Promotions as implicit incentives for human capital acquisition

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May 2016

This paper has benefited from comments by John Christensen, Martin Holzhacker, Stijn Masschelein, Marshall Vance, Michael Waldman, and seminar participants at Erasmus University Rotterdam, The joint accounting seminar series of ESADE-IESE-UPF in Barcelona, Harvard University, The Goethe University Frankfurt, The University of Luxembourg, The University of Melbourne, University of Southern Denmark (Odense), University of Technology at Sydney, Vienna University of Economics and Business, the 2014 Midyear Meeting of the AAA Management Accounting Section, the 9th Conference on New Directions in Management Accounting, and the 2016 Global Management Accounting Research Symposium.

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Abstract

The importance of human capital in building and maintaining competitive advantage is undisputed, and ensuring that employees invest in their human capital has thus become of utmost importance to firms. Despite this, management accounting research has not dedicated much attention to the control mechanisms that aim at upgrading the effective ability of employees, i.e., training and assignment of employees. In this study, we investigate the complementary roles of training and promotions in the active management of employees' human capital acquisition. In particular, based on a simple theoretical framework, we predict that promotion opportunities create implicit incentives to invest in task-specific human capital. To test this prediction, we develop an identification strategy to estimate the causal effect of promotion opportunities on the acquisition of task-specific human capital. Using panel data of a retail bank, we provide evidence that, in contrast to bonus-based incentives, which focus on the current job, promotion is an ideal mechanism to incentivize the acquisition of human capital that is relevant for the next job, especially when these skills are not yet relevant in the current job.

Key words: *implicit incentives, human capital acquisition, training, promotions*

1. Introduction

Performance measurement and incentives is an important and widely studied area in managerial accounting. This literature has examined the design of pay-for-performance mechanisms with a focus on how these mechanisms affect effort provision and thus productivity. However, productivity is much more complex than just being a function of effort. It also depends on the skills and talents people have. That is, productivity can not only be increased by means of putting in more effort, but also by investments in human capital. Firms are therefore not only interested in incentivizing employees to provide effort, but also to invest in the acquisition of productivity-enhancing skills.

The importance of human capital to build or maintain competitive advantage has been widely recognized. Knowledge has become a unique organizational resource that plays a major role in creating firm value and this knowledge predominately resides within employees (Grant, 1996; Hatch and Dyer, 2004). Ensuring that employees invest in their human capital has thus become of utmost importance to firms. The problem is that, as with effort, human capital acquisition is costly and non-contractible. While the effort problem is typically mitigated by the use of performance-based pay, this tool is less effective for incentivizing human capital acquisition for two reasons. First, effort is always relevant for performance in the current job but this is not necessarily true for human capital because skills are task-specific (e.g., Gibbons and Waldman, 2004; 2006; Gathmann and Schoenberg, 2011). Second, while effort provision has a relatively transitory effect on performance, human capital accumulates and its acquisition has therefore a more permanent effect on performance. We exploit these differences and investigate the role of promotions in providing implicit incentives for human capital acquisition.

While the management accounting literature has remained silent on the issue of employee training, or human capital acquisition more generally, the labor economics literature on

promotion dynamics within firms has addressed this issue in depth. In this literature, human capital acquisition is assumed to increase effective ability, and promotions are the result of the acquisition of human capital that is more productive at higher levels on the job ladder (Gibbons and Waldman, 1999; 2006; Prendergast, 1993). An important question in this respect is whether the human capital acquisition is itself affected by the promotion opportunities or that there are other mechanisms that drive this acquisition. That is, do promotions opportunities provide incentives for human capital acquisition? This is not only an important question from a pure labor economics perspective, but even more so from a management control perspective. The reason for this is that an affirmative answer implies the active management of the two personnel control mechanisms training and job assignment. It is therefore important to evaluate whether promotions are indeed designed to provide incentives for human capital acquisition. As a result, we use the insights from the labor economics literature on human capital acquisition, and in particular on the use of promotions to induce these investments, to empirically examine the personnel control mechanisms training and job assignment.

An important characteristic of human capital is that it relates to a capital stock of skills that is task-specific (e.g., Gibbons and Waldman, 2004; 2006; Gathmann and Schoenberg, 2011). The concept of task-specific skills implies that each job within a job ladder is characterized by a specific weighting of general skills, i.e., a specific skill set (Lazear, 2009). By using a promotion rule that sorts employees based on task-specific skills and makes promotion more likely if employees acquire these skills, employees have the incentive to invest. Because job assignments differ in the extent to which the nature of the tasks between the current job and the next job varies (e.g., Grabner and Moers 2013b), the degree to which the relevant skill set changes upon promotion depends on the type of job assignment. When the tasks between the current job and the next job are similar (different), the relevant skill set for each job will also be similar (different).

The sorting role of promotions therefore implies that different types of promotions provide incentives for the acquisition of different types of skill sets. More importantly, it implies that promotions provide incentives to invest in skills that are relevant in the next job, irrespective of whether these skills are also relevant in the current job. In Section II we formally derive these predictions using a simple theoretical framework.

