level position. We call this the manager's SLS, which is either high ($s = s_H$) or low ($s = s_L$). V is also either $V_H = V(s_H)$ or $V_L = V(s_L)$, where $V_H > q_1 R > q_0 R > V_L$, implying that promoting a manager with low SLS is never efficient. Note that PMS p affects current performance as a first-line manager, and SLS s affects performance as a senior manager. p and s are positively correlated. After the first period, the firm observes the signal $\tilde{s} \in \{s_L, s_H\}$ of s in addition to y_1. We assume that $\tilde{s} = s$ with probability α ($> \frac{1}{2}$) and $\tilde{s} \neq s$ with probability 1-α. p and s are distributed as follows: $g(p_H, s_H) = g_{HH}, g(p_H, s_L) = g_{HL}, g(p_L, s_H) = g_{LH}, g(p_L, s_L) = g_{LL}$, where $g(p, s)$ is the probability that the manager's PMS and SLS are p and s, respectively. $g_{HH} g_{LL} > g_{HL} g_{LH}$. Let $g_p = g_{HH} + g_{HL}$, which is the probability that the manager has high PMS.

We first assume that exerting effort is always efficient even when the manager's skill is unknown. Namely, $E[y_1|e_1 = 1] - E[y_1|e_1 = 0] = (1 - g_p)R(q_1 - q_0) > c$. Therefore, we design an incentive scheme that induces $e = 1$ while achieving efficient job assignment.

Managers are employed for two periods. Long-term contracts are unavailable. At the beginning of the first period, as a first-line manager, neither side has any information about the manager's skill levels p and s. Without such information, the firm offers the incentive scheme $w_1 = \beta y_1$ for periods when manager is employed as a first-line manager. We assume that managers are liquidity constrained and that $w_1 \geq 0$; thus, β represents the bonus for success. The reservation utility u for first-line

managers is also assumed to be low enough such that $E[w_1] > u$. In the second period, a manager may be promoted to a senior managerial position or may be kept as a first-line manager. A manager receives $w_s = \gamma E[V(s)|promoted]$ if promoted and $w_2 = \hat{\beta} y_2$ if not promoted. Job assignments are observable to the market; thus, the wages of senior managers depend on the equilibrium promotion policy adopted by the firm. $\gamma(< 1)$ can be interpreted as the measure of firm specificity of SLS. $\hat{\beta}$ is chosen such that the manager chooses $e_2 = 1$ and $w_2 - c \geq u$. From the manager's viewpoint, $\Delta w = w_s - E[w_2]$ is exogenous.

At the beginning of the first period, the manager chooses the first-period effort level e_1 without knowing her PMS p or SLS s but expecting that her first-period performance will not only affect her pay in that period but may also influence her chance of promotion in the second period. The firm observes y and $\tilde{s}$ after the first period and decides whether or not to promote her. Note that promoting the manager is *ex post* efficient if and only if $V_L + (V_H - V_L)Prob[s = s_H|y_1, \tilde{s}] \geq E[y_2] - c$. However, since the prospect of promotion could encourage managers to work hard in the first period, the optimal promotion policy may not be efficient *ex post*. In other words, firms make a tradeoff between incentivizing managers in the first period and efficiently assigning positions in the second period.

Note that

$$Pr[s = s_H|y_1 = R, \tilde{s} = s_H] = \frac{g_{HH}\alpha + g_{LH}q_1\alpha}{g_{HH}\alpha + g_{LH}q_1\alpha + g_{HL}(1-\alpha) + g_{LL}q_1(1-\alpha)} \quad (7)$$

$$Pr[s = s_H|y_1 = R, \tilde{s} = s_L] = \frac{g_{HH}(1-\alpha) + g_{LH}q_1(1-\alpha)}{g_{HL}\alpha + g_{LL}q_1\alpha + g_{HH}(1-\alpha) + g_{LH}q_1(1-\alpha)} \quad (8)$$

$$Pr[s = s_H|y_1 = 0, \tilde{s} = s_H] = \frac{g_{LH}\alpha}{g_{LH}\alpha + g_{LL}(1-\alpha)} \quad (9)$$

$$Pr[s = s_H|y_1 = 0, \tilde{s} = s_L] = \frac{g_{LH}(1-\alpha)}{g_{LL}\alpha + g_{LH}(1-\alpha)} \quad (10)$$

Based on these expected probabilities of having high SLS and the incentive effect of promoting first-period high performers, the optimal promotion policy is determined. The optimal promotion policy should take one of the following four types:

(1) Star: promoted only when $y_1 = R$ and $\tilde{s} = s_H$

(2) Performance-based: promoted when $y_1 = R$

(3) Competency-based: promoted when $\tilde{s} = s_H$

(4) Egalitarian: promoted when $y_1 = R$ or $\tilde{s} = s_H$.

Regarding the correlation between promotion and skills, policies 2 and 3 produce the most pronounced differences. Specifically, the correlation between promotion and SLS is strongest under the competency-based policy, whereas the correlation between promotion and PMS is strongest under the performance-based policy.

The star policy cannot be optimal when V_L is not sufficiently low, i.e., promoting someone with low SLS is not seriously harmful.[17] Furthermore, the egalitarian policy rarely outperforms both performance-based and competency-based promotion policies. One problem with the egalitarian policy is that it could result in too many managers being promoted while the incentive effect is weaker than the performance-based promotion policy. For these reasons, and to simplify the comparison between the most distinctive policies, we assume that the firm adopts either a performance-based or a competency-based policy.

For each of the two promotion policies, we present the firm's optimization problem. β must be chosen to satisfy the incentive compatibility (IC) constraint. Note that the individual rationality constraint is satisfied by definition and assumption.

Performance-based Promotion Policy

$$\max_{\beta} \Pi_p$$

$$= \{g_{HH} + g_{HL} + (g_{LH} + g_{LL})q_1\}(1-\beta)R$$

$$+(1-\gamma)(g_{HH} + g_{LH}q_1)V_H + (1-\gamma)(g_{HL} + g_{LL}q_1)V_L$$

$$+\{1 - g_{HH} - g_{HL} - (g_{LH} + g_{LL})q_1\}q_1\left(R - \frac{c}{q_1 - q_0}\right)$$

[17] The star policy is never optimal if

$$V_L \geq \frac{1}{1-\gamma}\frac{g_{HH}+g_{HL}+(g_{LH}+g_{LL})q_1}{g_{HL}+g_{LL}q_1}\left(R - \frac{c}{q_1-q_0}\right) - \frac{g_{HH}+g_{LH}q_1}{g_{HL}+g_{LL}q_1}\frac{1-\alpha}{\alpha}V_H$$

$$\text{subject to } (q_1 - q_0)(g_{LH} + g_{LL})\big(\beta R + \Delta u_p\big) \geq c \tag{11}$$

where the first term is the expected profit gained from the first-period manager, the second and third terms indicate the expected profit from the second-period manager who gets promoted, and the last term is the expected profit from the second-period manager who stays in the first-line position. The constraint is the IC constraint, meaning that the expected return to the manager's effort exceeds the cost of effort.

Note that Δu_p is the utility increase associated with promotion under the performance-based policy and $\Delta u_p = \gamma \frac{g_{HH} + g_{LH} q_1}{g_{HH} + g_{HL} + (g_{LH} + g_{LL}) q_1} V_H + \gamma \frac{g_{HL} + g_{LL} q_1}{g_{HH} + g_{HL} + (g_{LH} + g_{LL}) q_1} V_L - \frac{q_0 c}{q_1 - q_0}$

Note that the last term of the profit function, $\left(R - \frac{c}{q_1 - q_0}\right)$, is from the second-period piece rate $\hat{\beta}^* = \frac{c}{(q_1 - q_0)R}$ for those who were not promoted[18]:

Competency-based Promotion Policy

$$\max_{\beta} \Pi_c$$

$$= \{g_{HH} + g_{HL} + (g_{LH} + g_{LL}) q_1\}(1 - \beta) R$$

$$+ (1 - \gamma)(g_{HH} + g_{LH}) \alpha V_H + (1 - \gamma)(g_{HL} + g_{LL})(1 - \alpha) V_L$$

$$+ \{(1 - \alpha)(g_{HH} + g_{LH} q_1) + \alpha(g_{HL} + g_{LL} q_1)\}\left(R - \frac{c}{q_1 - q_0}\right)$$

$$\text{subject to } (q_1 - q_0)(g_{LH} + g_{LL}) \beta R \geq c \tag{12}$$

Note that Δu_c, the utility increase associated with promotion, does not appear in the IC constraint under the competency-based policy because the chance of being promoted $(g_{HH} + g_{LH})\alpha + (g_{HL} + g_{LL})(1 - \alpha)$ does not depend on the manager's first-period effort. In this case, the first and second period piece rates are $\beta^* = \frac{c}{(g_{LH} + g_{LL})(q_1 - q_0)R}$ and $\hat{\beta}^* = \frac{c}{(q_1 - q_0)R}$, respectively.[19]

[18] Note that those who do not get promoted all have low PMS. Therefore, manager's second-period IC constraint is $q_1 \hat{\beta} R - c \geq q_0 \hat{\beta} R$, which can be rearranged to $\hat{\beta} = \frac{c}{(q_1 - q_0)R}$.

[19] Under the competency-based promotion policy, the first-line managers who do not get promoted are a mixture of high PMS and low PMS managers, but unlike in the first period, the managers now know their type. The piece rate can be lower because low PMS managers know that their chance of successful production is lower unless they work hard, while high PMS managers can produce successfully without effort.

Optimal Promotion Policies

To facilitate comparison between the two promotion policies, we make one more assumption. Let $g_{HH} = g_{LL} = \frac{k}{2}$ and $g_{HL} = g_{LH} = \frac{1-k}{2}$, where k is the correlation parameter between p and s, and $\frac{1}{2} < k < 1$. We also make two additional assumptions.

Assumption 1

(1) $(1-\gamma)V_H > \{(k + (1-k)q_1\}\left(R - \frac{c}{q_1 - q_0}\right)$

(2) $(1-\gamma)V_L < \{(1-k+kq_1)\left(R - \frac{c}{q_1 - q_0}\right)$

Assumption 1 simply means that promoting a manager is more profitable if her SLS is known to be high, while doing so is suboptimal if her SLS is known to be low, *i.e.* $(1-\gamma)V_H > Prob(y_1 = R|s = s_H)\left(1-\hat{\beta}\right)R$ and $(1-\gamma)V_L < Prob(y_1 = R|s = s_L)\left(1-\hat{\beta}\right)R$.