To empirically address the above prediction, we use panel data on employees working in a network of branch offices of a retail bank. We have detailed data on the amount and the type of training each employee took, and we are further able to distinguish four types of job assignments across the hierarchy: The four classes differ in the extent of change in the nature of tasks between hierarchical levels, which increases monotonically. This information allows us to categorize training in terms of their relevance for different types of job assignments, i.e., whether or not they increase the effective ability for a particular job.

To directly test our hypothesis, we develop an identification strategy to estimate the causal effect of promotion opportunities on human capital acquisition. Using an efficient two-step General Method of Moments (IV-GMM) estimator, we find that employees who are presented with an opportunity to get promoted to a similar task environment invest more in training that is relevant in the current job, which is in this case also relevant in the next job, than when not presented with such an opportunity. In contrast, employees who are presented with an opportunity to get promoted to a different task environment invest more in training that is only relevant in the next job than when not presented with such an opportunity. These results are robust to different definitions of the absence and presence of promotion opportunities, as well as to a measure that reflects the extent of the opportunities (intensity of treatment). Overall, our results provide strong support for the prediction that promotions provide implicit incentives for human capital acquisition.

We contribute to the accounting and economics literature on human capital acquisition and promotions in several related ways. First, while human capital acquisition and matching employees to jobs via promotions are critical decisions for organizational success, the literature on the relation between the two has been primarily theoretical in nature. To the best of our knowledge, we provide the first empirical evidence of promotions that are used for sorting purposes inducing human capital investments.[2] While the incentive and sorting roles of promotions can be conflicting when it comes down to the provision of effort incentives (Baker, Jensen, and Murphy, 1988; Grabner and Moers, 2013b), we provide empirical evidence that the incentive and sorting roles are linked when it comes down to human capital acquisition.

Second, our findings are related to the Baker et al. (1988) puzzle of why promotions are used as incentive device rather than using solely pay-for-performance schemes such as bonuses. Our results suggest that human capital incentives rather than effort incentives are the main benefit of promotions. In contrast, effort incentives rather than human capital incentives are the main benefit of pay-for-performance schemes. As such, one reason for the apparent puzzle is that promotions are an efficient way to provide incentives for the accumulation of a type of human capital for which bonuses are a poor incentive device.

Third, we extend the accounting literature on performance measurement and incentives by going beyond effort. Although the moral hazard problem regarding the provision of effort is undoubtedly important, firms are confronted with other, equally important incentive problems that have been somewhat neglected in the accounting literature. We argue and show that the characteristics of the incentive problem of human capital acquisition differ from those of the

[2] Pergamit and Veum (1999) and Melero (2010) provide evidence of an association between training and promotions, a necessary but not sufficient condition for promotions to induce human capital investment. However, both studies use surveys with self-reported measures of training and promotions where it is not clear whether the job changes really reflect promotions (see e.g., Pergamit and Veum, 1999). More importantly, neither study examines whether promotion opportunities indeed trigger human capital investments, which is the core of our study.

typical moral hazard problem and that these differences affect the effectiveness of bonus-based incentives versus promotion-based incentives.

Fourth, we extend our understanding of the role of personnel controls in the design of management control systems. Although accounting textbooks have stressed the importance of personnel controls to ensure that employees have the right qualifications to fulfill their job requirements (see e.g., Merchant and Van der Stede, 2012), research on these controls is still scarce (exceptions are Campbell, 2008; 2012 and Grabner and Moers; 2013b). Similarly, Kaplan and Norton (1996) have identified the capabilities of employees as important intangible assets that build the foundation of future firm performance. However, research on the balanced scorecard has largely neglected the learning and growth perspective, and focused on the management of efficiency and customer satisfaction instead. Relatedly, we contribute to the recent stream of literature on the interdependence between management control mechanisms (see Grabner and Moers (2013a) for a discussion). Given that training and job assignment are personnel controls that can be actively managed, our results imply that investments in promotion systems that improve matching and investments in training programs are complements. These results are important to improve our understanding of what constitutes a management control system.

Finally, our categorization of training and associated empirical results provide support for the concept of task-specific skills. While the distinction between general and firm-specific skills can easily be made conceptually, it has been shown to be difficult to provide meaningful real-life examples. Our study shows that task-specific skills capture important aspects of the original concept of firm-specific skills and are also empirically relevant, which makes it a fruitful area for future research (see also Gibbons and Waldman, 2006).

The remainder of our paper is structured as follows. Section two discusses the theoretical insights regarding human capital acquisition and promotions, and formulates our hypothesis. Section three introduces our empirical setting and describes data and measures. Section four describes our empirical tests, reports the findings, and discusses the results. Section five concludes.

2. Theory and hypothesis development

The accounting literature has largely recognized the power of effort incentives to align employees' behavior with the objectives of the firm (e.g., Bushman, Indejejikian, and Smith, 1995; 1996; Ittner, Larcker, and Rajan, 1997). The typical incentive studies are rooted in the incentive contracting literature where the focus is on the provision of (implicit and explicit) incentives to increase or maintain effort in the current job to maximize productivity. This literature has largely ignored that productivity can not only be increased by means of putting in more effort, but also by investments in the acquisition of human capital that increase productivity given a certain level of effort. Below we provide a simple theoretical framework to analyze the role of explicit (bonuses) and implicit (promotions) incentives for human capital acquisition.

Our framework combines insights from Gibbs (1995), Gibbons and Waldman (2006), Lazear (2009), and Grabner and Moers (2013b). Different jobs pose different requirements on the employees and these different requirements are reflected in different task-specific skills. While similar types of skills might be needed across different jobs within a particular job ladder, it is the combination and weighting of these skills that make the required human capital specific to the tasks of a particular job. This implies that each job within a job ladder is characterized by a specific weighting of general skills, i.e., a skill set (Gibbons and Waldman, 2006, see also Lazear,

2009).[3] For example, while always being part of an academic's job, the development of technical (econometrics and writing) skills is relatively more important in earlier stages of the career, and MBA teaching skills or project and resource acquisition skills increase in relevance in later years. Following Lazear (2009), we model task-specific skills as a task-specific weighting of general skills. In particular, let there be two skills, A and B; the relevant skill set $\kappa(A, B)$ for task *j* equals

$$\kappa_j = \lambda_j A + \left(1 - \lambda_j\right) B \tag{1}$$

with $0 \leq \lambda_j \leq 1$.

The idea of task-specific human capital implies not only that investments in skills that increase current productivity might become obsolete in a new job, but also that the opposite holds: some skills do not increase productivity in the current job, but become relevant in the next job. Job assignments differ in the extent to which the nature of the tasks between the current job and the next job varies, i.e., the extent to which talents for the next level in the hierarchy are correlated with talents required to be the best performer in the current job (Baker et al., 1988, Grabner and Moers, 2013b). Consistent with Grabner and Moers (2013b), we assume that an employee has task-specific ability, which we model here in terms of task-specific effective ability. More specifically, assume that employee *i* has innate ability α_i. Both the firm and the employee do not know α_i *ex ante*, but it is common knowledge that α is normally distributed with mean $\overline{\alpha}$ and variance σ_α^2. An employee's effective ability for task *j* is then given by (dropping subscript *i*)

$$\eta_j = (1 + \kappa_j)\alpha \tag{2}$$

and an employee's performance on task *j* by

[3] Although jobs within a job ladder require different skill sets, it is important to note that jobs within one job ladder are more similar to each other than to jobs in another job ladder. This implies that the acquired skills are more likely to become obsolete when moving out of a particular job ladder.

$$y_j = \eta_j + \varepsilon_j \tag{3}$$

with $\varepsilon_j \sim N(0, \omega_j^2)$ and independent of α. The employee's innate ability thus impacts the effectiveness of the skill set.

To examine the impact of alternative job assignments, we model the skill set relevant for the tasks in the current job as (subscript *c*)

$$\kappa_c = \lambda A + (1 - \lambda)B \tag{4}$$

and the skill set relevant for the tasks in the next job as (subscript *n*)

$$\kappa_n = (\lambda - \delta)A + (1 + \delta - \lambda)B \tag{5}$$

with $0 \leq \delta \leq \lambda$; the higher δ the greater the change in the relevant skill set upon promotion. For example, if a sales manager that is responsible for one region completes training on customer service, this acquired skill will be equally relevant when promoted to a sales manager responsible for multiple regions ($\delta \approx 0$). However, as soon as the nature of the tasks starts to vary between different hierarchical levels, productivity in the current job becomes less important for the next job, and other skills become (more) relevant ($\delta > 0$). For example, a sales employee that already has acquired leadership skills is more likely to be suited to be a store manager than somebody that has no leadership experience.

Whether or not the employee makes human capital investments and acquires task-specific human capital depends on the associated costs and benefits. Regarding the former, we interpret skills *A* and *B* as observable, but non-contractible investments in different types of training, the costs of which are

$$C(A, B) = \frac{1}{2}(A^2 + B^2) \tag{6}$$

Regarding the latter, we assume that the employee receives the following bonus-based incentives

$$s(y_c) = w + \beta \cdot y_c \tag{7}$$

In addition, the employee has the opportunity to receive a promotion, after which the present value of lifetime earnings increases by Δ (cf. Gibbs, 1995). Of particular interest here is the probability of promotion. Following Grabner and Moers (2013b), we assume that the firm sorts employees on the expected (effective) ability for the tasks relevant in the next job and promotes the employee as soon as this expectation exceeds a standard z (cf. Gibbs, 1995). That is,

$$Prob(Promotion) = Prob(E[\eta_n|y_c, A, B] > z) = 1 - \Phi(z) \tag{8}$$

where $E[\eta_n|y_c, A, B] \sim N(\mu_\eta, \sigma_\eta^2)$ with $\mu_\eta = (1 + \kappa_n)\overline{\alpha}$. The employee thus maximizes the following expected utility

$$EU = w + \beta([1 + \lambda A + (1 - \lambda)B]\overline{\alpha}) + \big(1 - \Phi(z)\big)\Delta - \frac{1}{2}(A^2 + B^2) \tag{9}$$

The optimal human capital investments by the employee are therefore represented by

$$A^* = \lambda\beta\overline{\alpha} + (\lambda - \delta)\phi(z)\Delta\overline{\alpha} \tag{10}$$

$$B^* = (1 - \lambda)\beta\overline{\alpha} + (1 + \delta - \lambda)\phi(z)\Delta\overline{\alpha} \tag{11}$$

where in both cases the first term reflects the bonus-based incentives and the second term the promotion-based incentives.