Assumption 2 $q_0 < \frac{1-k}{2-k} < 1-k < q_1$

Assumption 2 ensures that the information rent, $\frac{q_0}{q_1 - q_0}c$, paid by the firm to managers who are not promoted is sufficiently low. If this assumption is violated, performance-based promotions may not provide sufficient incentive to managers, because if the cost parameter c is high, managers can earn substantial rents without promotion.

Now, the following proposition can be obtained by comparing the firm's profit under the two promotion policies.

Proposition 1 Suppose Assumptions 1-2 hold. Then, a competency-based promotion policy is more likely to be optimal when k is smaller, α is larger, and c is smaller.

The proof is in Appendix A.

Proposition 1 is quite intuitive. When k is smaller and closer to $\frac{1}{2}$, the manager's PMS and SLS become less correlated, which implies that promoting a high-performer is more likely to lead to inefficient matching, that is, promoting someone with low SLS that is required for senior managers. When α is larger, the signal of SLS becomes more precise, thus promoting based on competency becomes more desirable. When c is smaller, a bonus-based incentive system is more likely to be an

adequate and less costly choice for firms, thus eliminating the need for firms to rely on promotions as additional means of providing incentives.

6.2 Interpreting the Results Using the Model's Predictions

Our firm data have revealed that (1) managers' PMS upward predict their own performance evaluations but not their promotions, and (2) managers with higher SLS tend to be promoted. These findings are consistent with competency-based promotions and differ from the prediction of the Peter Principle or performance-based promotion. Proposition 1 in Section 6.1 indicates that a competency-based promotion policy is more likely to be optimal when (i) the correlation between PMS upward and SLS is low, (ii) the signal for SLS is precise (large α), and (iii) the effort cost c is small. In this subsection, we discuss whether these conditions hold for this company.

Low correlation between PMS upward and SLS: Notably, the observed SLS of managers *before* promotion is a signal for SLS demonstrated *after* a promotion. Thus, we should focus on the correlation between PMS upward *before* the promotion and SLS *after* the promotion of the same manager. Table 8 reports that this correlation is actually low (0.21 between *PMS_Up* and aggregate *SLS*) and statistically insignificant. The correlation between PMS upward (*PMS_Up*) and each skill that constitutes aggregate SLS (*Coordination* and *MktAwarenesst*) is also low and insignificant, although a somewhat weak positive correlation exists between PMS upward and *PerformMgmt*.

Precise signal for SLS: SLS evaluated before promotions to senior managerial positions should be imprecise because first-line managers have limited opportunities to reveal their SLS. Thus, we interpret SLS *before* promotions as a signal for SLS, and SLS *after* promotions as true SLS. Their correlations shown in Table 8 are relatively high (0.54) and statistically significant at the 1% level. The correlation coefficient of each skill that constitutes aggregate SLS between time t before promotion and time (t+1) after promotion is also approximately 0.5. This intertemporal correlation is much stronger than that between PMS upward and the SLS of promoted managers mentioned above.

Small effort cost: Measuring effort costs directly is difficult. However, inducing high team performance is expected to be easier when sales growth rate and profit rate are higher, which captures industry growth or the demand for a firm's services. The average sales growth rate and operating profit margin of the company analyzed in this study are approximately 18% and 6%, respectively, during 2010–2020. These figures are much higher than the average of all industries in Japan (0.0% and 3.6%), non-manufacturing (0.2% and 3.5%), service (-1.2% and 5.4%), and "other scientific research, professional and technical services" industries that include consulting businesses (3.0% and 4.2%).[20]

Our model can also explain why performance-based promotion or Peter Principe phenomenon is observed in firm studies such as Benson et al. (2019) and several cases in the sports or university contexts (Schleu and Hüffmeier 2021). While it is hard to argue that skills required for salespersons or athletes are similar to those needed for sales managers or coaches, it is highly likely that comprehensive skill surveys are absent and signals of skill requirements in higher-level positions are imprecise. Moreover, effort costs may be large for salespersons and athletes, necessitating promotion opportunities to provide additional incentives. The last two conditions supporting performance-based promotion may outweigh the first condition favoring competency-based promotion according to our model. Hoffman and Tadelis (2021) may also appear to be an example of performance-based promotion. However, their data lacks information on skills required for higher-level positions, such as our SLS. If PMS and SLS are correlated and SLS are omitted from the analysis, PMS and promotion may correlate due to omitted variable bias, even if the firm makes promotion decisions based on SLS.

7. Conclusions

Using comprehensive manager skill survey data from a Japanese management consulting company, we identify two types of manager skills: people management skills (PMS), and senior leadership skills (SLS), the latter of which are required more for higher-level managers. We find that

[20] The figures for Japan are based on the "Financial Statements Statistics of Corporations by Industry" released by the Ministry of Finance, Japan. "All industries" exclude finance and insurance industries.

only managers' PMS upward, which is observed by their subordinates (and not the PMS downward observed by managers' superiors), positively predicts the subordinates' performance of the current team. Managers' PMS upward also positively predicts their own performance evaluation that is liked to performance-based pay; however, it is not correlated with their promotion. By contrast, managers' SLS, such as performance management and coordination skills, are rewarded with promotion and those with high SLS tend to perform better after promotion. The results are consistent with the view that competency-based promotion, rather than performance-based promotion, is adopted in this company. Performance evaluations (and the associated compensation system) provide appropriate incentives for managers to improve current team performance, while promotions serve as a device for efficient human resource allocation. In other words, the compensation and promotion systems are likely to function in a complementary manner in this company rather than as substitutes as depicted in Ekinci et al. (2019).

The findings imply two insights. First, the skills required by first-line and senior managers are very different. For first-line managers, PMS is a primary requirement, whereas SLS is much more important for senior managers. The literature on managerial talent development seems to support this view (Lord and Hall 2005, Charan et al. 2011, Kaiser et al. 2011, Matsuo 2019). Since interpersonal skills are included in both PMS and SLS, the study also suggests that there may be multiple mechanisms in which interpersonal skills improve employee earnings. Second, the Peter Principle is not an inevitable consequence if the conditions including the reliable skill evaluation technology allow the firm to use competency-based promotion. Our model predicts that competency-based promotion is optimal when valuable skills before and after a promotion are not sufficiently correlated; when the skills required after a promotion can be evaluated relatively precisely before a promotion; and/or when the manager's effort cost is low. Note that recent technological developments, such as the spread of talent management systems and standardized skill taxonomy, as well as improvements in firms' efforts to measure skills, will all contribute to the increasing likelihood that competency-based promotion will be adopted by

more firms.[21]

As this study is based on personnel records from a single company, it is important to consider potential limitations related to external validity. While traditional Japanese firms often follow seniority-based promotion policies, this pattern does not hold for newly emerging companies or within the management consulting industry. The focal company operates in a competitive, lightly regulated environment and has developed its business and human resource policies from the ground up over the past few decades amid rapid growth. Given these characteristics, its promotion practices are likely to be economically rational and amenable to interpretation through general theoretical frameworks. Accordingly, we present our findings as a case study that aligns with universal theory, mitigating concerns about external validity (List 2020). However, a key limitation is the absence of a counterfactual scenario in which performance-based promotion policies are adopted under alternative parameter values within comparable economic conditions. While additional case studies would be valuable for further validating the theory, such an extension lies beyond the scope of this paper and is left for future research.

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[21] For example, see the effort made by World Economic Forum in standardizing skill taxonomy below (accessed March 9, 2025): https://www.weforum.org/publications/global-skills-taxonomy-adoption-toolkit-defining-a-common-skills-language-for-a-future-ready-workforce/

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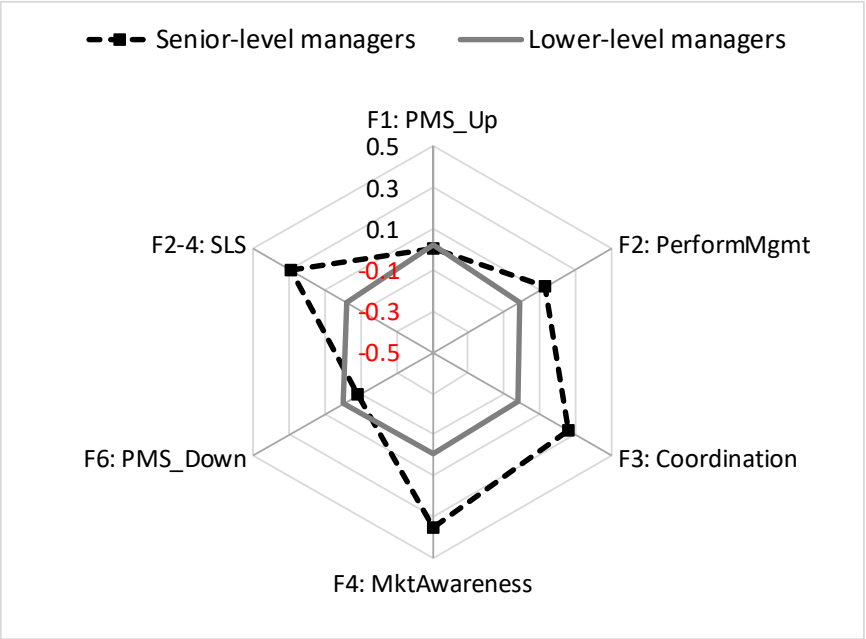
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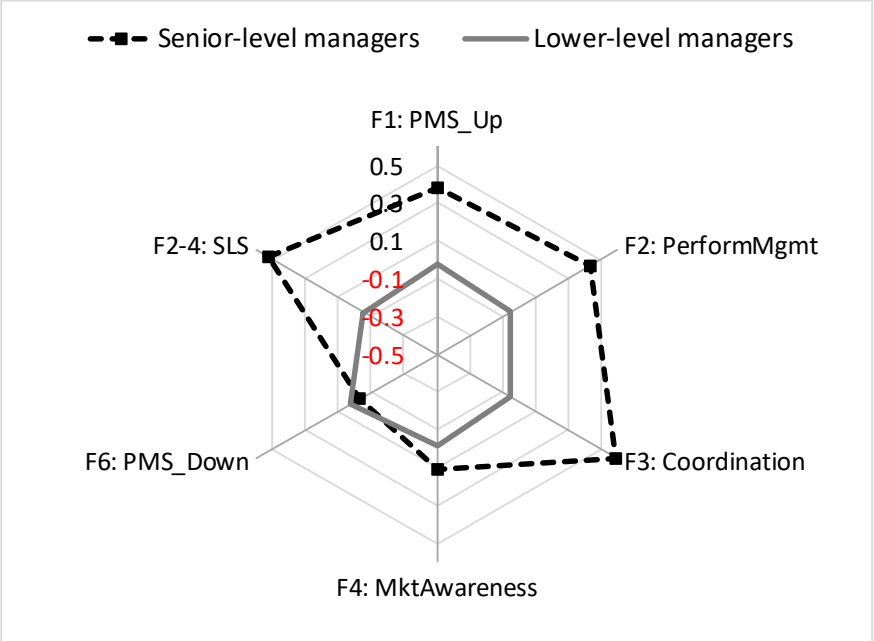
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Figure 1. Skills by Senior- and Lower-level Managers

(a) Average of Standardized Expectation Score



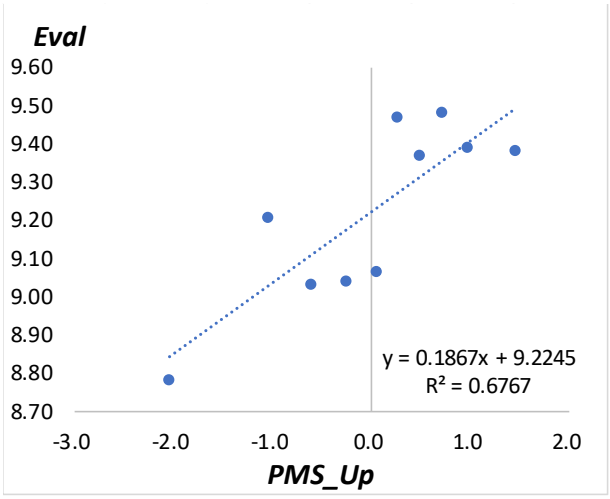
(b) Average of Standardized Satisfaction Score



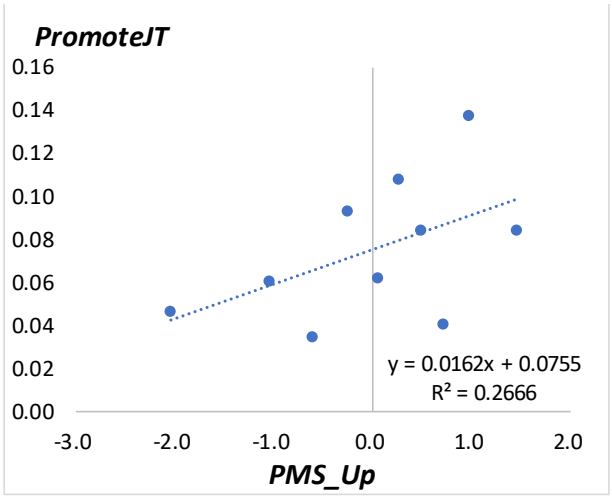
Notes: Senior-level managers (50 observations) are those with the second-highest job level, which mostly include department heads. Lower-level managers (871 and 866 observations for (a) and (b), respectively) are those with the third- and fourth-highest job levels, including unit mangers, area or branch managers, group managers, and managers. For the construction of satisfaction scores, see Section 2.2. The 5-point scale for the degree of expectation is asked for the same 80 items on manager skills as satisfaction questions. Then, expectation scores for six factors are computed as follows. First, we assume that each of the 80 questions is classified into the factor group with the highest factor loadings in Table B1. The average of the standardized expectation scores across all questions within the same factor group is regarded as the expectation score for the corresponding group. The expectation score for *SLS* is computed similarly as satisfaction scores.

Figure 2. Manager Skills and Mangers' Own Performance

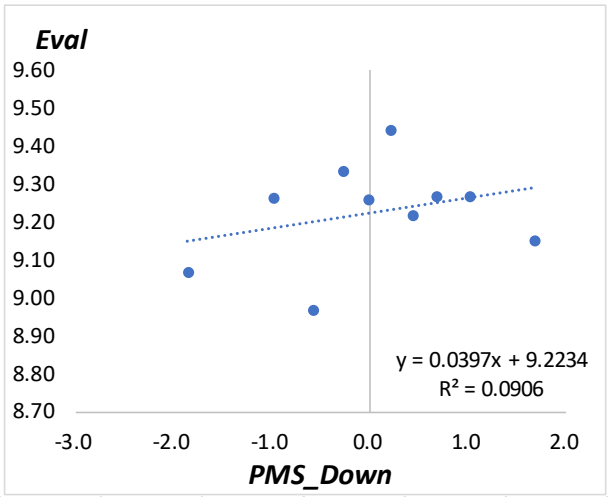
(a) PMS Upward and Performance Evaluation



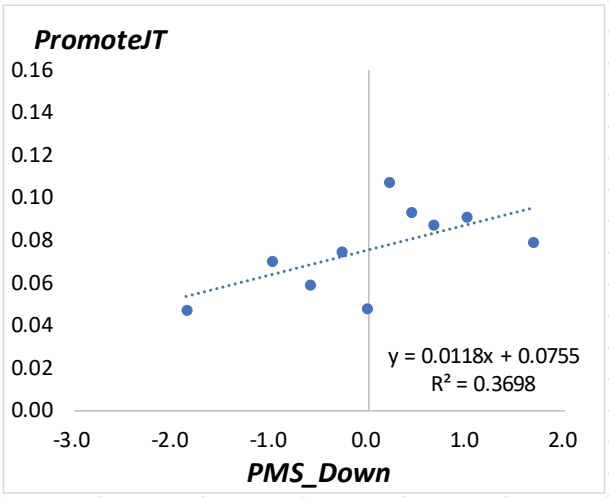
(b) PMS Upward and Promotion Rate



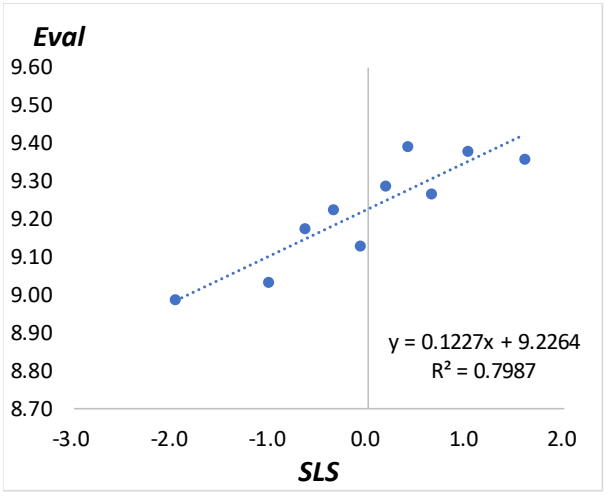
(c) PMS Downward and Performance Evaluation



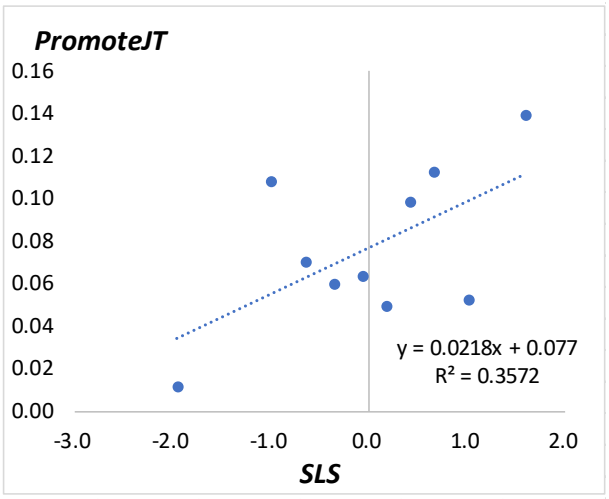
(d) PMS Downward and Promotion Rate



(e) SLS and Performance Evaluation



(f) SLS and Promotion Rate



Notes: Each data point represents the averages of *y*-axis and *x*-axis variables for each decile group of managers, which is created based on the *x*-axis manager skill.

Table 1. Contemporaneous Correlations among Manager Skills

	F1	*F2*	*F3*	*F4*	*F5*	*F6*	*SLS*
F1: PMS_Up	1.000						
F2: PerformMgmt	0.258	1.000					
F3: Coordination	0.179	0.314	1.000				
F4: MktAwareness	0.145	0.202	0.314	1.000			
F5: TeamAssessment	0.175	0.239	0.300	0.170	1.000		
F6: PMS_Down	0.236	0.022	0.150	-0.095	0.226	1.000	
F2-4: SLS	0.270	0.700	0.753	0.707	0.328	0.034	1.000

Notes: All correlations (except for highlighted gray cells) are statistically significant at the 1% level. Based on 954 (191 manager × 11 periods) observations. F5: *TeamAssessment*, which is not classified as PMS nor SLS, is used as a control variable in the main analysis.

Table 2. Description of Manager Skills and Representative Survey Items

Manager skills	Skill description and representative survey items
PMS (people management skills)	
F1: PMS upward	People management skills (PMS) mainly observed by subordinates. It represents subordinates' evaluation of overall manager skills that cover communicating market situations or firm/team visions and goals; understanding and assessing the situations and challenges of team/subordinates; coaching, guiding, supporting, and delegating work to subordinates to enhance their motivation and growth; and making appropriate judgements. (Representative survey items) • Communicate to subordinates the background, purpose, and significance of team goals • Teach work tips and know-how to subordinates
F6: PMS downward	PMS mainly observed by superiors. It represents superiors' evaluation of managers' subordinate management skills including understanding, supporting, coaching, and delegating work to subordinates (Representative survey items) • Support subordinates when they face work-related problems • Create an atmosphere where team members can help each other
SLS (senior leadership skills)	
F2: Performance management	Skills for managing workflow, progress, quality, and pursuing short-term results (Representative survey items) • Responsibly manage work progress • Make every effort to achieve immediate goals
F3: Coordination	Skills for coordinating and cooperating with other work units/stakeholders and thinking/acting from a company-wide perspective (Representative survey items) • Take on new roles proactively from a company-wide perspective • Proactively build cooperative relationships with other work units/departments
F4: Market awareness	Skills for recognizing, assessing, and reporting the situations of external environment such as customers, competitors, the market, and the industry (Representative survey items) • Communicate market changes and trends • Communicate industry trends and their impact on the company
Other skills (used as a control variable in the main analysis)	
F5: Team assessment and reporting	Skills for assessing and reporting the workplace situations and challenges, which can be interpreted as basic team skills required for most white-collar workers

Notes: Skill descriptions are based on the contents of the manager skill survey items with the high-factor loadings in Table B1. At the company's request, we cannot disclose the detailed contents of all survey items. We list up ten representative survey items for PMS and SLS, which are generally the top two items with the highest factor loadings for each factor, but have different meanings.