What becomes obvious from these optimal employee responses is that the bonus-based incentives are scaled by the skill weights specific to the tasks in the current job, i.e., λ and $(1 - \lambda)$. Thus, only skills that are to some extent relevant in the current job are incentivized by bonuses. The promotion-based incentives on the other hand are scaled by the skill weights specific to the tasks in the next job, i.e., $(\lambda - \delta)$ and $(1 + \delta - \lambda)$. That is, in contrast to annual bonuses, promotions provide incentives to invest in those training programs that are relevant for the next job position, irrespective of whether these skills are directly relevant in the current job. The following hypothesis summarizes this expectation.

Hypothesis: Promotions provide incentives to increase investments in training relevant to the tasks in the next job.

3. Research setting and measures

We use the same research site as the one used in Grabner and Moers (2013b) and, for completeness, we reproduce verbatim some of the paragraphs in Grabner and Moers (2013b) that describe the research setting. Our research site is the national operation of a multinational bank – referred to as "BANK". Although BANK's operations include investment banking and commercial banking, the core competency and business focus has remained retail banking. As a consequence, the network of branch offices is a key resource of the company and of utmost importance for the company's performance. Our analysis exclusively focuses on this network of branch offices, which is organized in four management levels. Each branch is managed by a branch manager, who is responsible for up to 15 employees. The branch manager reports to a group manager, who is responsible for multiple branches. The group manager reports to a regional manager, who is responsible for multiple groups. The regional manager reports directly to the head of the sales division who is part of the executive board.

In each branch, the branch manager is responsible for the personal and professional development of his employees, i.e., recognizing potential and supporting the employee in devising the development strategy (incl. training program), as well as annual performance evaluations where progress is monitored. Group managers are responsible for strategic personnel management (personnel requirements and budgets). Thus, decisions regarding promotion slots are left to the group managers, whereas decisions on who to promote are made in consultation with the respective branch managers.

3.1. Training at bank

BANK puts great emphasis on encouraging employees to acquire human capital. This emphasis is reflected in a sub-division of the HR department dedicated to personnel development and an in-house training academy that (1) offers a wide range of training to employees at all levels in the firm, and (2) supports employees in identifying external training opportunities if the desired type of training is not offered internally. The employees themselves are responsible for designing their individual training programs based on an exhaustive list of training provided by the personnel development manager. Typically, the individual development strategy is discussed with the immediate supervisor, i.e., the branch manager, during the annual performance evaluation meeting.

Among all the training available, we are able to distinguish three categories that can be directly linked to our theory: (1) product training, (2) leadership training, and (3) management training.[4] Product training (e.g., loans for SMEs, security trading, life insurances) aims at increasing employees' understanding of the different products in BANK's portfolio, including product characteristics, target customers, and the interrelation with other products. Leadership training targets the development of personnel-oriented leadership skills, such as conflict management, diversity management, motivation of employees, and the leader's role in personnel development. Management training focuses on the development of process-oriented management skills, such as strategic management, quality management, or branch management using KPIs.

For each combination of hierarchical level and training type, we are able to assess whether the respective training should enhance performance in the current job, develop the skills necessary for a future job, or both, the details of which we present at the end of the next section.

[4] We exclude training that cannot be clearly assigned to a specific group or for which it is not possible to establish whether they are more relevant for the current or the next job.

This assessment, as well as the training classification, was corroborated by the Head of Human Resources as well as the Personnel Development Manager. Interviews with the Head of Human Resources and the Head of Sales also confirmed that (1) it is indeed the employees that have to take the initiative for their own training programs, and (2) there are no formal training requirements with respect to our training categories that employees have to fulfil in order to be eligible for a promotion. Further, branch managers are instructed to support their employees' training initiatives. Interestingly, in these interviews, the Head of Human Resources and the Personnel Development Manager independently of each other admitted challenges in incentivizing employees to invest in their human capital. Both executives expressed their surprise and disappointment that not all employees make use of the extensive training offer to the extent that BANK would want them to, despite the fact that BANK is actively pushing their employees to make use of the training opportunities in various ways, for example by actively encouraging supervisors to support their subordinates' selected training programs or adapting the training schedule to the preferences of the participants. Confronted with the question of why these training types are not made mandatory if BANK considers training to be so important, the executives (1) indicated that there is already some mandatory training that is required by regulations in the banking industry or BANK headquarters[5], and (2) expressed their believe that forcing employees to attend a training per se would not ensure the acquisition of skills if the employee is not motivated to learn, and thus would be a waste of time and money.

[5] The mandatory training required by headquarters addresses general standards with respect to customer service to ensure a consistent appearance to the market as a brand.

3.3. Job positions at bank

According to its hierarchical customer segmentation model, BANK has three customer categories within the branch network (standard customers; wealthy customers; commercial customers), each of which is further organized in a hierarchical model of job types reflecting the job ladders (junior employees; professional employees; senior employees). The combination of a customer category being served and a job type determines the hierarchical level of a particular employee. Panel A of Table 1 summarizes the most important variables that we use to describe the hierarchy at BANK, while Panel B of Table 1 presents the internal job rating system.