Table 3. Summary Statistics

	Subordinate sample		Manager sample	
	Mean	Std. Dev.	Mean	Std. Dev.
Outcomes:				
Eval: Overall performance evaluation score after two months (= ***EvalA*** + ***EvalSG***, range: 2-18)	9.575	0.896	9.224	1.077
EvalA: Achievement evaluation score after two months	4.673	0.704	4.459	0.811
EvalSG: Stretch goal evaluation score after two months	4.902	0.564	4.768	0.640
Retention: Continue working after six months (0/1)	0.939	0.240	0.977	0.150
PromoteJT: Promoted in terms of job levels within six months (0/1)	0.032	0.177	0.075	0.264
Manager skills:				
F1: PMS_Up: People management skills mainly reported by subordinates	-0.004	0.932	-0.003	0.995
F2: PerformMgmt: Performance management skills	0.103	0.934	-0.014	0.984
F3: Coordination: Coordination skills	-0.079	1.009	-0.011	0.997
F4: MktAwareness: Market awareness skills	-0.067	0.924	-0.010	1.005
F5: TeamAssessment: Team assessment and reporting skills (used as a control variable)	-0.032	0.981	0.036	0.981
F6: PMS_Down: People management skills mainly reported by superiors	0.015	0.896	0.029	0.988
SLS: Senior leadership skills (standardized average of F2-F4)	-0.020	0.943	-0.016	0.995
Other characteristics:				
Female (0/1)	0.467	0.499	0.252	0.434
Hired mid-career (0/1)	0.470	0.499	0.516	0.500
Age	35.023	9.446	40.286	6.843
Tenure	4.408	2.826	7.068	3.532
Work unit size (number of employees)	6.161	4.733	4.328	3.562
Manager: female (0/1)	0.295	0.456	-	-
Manager: age	40.793	6.572	-	-
Manager: tenure	6.899	3.060	-	-
Manager: non-general career-track type (0/1)	0.016	0.125	-	-
Manager: concurrent post (0/1)	0.208	0.406	-	-

Notes: Subordinate sample = *Eval* regression sample in Table 4. Manager sample = *Eval* regression sample in Table 6. Manager skill variables are standardized (mean=0, SD=1) based on all available manager × time observations. For variable descriptions, see Section 2.

Table 4 Manager Skills and Subordinate Performance: Overall Performance Evaluation and Retention

Dependent var.	*Eval* (overall performance evaluation)				*Retention*			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Specification 1								
PMS_Up	**0.063*** **	**0.080*** **	**0.070** **	**0.057***	0.010	**0.016***	0.014	**0.015***
	(0.025)	(0.029)	(0.033)	(0.034)	(0.007)	(0.008)	(0.009)	(0.009)
PerformMgmt	0.015	-0.018	0.036	-0.019	-0.001	**-0.008***	-0.005	-0.006
	(0.021)	(0.023)	(0.029)	(0.027)	(0.004)	(0.005)	(0.006)	(0.006)
Coordination	**-0.046** **	-0.037	-0.039	-0.037	**0.012*** **	**0.015*** **	**0.014*** **	**0.011** **
	(0.021)	(0.022)	(0.025)	(0.023)	(0.004)	(0.005)	(0.005)	(0.006)
MktAwareness	-0.023	**-0.043** **	**-0.060** **	**-0.049***	**-0.012** **	-0.009	**-0.015** **	**-0.014***
	(0.019)	(0.021)	(0.025)	(0.029)	(0.005)	(0.007)	(0.006)	(0.007)
PMS_Down	-0.027	-0.001	-0.034	-0.027	-0.004	-0.002	-0.003	-0.003
	(0.019)	(0.024)	(0.024)	(0.027)	(0.004)	(0.004)	(0.005)	(0.005)
Specification 2								
PMS_Up	**0.068*** **	**0.081*** **	**0.071** **	**0.057***	0.010	**0.014***	0.013	0.014
	(0.025)	(0.029)	(0.033)	(0.034)	(0.007)	(0.008)	(0.009)	(0.009)
SLS	**-0.043** **	**-0.070*** **	**-0.049***	**-0.076*** **	0.002	0.002	-0.002	-0.003
	(0.017)	(0.019)	(0.027)	(0.026)	(0.005)	(0.005)	(0.006)	(0.007)
PMS_Down	-0.028	0.001	-0.027	-0.024	-0.002	-0.001	-0.002	-0.001
	(0.019)	(0.023)	(0.024)	(0.027)	(0.004)	(0.004)	(0.005)	(0.005)
Subordinate FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Manager FE			Yes	Yes			Yes	Yes
Work unit FE		Yes		Yes		Yes		Yes
Observations	7,320	7,320	7,320	7,320	6,705	6,705	6,705	6,705
Subordinates	1,390	1,390	1,390	1,390	1,349	1,349	1,349	1,349
Managers	187	187	187	187	175	175	175	175

Notes: In all specifications, subordinate's age (quadratic), tenure (quadratic), employment types (6 categories), job grades (10), job levels (4), number of employees affiliated with the subordinate's work unit, and period are controlled for. Manager characteristics such as team assessment and reporting skills, gender, age, tenure, employment types (2 categories), job grades, job levels, and concurrent post dummy are also controlled for. In addition, group firm affiliation dummies (15 categories) are controlled for in columns (1) and (3), whereas more detailed work unit affiliation dummies are controlled for in columns (2) and (4). Robust standard errors clustered by subordinate and manager are in parentheses. ***p < 0.01, **p < 0.05, *p < 0.1.

Table 5. Manager Skills and Subordinate Performance: Whether or Not Under the Same Manager for at Least Two Periods

	***Eval* (overall performance evaluation)**				***Retention***			
	Same M sample		**Different M sample**		**Same M sample**		**Different M sample**	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Specification 1								
PMS_Up	**0.122*** **	**0.144*** **	0.063	-0.022	**0.028*** **	**0.036*** **	0.004	0.010
	(0.038)	(0.043)	(0.041)	(0.058)	(0.009)	(0.013)	(0.008)	(0.014)
PerformMgmt	-0.023	-0.028	-0.006	-0.009	-0.009	-0.009	**-0.016** **	**-0.020***
	(0.036)	(0.045)	(0.033)	(0.048)	(0.007)	(0.008)	(0.008)	(0.012)
Coordination	-0.048	-0.015	0.012	0.024	0.010	0.010	**0.018***	**0.021***
	(0.032)	(0.036)	(0.038)	(0.042)	(0.008)	(0.009)	(0.010)	(0.012)
MktAwareness	-0.050	-0.048	-0.018	0.007	-0.012	**-0.019***	-0.001	**-0.027** **
	(0.033)	(0.038)	(0.036)	(0.048)	(0.008)	(0.010)	(0.010)	(0.013)
PMS_Down	-0.010	-0.040	0.014	0.063	0.003	-0.001	0.000	0.015
	(0.037)	(0.041)	(0.032)	(0.039)	(0.005)	(0.007)	(0.008)	(0.012)
Specification 2								
PMS_Up	**0.123*** **	**0.141*** **	0.062	-0.025	**0.027*** **	**0.034*** **	-0.001	0.008
	(0.038)	(0.042)	(0.041)	(0.056)	(0.009)	(0.013)	(0.009)	(0.014)
SLS	**-0.086** **	-0.062	-0.007	0.019	-0.006	-0.010	0.004	-0.010
	(0.035)	(0.044)	(0.022)	(0.045)	(0.007)	(0.008)	(0.008)	(0.012)
PMS_Down	-0.008	-0.036	0.014	0.059	0.004	0.002	-0.001	0.012
	(0.037)	(0.040)	(0.031)	(0.040)	(0.005)	(0.006)	(0.007)	(0.012)
Subordinate FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Manager FE		Yes		Yes		Yes		Yes
Work unit FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	3,470	3,470	2,743	2,743	3,191	3,191	2,313	2,313
Subordinates	922	922	874	874	898	898	784	784
Managers	157	157	166	166	149	149	155	155

Notes: The "Same M sample" results are based on subordinates under the same manager for at least two periods (12 months), whereas the "Different M sample" results are based on the remaining subordinates. Other control variables are the same as those in columns (2) or (4) in Table 4. Robust standard errors clustered by subordinate and manager are in parentheses. ***p < 0.01, **p < 0.05, *p < 0.1.

Table 6. Manager Skills and Manager's Own Performance: Performance Evaluation and Promotion

Dep. Var.	***Eval*** (overall performance evaluation)				***PromoteJT*** (promotion)			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Specification 1								
PMS_Up	**0.213*** **	**0.228*** **	**0.234*** **	**0.237*** **	0.008	0.004	-0.015	-0.019
	(0.041)	(0.046)	(0.053)	(0.061)	(0.010)	(0.012)	(0.015)	(0.017)
PerformMgmt	**0.258*** **	**0.308*** **	**0.234*** **	**0.220*** **	**0.018***	0.020	0.016	**0.031***
	(0.052)	(0.055)	(0.069)	(0.082)	(0.010)	(0.012)	(0.015)	(0.018)
Coordination	-0.006	-0.025	-0.088	-0.113	**0.024** **	**0.027** **	0.010	0.015
	(0.048)	(0.051)	(0.062)	(0.074)	(0.011)	(0.012)	(0.016)	(0.018)
MktAwareness	-0.035	0.040	-0.063	-0.014	-0.009	0.001	-0.018	-0.002
	(0.042)	(0.044)	(0.047)	(0.060)	(0.012)	(0.015)	(0.018)	(0.024)
PMS_Down	0.001	0.003	-0.042	-0.008	-0.002	-0.007	0.006	0.013
	(0.044)	(0.040)	(0.054)	(0.056)	(0.010)	(0.012)	(0.016)	(0.018)
Specification 2								
PMS_Up	**0.223*** **	**0.252*** **	**0.234*** **	**0.238*** **	0.007	0.003	-0.017	-0.020
	(0.042)	(0.048)	(0.055)	(0.063)	(0.010)	(0.012)	(0.016)	(0.018)
SLS	**0.139*** **	**0.227*** **	0.034	0.055	**0.024** **	**0.036*** **	0.005	**0.033***
	(0.039)	(0.048)	(0.057)	(0.073)	(0.010)	(0.013)	(0.014)	(0.018)
PMS_Down	-0.004	-0.022	-0.042	-0.020	0.002	-0.004	0.008	0.015
	(0.045)	(0.042)	(0.055)	(0.057)	(0.010)	(0.012)	(0.016)	(0.017)
Manager FE			Yes	Yes			Yes	Yes
Superior dummies		Yes		Yes		Yes		Yes
Observations	905	895	905	895	809	799	809	799
Managers	182	180	182	180	170	169	170	169

Notes: In all specifications, manager's team assessment and reporting skills, gender, age (quadratic), tenure (quadratic), employment types (3 categories), job grades (8), job levels (4), number of employees affiliated with his or her work unit, group firm affiliation dummies (15), and period are controlled for. Robust standard errors clustered by manager are in parentheses. ***p < 0.01, **p < 0.05, *p < 0.1.

Table 7. Managers' Pre-Promotion Skills and Post-Promotion Performance Evaluation (*Eval*)

Control vars.	None				Age and Y2018-20 dummy			
Eval's timing	8-13 months after promotion		14-19 months after promotion		8-13 months after promotion		14-19 months after promotion	
Model	OLS	Heckman	OLS	Heckman	OLS	Heckman	OLS	Heckman
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Specification 1								
PMS_Up	0.077	-0.044	0.072	0.052	0.083	-0.053	0.007	-0.014
	(0.196)	(0.292)	(0.215)	(0.336)	(0.265)	(0.344)	(0.210)	(0.417)
PerformMgmt	**0.520****	0.455	0.368	0.354	**0.509****	0.401	0.319	0.284
	(0.233)	(0.319)	(0.247)	(0.357)	(0.237)	(0.344)	(0.264)	(0.429)
Coordination	0.126	-0.083	0.089	0.062	0.154	-0.025	-0.013	-0.045
	(0.301)	(0.342)	(0.217)	(0.365)	(0.419)	(0.431)	(0.205)	(0.365)
MktAwareness	0.092	0.184	**0.356***	0.372	0.089	0.141	0.381	0.389
	(0.216)	(0.294)	(0.205)	(0.266)	(0.290)	(0.346)	(0.227)	(0.325)
PMS_Down	0.329	0.154	0.275	0.253	0.380	0.143	0.379	0.327
	(0.220)	(0.296)	(0.249)	(0.347)	(0.272)	(0.363)	(0.280)	(0.431)
IMR		**-1.432***		-0.194		-1.394		-0.311
		(0.832)		(1.203)		(0.868)		(2.331)
First-stage Z		**0.029*****		**0.027*****		**0.033*****		**0.024****
		(0.007)		(0.009)		(0.008)		(0.009)
Specification 2								
PMS_Up	0.155	0.057	0.107	0.095	0.142	0.027	0.054	0.041
	(0.184)	(0.260)	(0.197)	(0.283)	(0.206)	(0.284)	(0.195)	(0.359)
SLS	**0.383****	0.278	**0.562*****	**0.553****	**0.400****	0.255	**0.484****	0.459
	(0.174)	(0.259)	(0.184)	(0.257)	(0.184)	(0.298)	(0.192)	(0.385)
PMS_Down	0.307	0.125	0.259	0.245	0.384	0.136	0.342	0.304
	(0.210)	(0.273)	(0.251)	(0.330)	(0.253)	(0.345)	(0.275)	(0.432)
IMR		**-1.337***		-0.127		-1.383		-0.217
		(0.800)		(1.024)		(0.851)		(2.166)
First-stage Z		**0.029*****		**0.026*****		**0.032*****		**0.023*****
		(0.007)		(0.008)		(0.008)		(0.009)
Observations	45	486	36	343	45	486	36	343
Obs. Selected		45		36		45		36
Managers	41	41	33	33	41	41	33	33

Notes: The table reports estimation results of regressing managers' overall performance evaluation score (*Eval*) after promotion (either 8-13 or 14-19 months after promotion) on their skills just before promotion. "Y2018-20 dummy" is a binary variable indicating the 2018-2020 period, during which senior managers tend to receive lower *Eval* than in the previous period. Regarding the Heckman two-step selection model, which is estimated to account for selection into promotion, the number of managers in the next higher position at the same time (excluding those who were just promoted) is used as an exclusion restriction and included as a regressor in the first-stage selection equation for promotion (first-stage Z variable in the above table). IMR indicates the inverse Mill's ratio. Managers who have been promoted again before the performance evaluation was conducted are excluded from the estimation sample. Robust standard errors adjusted for small sample size for OLS, and bootstrap standard errors (with 1000 replications) for the Heckman selection model are in parentheses. ***p < 0.01, **p < 0.05, *p < 0.1.

Table 8. Intertemporal Correlation between Manager Skills Before and After Promotion

		PMS_Up **before promotion**	***SLS*** **before promotion**			
		PMS_Up	***SLS***	***F2***	***F3***	***F4***
SLS after pro-*motion*	***F2-4: SLS***	0.2141	0.5407***	0.4069***	0.4425***	0.3353**
	F2: PerformMgmt	0.3553**	0.1840	0.5313***	-0.0117	-0.0426
	F3: Coordination	0.1368	0.4565***	0.1489	0.5747***	0.2743*
	F4: MktAwareness	-0.0065	0.5168***	0.2085	0.395***	0.4657***

Notes: Based on 47 observations. ***p < 0.01, **p < 0.05, *p < 0.1.

Appendix A

Proof of Proposition 1

By substituting $g_{HH} = g_{LL} = \frac{k}{2}$ and $g_{HL} = g_{LH} = \frac{1-k}{2}$ into equations (11) and (12),

$$\Pi_p = \frac{1+q_1}{2}(1-\beta_p)R + (1-\gamma)\frac{k+q_1-kq_1}{2}V_H + (1-\gamma)\frac{1-k+kq_1}{2}V_L + \frac{(1-q_1)q_1}{2}\left(R - \frac{c}{q_1-q_0}\right)$$

$$\Pi_c = \frac{1+q_1}{2}(1-\beta_c)R + (1-\gamma)\frac{\alpha}{2}V_H + (1-\gamma)\frac{1-\alpha}{2}V_L + \frac{(1-\alpha)(k+q_1-kq_1)+\alpha(1-k+kq_1)}{2}\left(R - \frac{c}{q_1-q_0}\right)$$

where β_p and β_c are the optimal piece rates for the performance- and competency-based promotion policies, respectively.

Then,

$$\Pi_p - \Pi_c = \frac{1+q_1}{2}(\beta_c-\beta_p)R + (1-\gamma)\frac{k+q_1-kq_1-\alpha}{2}V_H + (1-\gamma)\frac{\alpha-k+kq_1}{2}V_L + \frac{(1-q_1)q_1-(1-2\alpha)k(1-q_1)-\alpha(1-q_1)-q_1}{2}\left(R - \frac{c}{q_1-q_0}\right)$$

We conduct comparative static analysis with respect to k, α and c.

$$\frac{\partial}{\partial k}(\Pi_p - \Pi_c) = \frac{1+q_1}{2}\left(\frac{\partial}{\partial k}\beta_c - \frac{\partial}{\partial k}\beta_p\right)R + (1-\gamma)\frac{1-q_1}{2}(V_H - V_L) + \frac{(2\alpha-1)(1-q_1)}{2}\left(R - \frac{c}{q_1-q_0}\right) \quad (A1)$$

Note that the IC constraint for optimization under the competency-based promotion policy $(q_1-q_0)\frac{1}{2}\beta_c R = c$ is always binding; thus, $\beta_c = \frac{2c}{q_1-q_0}\frac{1}{R}$. Therefore, $\frac{\partial}{\partial k}\beta_c = 0$. The IC constraint for the optimization under the performance-based promotion policy $(q_1-q_0)\frac{1}{2}(\beta_p R + \Delta u_p) \geq c$ may or may not be binding. When it is not binding, $\beta_p = 0$ and $\frac{\partial}{\partial k}\beta_p = 0$. When it is binding, $\beta_p = (\frac{2c}{q_1-q_0} - \Delta u_p)\frac{1}{R}$. Thus, $\frac{\partial}{\partial k}\beta_p = -\frac{1}{R}\frac{\partial}{\partial k}\Delta u_p$, where $\Delta u_p = \gamma\frac{k+(1-k)q_1}{1+q_1}V_H + \gamma\frac{1-k+kq_1}{1+q_1}V_L - \frac{q_0 c}{q_1-q_0}$. Then, $\frac{\partial}{\partial k}\Delta u_p = \gamma\frac{1-q_1}{1+q_1}(V_H - V_L) > 0$, which leads to $\frac{\partial}{\partial k}\beta_p < 0$. Therefore, $\frac{\partial}{\partial k}\beta_p \leq 0$ regardless of whether

it is binding or not. With all the results substituted into equation (A1), we obtain $\frac{\partial}{\partial k}(\Pi_p - \Pi_c) > 0$, which means that the competency-based promotion policy is more likely when k is smaller.

Next,

$$\frac{\partial}{\partial \alpha}(\Pi_p - \Pi_c) = \frac{1+q_1}{2}\left(\frac{\partial}{\partial \alpha}\beta_c - \frac{\partial}{\partial \alpha}\beta_p\right)R - \frac{1-\gamma}{2}(V_H - V_L) + \frac{(2k-1)(1-q_1)}{2}\left(R - \frac{c}{q_1 - q_0}\right) \quad (A2)$$

As before, $\frac{\partial}{\partial \alpha}\beta_c = 0$. When the IC constraint for the optimization under performance-based pay is not binding, $\frac{\partial}{\partial \alpha}\beta_p = 0$. When it is binding, $\frac{\partial}{\partial \alpha}\beta_p = -\frac{1}{R}\frac{\partial}{\partial \alpha}\Delta u_p = 0$. Therefore, $\frac{\partial}{\partial \alpha}(\Pi_p - \Pi_c) = -\frac{1-\gamma}{2}(V_H - V_L) + \frac{(2k-1)(1-q_1)}{2}\left(R - \frac{c}{q_1 - q_0}\right)$. By combining the two inequalities in Assumption 1, $(1-\gamma)(V_H - V_L) > (2k-1)(1-q_1)\left(R - \frac{c}{q_1 - q_0}\right)$. Therefore, $\frac{\partial}{\partial \alpha}(\Pi_p - \Pi_c) < 0$ regardless of whether the IC constraint is binding or not, which implies that a competency-based promotion policy is more likely to be optimal when α is larger.