---------- Insert Table 1 ----------

For employees with no or limited experience in the banking sector, the entry level is the standard customer category, wherefrom employees can advance within the customer category or move to a higher-level one. An analysis of job descriptions and interviews with key managers allows us to classify the different promotion opportunities. Consistent with our theoretical framework, promotion opportunities can be classified according to the change in task environment between hierarchical levels, i.e., promotions to jobs with comparable tasks between hierarchical levels (which we label Type S promotions for similar tasks; $\delta = 0$ in terms of our model) and promotions that involve a significant change in the nature of the task (Type D promotions for different tasks; $\delta > 0$).

Advancement from the junior to the professional level within each customer category can be categorized as Type S promotions, as these do not involve a major change in tasks and responsibilities. Usually, these promotions entail increases in the employee's customer base and increased decision rights regarding the same tasks such as granting and structuring of customer loans/investments. In contrast, advancement to the senior level within the same customer

category or to junior/professional positions in higher-level customer categories involve significant changes in the task environment for the promoted employees. Promotions across customer categories, which we label "cross promotions", require more specialized product knowledge as well as more advanced customer management skills. Promotion from (mostly) professionals to seniors within the same customer category, which we label "senior promotions", is a highly competitive promotion based on an employee's ability to serve as a role model and mentor for junior employees. With an average firm tenure of more than 10 years upon promotion, seniors have internalized the company values and are expected to transfer these to the junior employees they are responsible for, as well as support them in their training and career development initiatives. This is also the first job position in the hierarchy that contains managerial tasks. Professionals and seniors can further advance to the position of the branch manager (supervisor) if they have acquired at least 3-5 years of industry-specific work experience and shown leadership skills.[6] This promotion, which we label "supervisor promotions", involves a drastic change in the nature of tasks, especially for professionals.[7]

We further order the different types of Type D promotions based on the underlying levels of the change in the nature of tasks. In particular, senior promotions involve a greater change in the nature of tasks compared to cross promotions, while supervisor promotions involve a greater change compared to both cross and senior promotions ($\delta_{CROSS} < \delta_{SENIOR} < \delta_{SUPERVISOR}$ in terms of our model).

[6] We also observe 5 promotions from junior positions to branch managers. These are employees who at the time of promotion are juniors in the highest customer category and had been professionals in lower-level customer categories before.

[7] To be complete, branch employees can also be promoted to expert positions (who specialize in one particular product group) outside the net of branch offices. Given that this is not part of the typical job ladder within a branch, we do not make specific predictions regarding these expert promotions, and therefore do not include them in our subsequent analysis.

Based on this classification of promotion opportunities, we assess the relevance of the respective training types for current vs. next job performance. For junior employees with Type S promotion opportunities, product training is equally relevant for both the current and the next job, while leadership and management training are not relevant. The same predictions hold for professional employees with Type D-cross promotion opportunities, although to a lesser extent. For professional employees with Type D-senior promotion opportunities, product training is more relevant for the current than the next job, while leadership training is only relevant at the next job. Management training is not yet relevant. For professional employees with Type D-supervisor promotion opportunities, product training is only relevant for the current job, while leadership training and management training are only relevant for the next job.

If we position the above discussion in our theoretical framework, then *A* captures product training and *B* captures leadership and management training. Given that the importance of *A* (*B)* for the promotion decision decreases (increases) with increases in δ, this implies that product training (leadership/management training) becomes less (more) of a predictor of the promotion decision as we move from a Type S promotion to a Type D-supervisor promotion. Furthermore, for the Type S promotion group, $\lambda = 1$ and $\delta = 0$, while for the Type D promotion group, $\lambda = 1$ and $\delta > 0$. The expected effects of incentives on human capital acquisition for the two groups, as reflected in their optimal responses, are therefore

Type S:

$$A^* = \beta\overline{\alpha} + \phi(z)\Delta\overline{\alpha} \tag{12a}$$

$$B^* = 0 \tag{12b}$$

Type D:

$$A^* = \beta\overline{\alpha} + (1-\delta)\phi(z)\Delta\overline{\alpha} \tag{13a}$$

$$B^* = \delta\phi(z)\Delta\overline{\alpha} \tag{13b}$$

That is, for the Type S group, bonuses and promotion opportunities trigger investments in product training but have no effect on leadership and management training. For the Type D group, bonuses and to some extent promotion opportunities trigger investments in product training, while only promotion opportunities trigger investments in leadership and management training.

3.4. Performance measurement at bank

BANK's performance measurement system is primarily based on the computer-supported tracking of sales performance. The system keeps record of individuals' annual sales targets, actual results, and target achievement rates on the set of sales measures. Performance management at BANK is a centralized function, thus neither managers nor supervisors in the branch network are involved in the measurement process.

At the beginning of the year sales employees are assigned individual performance targets with respect to the core products they sell. Targets are set top down by the performance management department and based on customer category, job type, as well as a market factor depending on location and size of the branch office. Employees do not participate in the target setting process and supervisors cannot change the targets assigned to their employees, neither *ex ante* nor *ex post*. The supervisors' targets equal the accumulated targets of their employees, thus they are held accountable for the target achievement of their subordinates. The same holds for the group managers, who are held accountable for the accumulated targets of the branches under their control.