Finally,

$$\frac{\partial}{\partial c}(\Pi_p - \Pi_c) = \frac{1+q_1}{2}\left(\frac{\partial}{\partial c}\beta_c - \frac{\partial}{\partial c}\beta_p\right)R + \frac{\{\alpha - (2\alpha - 1)k\}(1-q_1) + q_1^2}{2(q_1 - q_0)} \quad (A3)$$

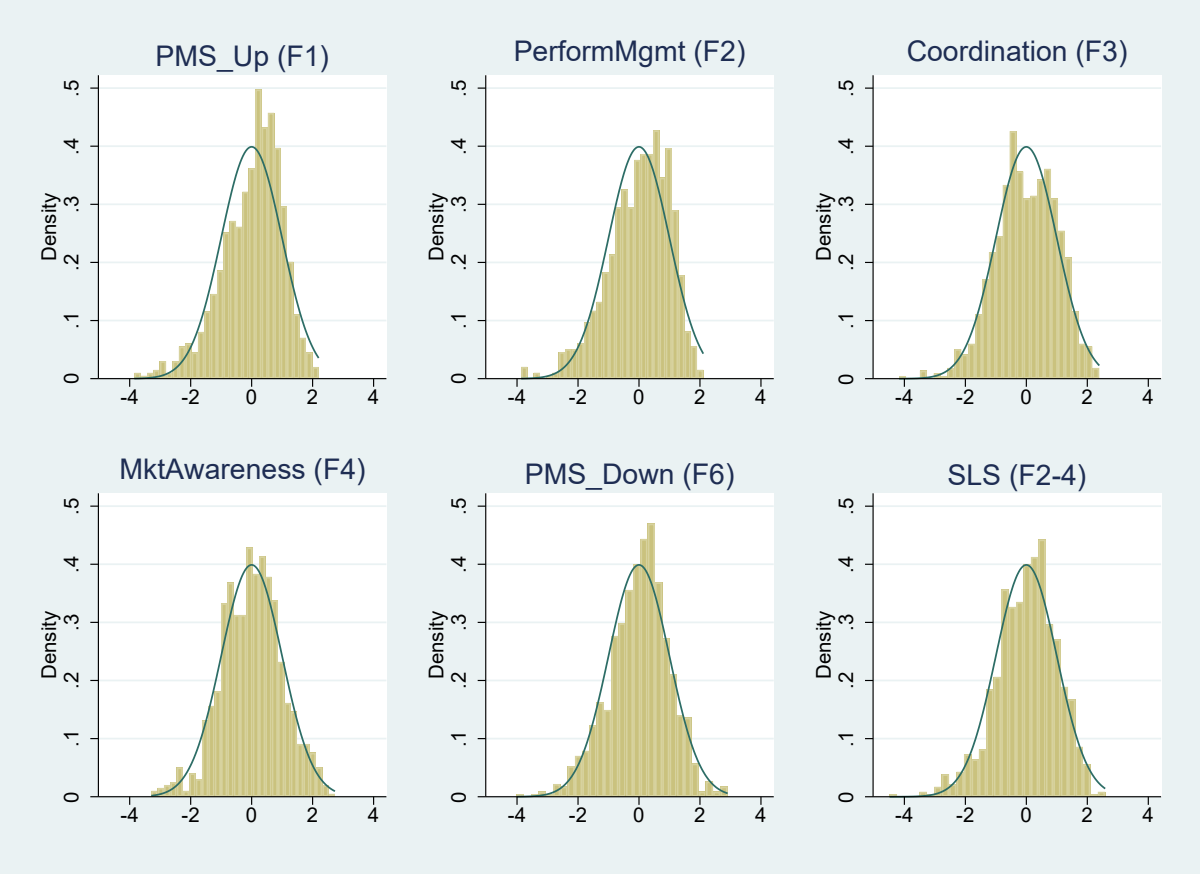
Furthermore, from $\beta_c = \frac{2c}{q_1 - q_0}\frac{1}{R}$, $\frac{\partial}{\partial c}\beta_c = \frac{2}{q_1 - q_0}\frac{1}{R}$. When the IC is not binding for the performance-based promotion policy, $\beta_p = 0$ and $\frac{\partial}{\partial c}\beta_p = 0$. Then, $\frac{\partial}{\partial c}(\Pi_p - \Pi_c) = \frac{2(1+q_1) + \{\alpha - (2\alpha-1)k\}(1-q_1) + q_1^2}{2(q_1 - q_0)} \geq \frac{2(1+q_1) + (1-k)(1-q_1) + q_1^2}{2(q_1 - q_0)} > 0$. When it is binding, $\beta_p = (\frac{2c}{q_1 - q_0} - \Delta u_p)\frac{1}{R}$, $\frac{\partial}{\partial c}\beta_p = (\frac{2}{q_1 - q_0} - \frac{\partial}{\partial c}\Delta u_p)\frac{1}{R}$, where $\Delta u_p = \gamma\frac{k + (1-k)q_1}{1+q_1}V_H + \gamma\frac{1-k+kq_1}{1+q_1}V_L - \frac{q_0 c}{q_1 - q_0}$. Hence, $\frac{\partial}{\partial c}\beta_p = \frac{2+q_0}{q_1 - q_0}\frac{1}{R}$. Therefore, $\frac{\partial}{\partial c}(\Pi_p - \Pi_c) = \frac{1+q_1}{2}\left(\frac{2}{q_1 - q_0}\frac{1}{R} - \frac{2+q_0}{q_1 - q_0}\frac{1}{R}\right)R + \frac{\{\alpha - (2\alpha-1)k\}(1-q_1) + q_1^2}{2(q_1 - q_0)} = \frac{\{\alpha - (2\alpha-1)k\}(1-q_1) + q_1^2 - q_0(1+q_1)}{2(q_1 - q_0)} \geq \frac{(1-k)(1-q_1) + q_1^2 - q_0(1+q_1)}{2(q_1 - q_0)} \geq 0$. The last inequality can be easily shown by Assumption 2. This implies that a competency-based promotion policy is more likely to be optimal when c is lower. This concludes the proof.

Online Appendix

(Appendix B)

People Management Skills, Senior Leadership Skills and the Peter Principle

Figure B1. Distribution of Manager Skills



Notes: The unit of observation is 191 managers × 11 periods (954 observations). All skills scores are standardized (mean = 0, SD = 1). Normal density is added to all graphs. For variable descriptions, see Section 2.2.

Table B1. Factor Loadings of 80 Survey Questions on Manager Skills on the Extracted Factors

Survey respondents	Manager skill (question number)	**F1: PMS _Up**	**F2: Perfo-rmMg-mt**	**F3: Coordi-nation**	**F4: Mkt-Aware-ness**	**F5: Team-Assess-ment**	**F6: PMS _Down**
Subordinates	Q8	**0.863**	-0.007	0.126	-0.033	-0.052	-0.086
Subordinates	Q36	**0.849**	-0.008	0.117	0.019	-0.068	-0.076
Subordinates	Q6	**0.846**	0.003	0.075	-0.025	-0.020	-0.074
Subordinates	Q11	**0.838**	-0.005	-0.038	-0.037	0.046	-0.001
Subordinates	Q23	**0.836**	0.060	-0.072	0.013	0.068	-0.023
Subordinates	Q4	**0.830**	0.016	0.168	-0.050	0.012	-0.157
Subordinates	Q18	**0.829**	0.010	-0.083	-0.005	0.053	0.029
Subordinates	Q21	**0.828**	0.080	0.044	-0.001	-0.019	0.031
Subordinates	Q5	**0.823**	0.101	-0.028	0.040	-0.010	-0.150
Subordinates	Q20	**0.821**	0.013	-0.173	0.012	0.077	0.089
Subordinates	Q12	**0.814**	0.031	0.007	0.025	0.003	-0.064
Subordinates	Q30	**0.813**	-0.008	0.030	0.010	-0.014	0.031
Subordinates	Q9	**0.812**	0.083	-0.008	-0.045	-0.000	-0.034
Subordinates	Q16	**0.811**	0.027	0.015	0.017	-0.008	-0.128
Subordinates	Q2	**0.807**	-0.007	0.058	0.023	-0.032	-0.137
Subordinates	Q22	**0.807**	0.028	0.005	0.020	-0.028	0.076
Subordinates	Q24	**0.805**	0.042	-0.086	0.002	0.007	0.081
Subordinates	Q28	**0.789**	-0.021	0.066	-0.020	-0.056	0.094
Subordinates	Q15	**0.788**	0.060	0.100	-0.078	0.048	-0.083
Subordinates	Q13	**0.779**	-0.102	-0.004	0.009	0.038	0.213
Subordinates	Q32	**0.774**	0.032	-0.038	0.059	-0.053	0.096
Subordinates	Q17	**0.768**	0.046	-0.171	-0.042	0.070	-0.036
Subordinates	Q35	**0.765**	0.008	0.050	0.099	-0.090	0.103
Subordinates	Q37	**0.758**	-0.036	0.104	0.040	-0.052	0.084
Subordinates	Q19	**0.756**	0.061	-0.079	-0.048	0.070	0.016
Subordinates	Q14	**0.746**	-0.158	0.013	-0.013	0.062	0.236
Subordinates	Q10	**0.744**	0.052	-0.013	-0.031	0.136	-0.043
Subordinates	Q25	**0.744**	-0.169	-0.012	-0.012	0.057	0.184
Subordinates	Q33	**0.742**	0.017	0.026	0.088	-0.067	0.128
Subordinates	Q31	**0.736**	-0.049	-0.003	-0.036	0.031	0.234
Subordinates	Q7	**0.730**	0.009	-0.019	-0.042	0.168	-0.187
Subordinates	Q27	**0.729**	0.054	0.066	-0.041	-0.043	0.040
Subordinates	Q26	**0.688**	0.256	0.052	0.047	-0.125	-0.059
Subordinates	Q34	**0.684**	-0.104	-0.077	0.004	0.102	0.247
Subordinates	Q1	**0.669**	-0.009	0.059	0.252	-0.098	-0.264
Subordinates	Q40	**0.656**	-0.053	-0.005	-0.014	-0.084	0.131
Subordinates	Q29	**0.649**	0.235	-0.119	0.009	0.010	-0.136
Subordinates	Q3	**0.639**	-0.046	-0.070	0.290	-0.008	-0.210
Subordinates	Q39	**0.635**	-0.088	-0.039	-0.040	0.088	0.282
Subordinates	Q38	**0.478**	-0.324	0.054	-0.024	0.021	0.361
Superiors	Q28	0.102	**0.633**	-0.006	-0.032	0.020	0.039
Superiors	Q30	0.116	**0.603**	0.050	-0.071	0.109	0.056

Superiors	Q27	0.064	**0.482**	-0.028	-0.027	0.254	0.023
Superiors	Q23	0.041	**0.460**	0.097	0.122	0.018	0.050
Superiors	Q29	0.032	**0.457**	0.209	0.154	-0.108	0.106
Superiors	Q22	0.099	**0.435**	0.236	0.024	0.192	0.024
Superiors	Q24	0.147	**0.408**	0.007	0.168	-0.007	0.048
Superiors	Q31	0.211	**0.378**	0.207	-0.154	0.029	0.254
Superiors	Q40	0.058	**0.356**	0.194	-0.043	0.045	0.222
Superiors	Q25	-0.006	0.059	**0.626**	0.083	-0.032	0.004
Superiors	Q36	-0.020	0.107	**0.571**	-0.086	-0.042	0.109
Superiors	Q13	0.046	-0.090	**0.560**	0.169	0.104	-0.043
Superiors	Q17	0.008	-0.014	**0.545**	0.092	0.141	0.036
Superiors	Q12	-0.033	0.052	**0.467**	0.175	0.200	-0.079
Superiors	Q21	0.118	0.100	**0.442**	-0.094	0.204	0.083
Superiors	Q37	0.052	0.225	**0.442**	-0.059	0.064	0.078
Superiors	Q14	-0.029	0.145	**0.412**	0.138	0.110	-0.006
Superiors	Q15	0.075	0.003	**0.266**	0.060	0.201	-0.054
Superiors	Q1	-0.011	0.018	-0.009	**0.796**	-0.015	0.011
Superiors	Q2	0.024	-0.033	-0.042	**0.796**	-0.016	0.014
Superiors	Q4	-0.045	-0.095	0.020	**0.753**	0.063	0.052
Superiors	Q3	0.005	0.038	0.055	**0.708**	0.117	-0.010
Superiors	Q5	0.032	0.163	0.187	**0.416**	-0.079	0.040
Superiors	Q9	0.038	-0.054	0.079	**0.400**	0.350	0.039
Superiors	Q26	-0.004	0.277	0.317	**0.380**	-0.216	0.047
Superiors	Q19	0.075	0.120	0.281	**0.296**	-0.045	0.023
Superiors	Q7	0.027	0.337	-0.105	0.164	**0.547**	-0.055
Superiors	Q16	0.018	-0.088	0.341	0.038	**0.526**	-0.045
Superiors	Q18	-0.030	-0.049	0.301	0.096	**0.489**	0.004
Superiors	Q8	0.019	0.095	0.040	0.035	**0.470**	0.115
Superiors	Q10	-0.059	0.159	0.045	0.114	**0.453**	0.287
Superiors	Q11	0.079	-0.042	0.394	0.081	**0.448**	-0.045
Superiors	Q20	0.021	0.068	0.133	-0.125	**0.421**	0.095
Superiors	Q6	0.014	0.369	-0.020	0.206	**0.374**	-0.077
Superiors	Q32	0.095	0.285	0.078	0.012	0.071	**0.520**
Superiors	Q38	0.148	0.149	0.087	0.049	0.142	**0.485**
Superiors	Q34	0.077	0.387	0.137	0.061	-0.009	**0.417**
Superiors	Q33	0.075	0.165	0.091	-0.007	0.259	**0.406**
Superiors	Q35	0.118	0.147	0.091	0.185	-0.032	**0.331**
Superiors	Q39	0.047	-0.098	0.286	-0.175	0.180	**0.293**

Notes: The highest factor loading for each question is indicated in bold. Exploratory factor analysis is performed based on 954 manager × time observations. The principal factor method with quartimin oblique rotation is applied. Regarding manager skills representing each factor, see Table 2.

Table B2. Manager Skills and Subordinate Performance: Achievement Evaluation and Stretch Goal Evaluation

Dependent var.	*EvalA* (achievement evaluation)				*EvalSG* (stretch goal evaluation)			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Specification 1								
PMS_Up	**0.031***	**0.038***	**0.044***	0.027	**0.034****	**0.042****	0.027	0.031
	(0.017)	(0.021)	(0.022)	(0.025)	(0.015)	(0.017)	(0.019)	(0.019)
PerformMgmt	0.026	0.005	0.032	-0.004	-0.010	**-0.023***	0.005	-0.016
	(0.017)	(0.018)	(0.023)	(0.024)	(0.012)	(0.014)	(0.016)	(0.017)
Coordination	**-0.031***	-0.028	-0.021	-0.029	-0.015	-0.007	-0.018	-0.007
	(0.016)	(0.018)	(0.019)	(0.020)	(0.013)	(0.015)	(0.014)	(0.015)
MktAwareness	-0.008	-0.018	**-0.041****	-0.031	-0.016	**-0.027***	-0.019	-0.020
	(0.015)	(0.018)	(0.019)	(0.022)	(0.013)	(0.016)	(0.016)	(0.019)
PMS_Down	-0.017	-0.005	-0.010	-0.007	-0.011	0.005	**-0.024***	-0.019
	(0.015)	(0.018)	(0.019)	(0.021)	(0.011)	(0.012)	(0.013)	(0.014)
Specification 2								
PMS_Up	**0.035****	**0.040***	**0.045****	0.027	**0.034****	**0.041****	0.027	0.030
	(0.018)	(0.021)	(0.023)	(0.025)	(0.014)	(0.016)	(0.019)	(0.019)
SLS	-0.013	**-0.031****	-0.025	**-0.047****	**-0.030****	**-0.039*****	-0.025	-0.030
	(0.014)	(0.016)	(0.020)	(0.020)	(0.013)	(0.015)	(0.017)	(0.019)
PMS_Down	-0.017	-0.004	-0.005	-0.004	-0.011	0.005	**-0.022***	-0.018
	(0.015)	(0.018)	(0.018)	(0.021)	(0.011)	(0.012)	(0.013)	(0.014)
Subordinate FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Manager FE			Yes	Yes			Yes	Yes
Work unit FE		Yes		Yes		Yes		Yes
Observations	7,345	7,345	7,345	7,345	7,345	7,345	7,345	7,345
Subordinates	1,397	1,397	1,397	1,397	1,397	1,397	1,397	1,397
Managers	187	187	187	187	187	187	187	187

Notes: The same as in Table 4, except that the dependent variable is either achievement evaluation or stretch goal evaluation score. ***p < 0.01, **p < 0.05, *p < 0.1.

Table B3 Manager Skills and Manager's Own Performance: Achievement Evaluation and Stretch Goal Evaluation

Dep. Var.	***EvalA*** **(achivement evaluation)**				***EvalSG*** **(stretch goal evaluation)**			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Specification 1								
PMS_Up	0.054	**0.073***	**0.074***	0.063	**0.159*****	**0.155*****	**0.163*****	**0.173*****
	(0.034)	(0.038)	(0.044)	(0.051)	(0.026)	(0.029)	(0.037)	(0.042)
PerformMgmt	**0.179*****	**0.210*****	**0.173*****	**0.180*****	**0.082*****	**0.099*****	**0.066***	0.042
	(0.037)	(0.041)	(0.057)	(0.066)	(0.028)	(0.029)	(0.036)	(0.042)
Coordination	-0.030	-0.051	**-0.089***	**-0.119****	0.023	0.026	0.000	0.006
	(0.039)	(0.041)	(0.051)	(0.058)	(0.028)	(0.033)	(0.034)	(0.042)
MktAwareness	-0.018	0.032	-0.020	0.013	-0.015	0.008	-0.042	-0.028
	(0.032)	(0.037)	(0.038)	(0.050)	(0.026)	(0.026)	(0.031)	(0.034)
PMS_Down	0.004	0.009	-0.011	0.034	-0.001	-0.006	-0.029	-0.040
	(0.039)	(0.036)	(0.046)	(0.047)	(0.026)	(0.027)	(0.034)	(0.039)
Specification 2								
PMS_Up	**0.063***	**0.091****	**0.075***	0.064	**0.161*****	**0.161*****	**0.162*****	**0.174*****
	(0.034)	(0.038)	(0.045)	(0.053)	(0.026)	(0.030)	(0.037)	(0.043)
SLS	**0.082*****	**0.132*****	0.028	0.040	**0.059****	**0.096*****	0.010	0.016
	(0.029)	(0.035)	(0.040)	(0.053)	(0.025)	(0.031)	(0.037)	(0.044)
PMS_Down	-0.004	-0.013	-0.016	0.019	0.001	-0.009	-0.025	-0.038
	(0.038)	(0.035)	(0.045)	(0.045)	(0.027)	(0.028)	(0.035)	(0.039)
Manager FE			Yes	Yes			Yes	Yes
Superior dummies		Yes		Yes		Yes		Yes
Observations	909	899	909	899	909	899	909	899
Managers	182	180	182	180	182	180	182	180

Notes: The same as in Table 6, except that the dependent variable is either achievement evaluation or stretch goal evaluation score. ***p < 0.01, **p < 0.05, *p < 0.1.

Table B4. Manager Skills and Subordinate Performance with Subordinate×Manager FE

	(1)	(2)	(3)	(4)
Dependent var.	***Eval***	***EvalA***	***EvalSG***	***Retention***
Specification 1				
PMS_Up	**0.080****	**0.043***	0.037	0.014
	(0.039)	(0.026)	(0.023)	(0.010)
PerformMgmt	0.005	0.010	-0.006	-0.004
	(0.034)	(0.028)	(0.019)	(0.007)
Coordination	-0.044	-0.021	-0.022	0.007
	(0.027)	(0.022)	(0.018)	(0.005)
MktAwareness	**-0.062****	**-0.059****	-0.004	**-0.015****
	(0.029)	(0.023)	(0.018)	(0.007)
PMS_Down	-0.039	-0.026	-0.012	0.001
	(0.028)	(0.021)	(0.016)	(0.005)
Specification 2				
PMS_Up	**0.080****	0.042	**0.038***	0.013
	(0.040)	(0.026)	(0.023)	(0.010)
SLS	**-0.074*****	**-0.050****	(0.024)	(0.007)
	(0.027)	(0.022)	(0.020)	(0.006)
PMS_Down	-0.033	-0.019	-0.012	0.002
	(0.028)	(0.020)	(0.016)	(0.005)
Subordinate*Manager FE	Yes	Yes	Yes	Yes
Observations	5,878	5,900	5,900	5,577
Subordinates	1,250	1,256	1,256	1,244
Managers	153	153	153	152

Notes: Other control variables are the same as in column (3) in Tables 4 or B2. Robust standard errors clustered by subordinate and manager are in parentheses. ***p < 0.01, **p < 0.05, *p < 0.1.