3.4.1. Performance Evaluation.. The performance evaluation process for sales employees is highly formalized and closely monitored by the HR department to ensure compliance and

consistency. The performance evaluation process is based on individual performance appraisal meetings between employee and supervisor, and organized in a three-step approach. In the meeting at the beginning of the year, the objective sales targets are communicated and targets regarding personal (career) development are negotiated. After 6 months, a performance check meeting takes place to evaluate progress and if necessary, adapt the performance strategy. In the performance appraisal meeting at the end of the year, the final evaluation takes place. Consequences of these performance appraisals are salary raises, bonus allocations, and career developments.

3.4.2. Compensation. The compensation contract of sales employees contains a fixed salary, but does not contain an individual performance-based component. However, at the end of the year, they are assigned a discretionary bonus out of a company-wide bonus pool. The size of the bonus pool that each manager gets to allocate among his employees is formula-based and depends on the absolute performance of the company (determining the size of the pool) and the relative performance of the respective group (determining the group's share of the annual bonus pool).[8] While the bonus allocation between groups is formula-based, the allocation to employees within groups is left to the discretion of supervisors, although performance plays an important role in this allocation.

3.5. Sample, data and measures

We analyze promotion decisions by group managers at the group level and restrict our analysis to promotions of non-management employees, as promotions of managers and supervisors follow inherently different procedures and their inclusion would compromise the comparability of Type

[8] The sum of the individual targets within one group forms the overall performance target of the group for which the manager is responsible.

S and Type D promotions.[9] We further restrict our sample to the customer categories and job types explained above, for which detailed information on desired career paths, training, compensation, performance evaluation, and task environments are available. Employees in administration and support services are thus excluded from the sample, as a clear development plan for these positions is missing.

The data for our study are retrieved from BANK's personnel management and performance measurement system. The personnel data cover the period from January 1st 1998 to January 1st 2010, while data on individual performance evaluations are only available as of 2004. In 2010, BANK underwent significant organizational restructuring, resulting in a change in responsibility structures and the performance measurement system. In line with Gibbs (1995), we restrict our analysis to a period of stability in terms of structure and evaluation procedure, i.e., from 2004-2009.

The personnel data include personal information (e.g., age, gender, marital status, and firm tenure), compensation data (e.g., salary and bonus pool payments), as well as information on employees' career developments (e.g., job changes and exits) and training (including name, date and length of the training). The performance measurement system reports employees' individual performance compared to targets on a set of sales performance measures (on average 10 per year) on an annual basis. This allows us to link employees' career development and training history with data on individual performance and compensation. The full sample consists of 5,668 employee-years referring to 1,555 unique employees.

3.5.1. Training. We measure training as the number of training days per year. As discussed, we distinguish three different types of training, which we label *PRODTRAIN* for

[9] We do consider promotions ***to*** supervisors (branch managers); these employees are eliminated from the sample once they are in their new role.

product training, *LEADERTRAIN* for personnel-oriented leadership training; and *MGMTRAIN* for process-oriented management training. In different specifications, we either use the year-specific variable just described, or the training accumulated over two years, which we label *SUMPRODTRAIN*, *SUMLEADERTRAIN*, and *SUMMGMTRAIN*, respectively.

3.5.2. Promotions and promotion-based incentives. We define promotions as job changes representing advancements according to the company's internal job rating system. We label *PROMOTION* as 1 in the year of the actual promotion. We adjust for late promotions throughout the year. That is, promotions in the fourth quarter of the year are recognized in the following year, as it can be assumed that performance assessments throughout the current year serve as the basis for the promotion decision. Over our sample period we observe 514 promotions in total; 328 in the Type S group and 186 in the Type D group (59 cross promotions, 43 senior promotions, 35 supervisor promotions, and 49 expert promotions). Panel C of Table 1 provides an overview of the observed promotion patterns.

We measure promotion-based incentives as follows. For each hierarchical level within a branch, we assess whether there was a promotion opportunity in the respective branch. We label *INCENTIVES* as 1 for all employees in a specific job position and customer category within a branch if at least one peer in the same job position within the same customer category was promoted to a new job in that branch during our sample period, and 0 otherwise. The measure's level of aggregation is thus the hierarchical level within a branch and indicates whether there was a promotion slot open in a branch that everyone at a specific hierarchical level could have competed for. In addition, we use two alternative measures to capture incentives. First, instead of using an indicator variable for capturing the absence or presence of incentives, we measure the intensity of incentives. In particular, we measure *INC_INTENSITY* based on the number of

promotions in a specific job type - customer category combination within a branch during our sample period.

Both *INCENTIVES* and *INC_INTENSITY* are fixed over the whole sample period, and therefore do not take the distribution of incentives over the years into account. As a result, we also use a two-year forward-looking incentive measure. *INC_FORWARD* is an indicator variable that equals 1 for all employees in a specific job type - customer category combination within a branch if at least one peer at the same job type - customer category combination was promoted to a new job in that branch within the next two years, and 0 otherwise. In the empirical analysis, we further distinguish between Type S promotion–based incentives and Type D promotion–based incentives.

3.5.3. Performance. *PERFORMANCE* represents an explicit formula-based measure capturing annual sales performance compared to target on the pre-determined set of performance measures. In particular *PERFORMANCE* is measured as the average target achievement of all performance measures in a particular year.

3.5.4. Annual bonus. We use *%BONUS,* i.e., the bonus as a percentage of salary to capture the annual bonus.

3.6. Descriptive statistics

In Table 2 we provide detailed descriptive statistics for our training variables. Given that we expect systematic differences in training investments between employees competing for a Type S vs. Type D promotion, we report the descriptive statistics separately for each promotion group. The observed pattern in training frequencies provides first insights that are consistent with our theory. First, product training is by far conducted most often, both in terms of the percentage of employees conducting at least one day of training, as well as average training length. This is in

line with the expectation that product training is relevant for current productivity and thus provides immediate pay-offs. Second, consistent with expectations, product training is conducted more frequently in the Type S than the Type D group, both in terms of participation rate and average training length. The opposite holds for leadership and management training, which are conducted by more employees/longer in the Type D group. Table 3 provides descriptive statistics on the variables used in our analyses for the whole sample. Table 4 reports the Pearson correlations between the independent variables used in our analyses. None of the correlations cause multicollinearity concerns.

---------- Insert Table 2----------

---------- Insert Table 3 ----------

---------- Insert Table 4----------

4. Data analysis and results

Our main objective is to investigate whether promotion opportunities create implicit incentives for human capital acquisition, i.e., to estimate the causal effect of promotion opportunities on human capital acquisition. In order to provide robust evidence for this hypothesis, we conduct several empirical tests.

4.1. Promotion-based incentives for human capital acquisition

4.1.1. Main analysis. We develop an identification strategy to explicitly test our hypothesis that promotions provide incentives for the acquisition of human capital relevant to the next job. In particular, we argue that the opportunity to receive a promotion provides incentives to invest in the acquisition of human capital in order to increase the probability of a promotion. That is, we argue that training is an employee's incentive-driven choice. This reasoning implies

that, *ceteris paribus*, employees with promotion opportunities will invest more in promotion-relevant training than employees without promotion opportunities.

To test this prediction, we develop an identification strategy to estimate the causal effect of promotion opportunities on human capital acquisition. To identify the causal effect, we use an instrumental variables (IV) approach, where our choice of instruments is informed by the fact that promotion opportunities vary across branches, and that employees switch branches without switching jobs. In particular, we observe employees switching from a branch without promotion opportunities to a branch with opportunities, and vice versa, and we use these switches to instrument the promotion opportunities. In the Type S promotion group, these switches cover 37% of all switches that involve employees switching branches without switching jobs, where 18% relates to an increase in incentives and 19% to a decrease. In the Type D promotion group, these switches cover 50% of all switches that involve employees switching branches without switching jobs, where 27% relates to an increase in incentives and 23% to a decrease.

Consistent with this rather random pattern in switches, interviews with the Head of Human Resources reveal that employee switches are mainly the result of employees having moved to another (part of a) city (if triggered by the employee), or the result of unexpected, and thus ad-hoc changes in the personnel demand within a particular branch (if triggered by the firm). Although this suggests that the instruments are independent of the potential outcomes and potential treatment assignments, i.e., as good as randomly assigned, a more realistic assumption is that the instruments are conditionally independent, i.e., independent conditional on the covariates. An important covariate, over and above the employee- and group specific control variables used in the previous models, is the lag of the dependent variable, i.e., the lag of the

respective type of training.[10] Controlling for past training rules out that our results are driven by employees self-selecting into new branches based on their past training behavior. A further benefit of using the lagged dependent variable is that it controls for time-varying employee effects. If the true underlying model is one of employee fixed effects, then our estimate of the positive treatment effect will be conservative (Angrist and Pischke, 2009), which rules out that our results are driven by innate employee characteristics. Finally, we argue that the exclusion restriction holds because it is unlikely that there is another causal chain that links our instruments to training other than the causal chain through promotion-based incentives.

We use an efficient two-step Generalized Method of Moments (IV-GMM) estimator to estimate the causal effect of promotion opportunities on training. The first stage regression is:

$$INCENTIVES_{it} = \pi_0 + \pi_1 \Delta BRANCH_{it}^{ON} + \pi_2 \Delta BRANCH_{it}^{OFF} + X_{it}' \pi_3 + \epsilon_{it} \quad \text{(M1)}$$

where $INCENTIVES_{it}$ equals 1 in the presence of promotion opportunities, 0 otherwise; $\Delta BRANCH_{it}^{ON}$ ($\Delta BRANCH_{it}^{OFF}$) is an indicator variable that is set to 1 when employees switch from a branch without (with) promotion opportunities to a branch with (without) opportunities, without switching jobs, for those years that they work in the same job in the new branch, 0 otherwise; and X_{it} is a vector capturing the second stage covariates. The specification of the first stage indicates that a change in the instrument always changes the treatment status. This special case implies that our second stage estimates reflect the average causal effect (see Angrist and Pischke, 2009).

The second stage regression is:

$$TRAINING_{it} = \beta_0 + \beta_1 INCENTIVES_{it} + X_{it}' \beta_2 \quad \text{(M2)}$$

[10] Results are robust to also including the lag of sales performance.