Table B5. Checks for Assignment Bias: Whether Managers with Increased Skills are Assigned to Subordinates with Positive (Negative) Shocks

	Eval		*EvalA*		*EvalSG*	
	(1)	(2)	(1)	(2)	(1)	(2)
Specification 1						
PMS_Up (future)	-0.018	0.000	0.005	0.015	-0.023	-0.015
	(0.049)	(0.048)	(0.040)	(0.040)	(0.026)	(0.026)
PerformMgmt (future)	0.036	0.044	0.013	0.013	0.024	0.031
	(0.046)	(0.045)	(0.041)	(0.040)	(0.026)	(0.026)
Coordination (future)	-0.004	0.014	0.025	0.032	-0.029	-0.018
	(0.051)	(0.053)	(0.041)	(0.044)	(0.027)	(0.027)
MktAwareness (future)	0.051	**0.083***	**0.079***	**0.095****	-0.028	-0.013
	(0.045)	(0.044)	(0.044)	(0.042)	(0.024)	(0.024)
PMS_Down (future)	0.059	**0.091****	0.046	**0.069***	0.013	0.022
	(0.043)	(0.042)	(0.039)	(0.037)	(0.025)	(0.026)
Specification 2						
PMS_Up (future)	-0.016	0.000	0.001	0.009	-0.016	-0.009
	(0.047)	(0.046)	(0.040)	(0.040)	(0.025)	(0.024)
SLS (future)	0.056	**0.099****	**0.085****	**0.104*****	-0.029	-0.005
	(0.042)	(0.041)	(0.037)	(0.037)	(0.025)	(0.024)
PMS_Down (future)	0.060	**0.090****	0.043	**0.064***	0.017	0.026
	(0.043)	(0.042)	(0.038)	(0.036)	(0.025)	(0.026)
Subordinate FE	Yes	Yes	Yes	Yes	Yes	Yes
Future manager FE	Yes	Yes	Yes	Yes	Yes	Yes
Current manager controls		Yes		Yes		Yes
Observations	2,431	2,314	2,431	2,314	2,431	2,314
Subordinates	759	723	759	723	759	723
Future managers	161	155	161	155	161	155

Notes: Subordinate *i*'s performance evaluation variables are regressed on the skills of the future manager who is not *i*'s current manager but will be assigned to *i* in the next period. "Current manager controls" are manager characteristics mentioned in Table 4, except that team assessment skills are those of the future manager. Other control variables (subordinate characteristics and group firm affiliation dummies) are the same as those in Table 4. Robust standard errors clustered by subordinate and future manager are in parentheses. ***p < 0.01, **p < 0.05, *p < 0.1.

Table B6. Manager Skills and Subordinate Performance: Time × Business Area Dummies Controlled

Dependent var.	*Eval* (overall performance evaluation)		*Retention*	
	(1)	(2)	(1)	(2)
Specification 1				
PMS_Up	**0.054****	**0.050***	0.007	0.007
	(0.022)	(0.029)	(0.005)	(0.006)
PerformMgmt	0.035	**0.060****	-0.001	-0.006
	(0.021)	(0.028)	(0.004)	(0.005)
Coordination	-0.032	-0.024	**0.009****	**0.009****
	(0.020)	(0.022)	(0.004)	(0.005)
MktAwareness	-0.004	-0.022	-0.007	**-0.011****
	(0.017)	(0.021)	(0.004)	(0.005)
PMS_Down	-0.019	-0.022	-0.005	-0.002
	(0.017)	(0.021)	(0.003)	(0.004)
Specification 2				
PMS_Up	**0.059*****	**0.052***	0.006	0.005
	(0.023)	(0.029)	(0.005)	(0.006)
SLS	-0.005	0.004	0.002	-0.004
	(0.015)	(0.024)	(0.004)	(0.006)
PMS_Down	-0.020	-0.017	-0.003	-0.001
	(0.017)	(0.020)	(0.003)	(0.004)
Subordinate FE	Yes	Yes	Yes	Yes
Manager FE		Yes		Yes
Time x business area FE	Yes	Yes	Yes	Yes
Observations	7,320	7,320	6,705	6,705
Subordinates	1,390	1,390	1,349	1,349
Managers	187	187	175	175

Notes: The same as in columns (1) or (3) of Table 4, except that time × business area dummies are controlled for instead of time and group firm affiliation dummies. There are six business areas (when the dependent variable is *Eval*).

Table B7. Manager Skills and Manager's Own Performance: Controlling for Expectation Scores for Manager Skills

	Eval				*PromoteJT*			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Specification 1								
PMS_Up	**0.218*** **	**0.212*** **	**0.228*** **	**0.205*** **	0.011	0.002	-0.008	-0.022
	(0.046)	(0.049)	(0.057)	(0.066)	(0.011)	(0.014)	(0.016)	(0.020)
PerformMgmt	**0.239*** **	**0.294*** **	**0.224*** **	**0.221*** **	0.016	0.013	0.011	0.026
	(0.051)	(0.053)	(0.069)	(0.080)	(0.011)	(0.014)	(0.015)	(0.018)
Coordination	-0.001	-0.018	-0.073	-0.101	**0.021***	**0.023***	0.009	0.009
	(0.048)	(0.051)	(0.064)	(0.073)	(0.011)	(0.012)	(0.017)	(0.018)
MktAwareness	-0.027	0.052	-0.059	-0.004	-0.009	0.004	-0.017	0.005
	(0.043)	(0.044)	(0.047)	(0.061)	(0.012)	(0.015)	(0.017)	(0.023)
PMS_Down	0.004	-0.004	-0.039	-0.007	-0.002	-0.009	0.008	0.008
	(0.044)	(0.041)	(0.054)	(0.057)	(0.010)	(0.012)	(0.015)	(0.017)
Specification 2								
PMS_Up	**0.228*** **	**0.233*** **	**0.237*** **	**0.214*** **	0.010	0.004	-0.009	-0.023
	(0.046)	(0.050)	(0.058)	(0.067)	(0.011)	(0.014)	(0.016)	(0.020)
SLS	**0.134*** **	**0.235*** **	0.037	0.070	**0.022** **	**0.036*** **	0.006	**0.036***
	(0.041)	(0.046)	(0.058)	(0.072)	(0.011)	(0.014)	(0.014)	(0.018)
PMS_Down	0.000	-0.027	-0.040	-0.018	0.000	-0.006	0.008	0.012
	(0.046)	(0.043)	(0.055)	(0.057)	(0.010)	(0.012)	(0.015)	(0.017)
Manager Skill Expectation Scores	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Manager FE			Yes	Yes			Yes	Yes
Superior dummies		Yes		Yes		Yes		Yes
Observations	905	895	905	895	809	799	809	799
Managers	182	180	182	180	170	169	170	169

Notes: The same as in Table 6, except that expectation scores for each manager skill variable are controlled for. For the computation of expectation scores, see the notes in Figure 1. ***p < 0.01, **p < 0.05, *p < 0.1.

Table B8. Manager Skills and Manager's Own Performance: Controlling for Superiors' Overall Satisfaction with Close Support from Manager (*Supportive*)

	Eval				***PromoteJT***			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Specification 1								
PMS_Up	**0.207*** **	**0.209*** **	**0.225*** **	**0.223*** **	0.008	0.005	-0.017	-0.020
	(0.042)	(0.047)	(0.055)	(0.061)	(0.010)	(0.012)	(0.016)	(0.017)
PerformMgmt	**0.240*** **	**0.259*** **	**0.217*** **	**0.183** **	0.017	0.022	0.012	0.029
	(0.055)	(0.057)	(0.072)	(0.084)	(0.012)	(0.013)	(0.016)	(0.019)
Coordination	-0.012	-0.044	-0.092	**-0.125***	**0.024** **	**0.027** **	0.010	0.015
	(0.049)	(0.053)	(0.063)	(0.074)	(0.011)	(0.012)	(0.016)	(0.018)
MktAwareness	-0.039	0.029	-0.068	-0.021	-0.009	0.002	-0.019	-0.002
	(0.043)	(0.044)	(0.048)	(0.061)	(0.012)	(0.015)	(0.018)	(0.024)
PMS_Down	-0.002	-0.004	-0.045	-0.015	-0.002	-0.007	0.005	0.013
	(0.043)	(0.039)	(0.054)	(0.055)	(0.010)	(0.013)	(0.016)	(0.018)
Supportive	0.038	**0.114** **	0.048	**0.104***	0.001	-0.004	0.010	0.005
	(0.046)	(0.047)	(0.055)	(0.056)	(0.011)	(0.012)	(0.014)	(0.013)
Specification 2								
PMS_Up	**0.207*** **	**0.221*** **	**0.217*** **	**0.221*** **	0.006	0.004	-0.019	-0.021
	(0.042)	(0.048)	(0.055)	(0.062)	(0.010)	(0.012)	(0.016)	(0.018)
SLS	**0.092** **	**0.146*** **	0.000	0.003	**0.021***	**0.037*** **	0.000	0.029
	(0.046)	(0.054)	(0.063)	(0.077)	(0.011)	(0.013)	(0.015)	(0.019)
PMS_Down	-0.011	-0.030	-0.047	-0.029	0.001	-0.004	0.007	0.014
	(0.044)	(0.041)	(0.055)	(0.056)	(0.010)	(0.012)	(0.016)	(0.017)
Supportive	**0.095** **	**0.161*** **	0.089	**0.136** **	0.004	-0.002	0.013	0.009
	(0.045)	(0.048)	(0.055)	(0.056)	(0.010)	(0.011)	(0.013)	(0.013)
Manager FE			Yes	Yes			Yes	Yes
Superior dummies		Yes		Yes		Yes		Yes
Observations	905	895	905	895	809	799	809	799
Managers	182	180	182	180	170	169	170	169

Notes: The same as in Table 6, except that *Supportive*, which is superiors' overall satisfaction score for the close support from managers, is controlled for. ***p < 0.01, **p < 0.05, *p < 0.1.