The second stage covariates X_{it} are $TRAINING_{t-1}$, $YrAny\Delta BRANCH$, which equals 1 for the year in which an employee switches branches without switching jobs, irrespective of the existing promotion opportunities in the old/new branch, *SIZE*, *JOBTENURE*, *AVR.JOBLENGTH*, *GENDER*, *FULL*, and year fixed effects. In addition we use hierarchical level fixed effects because our incentive measure is aggregated at the hierarchical level within a branch and we want to control for systematic training differences between hierarchical levels. The standard errors are robust and furthermore clustered within groups, across years.

To empirically corroborate the relevance and exogeneity of the instruments, we perform the following tests. Regarding relevance, the partial R-square of the instruments for the Type S and Type D promotion opportunities equals on average 11.2% and 5.3%, respectively. For all instruments, the F-statistic of the first-stage is significant at the 1% level and the Kleibergen-Paap F statistic, which is cluster-robust, rejects the null hypothesis of weak instruments based on the critical values proposed by Stock & Yogo (2005). Regarding exogeneity, we use the cluster-robust Hansen J-statistic to test the overidentifying restrictions. The Hansen J-statistic fails to reject the null hypothesis of valid instruments, i.e., it fails to reject the assumption that the instruments are uncorrelated with the error term, with p-values for the Type S (Type D) promotion opportunities ranging from 0.18-0.42 (0.58-0.85). As a result, all standard tests verify that the instruments are exogenous and do not exhibit a weak-instrument problem (are relevant).

Table 5 reports the results for the causal model of interest (M2), where Panel A reports the results for the Type S promotion group, and Panel B those for the Type D promotion group. As discussed before, we define *INCENTIVES* as an indicator variable that equals one for all employees in a specific job type - customer category combination within a branch if at least one peer at the same job type - customer category combination was promoted to a new job in that branch during our sample period, and 0 otherwise. Consistent with expectations, we find that

employees invest more in *PRODTRAIN* in the presence of an opportunity for a promotion to a similar task environment (Type S promotion) than in the absence of such an opportunity ($p = 0.061$, two-tailed). The average causal effect of 1.187 implies that having an opportunity for a promotion to a similar task environment increases the number of product training days per year by approximately 1.2 days. This effect is economically significant, given the sample mean of 3.6 product training days per year. As expected, this result is not observed for *LEADERTRAIN* and *MGMTTRAIN*, i.e., an opportunity for a promotion to a similar task environment does not cause an increase in leadership or management training.

In contrast, employees who are presented with an opportunity to get promoted to a different task environment (Type D promotion) do not invest more in *PRODTRAIN* than when not presented with such an opportunity. While our theory predicts that the impact of promotion opportunities on product training should be smaller in the Type D group compared to the Type S group (see equations (12a) vs. (13a)), it does not necessarily predict an absence of an effect. The most likely explanation for this absence of an effect is that a Type D promotion opportunity favors investments in training that is particularly relevant in the next job. Consistent with this explanation, we find that employees who are presented with an opportunity to get promoted to a different task environment (Type D promotion) do invest more in *LEADERTRAIN* ($p = 0.019$, two-tailed) and *MGMTTRAIN* ($p = 0.059$, two-tailed) than when not presented with such an opportunity. The average causal effect of 0.301 (0.198) for leadership (management) training implies that having an opportunity for a promotion to a different task environment increases the number of leadership (management) training days per year by approximately 0.3 (0.2) days. While this effect may seem small, it is highly economically significant, given the sample mean of 0.2 (0.1) leadership (management) training days per year.

In sum, our empirical results provide support for the hypothesis that promotions provide incentives to increase investments in training relevant in the next job.

---------- Insert Table 5----------

4.1.2 Robustness tests. We use two alternative specifications for promotion-based incentives. First, we use a measure of incentive intensity, reflecting the intensity of the treatment rather than the presence. In particular, we measure *INC_INTENSITY* as the number of promotions in a specific job type - customer category combination within a branch during our sample period. As reported in Table 8, the results are robust to this alternative specification of incentives. We find that the intensity of treatment related to a promotion to a similar task environment increases *PRODTRAIN* ($p = 0.079$, two-tailed) but not *LEADERTRAIN* and *MGMTTRAIN*. The coefficient on *INC_INTENSITY* of 0.467 related to *PRODTRAIN* implies that every additional Type S promotion opportunity increases the number of product training days per year by approximately 0.5 days on average. With respect to a promotion to a different task environment, we find that the intensity of treatment increases *LEADERTRAIN* ($p = 0.024$, two-tailed) and *MGMTTRAIN* ($p = 0.074$), but not *PRODTRAIN*. Every additional Type D promotion opportunity increases the number of leadership (management) training days per year by approximately 0.2 (0.1) days on average.

---------- Insert Table 6----------

Further, we use a forward-looking specification of the absence or presence of incentives to account for the distribution of incentives over time. We measure *INC_FORWARD* as an indicator variable that equals 1 for all employees in a specific job type - customer category combination within a branch if at least one peer at the same job type - customer category combination was promoted to a new job in that branch within the following two years. In this

case, we furthermore adjust our instruments. The relevant switch is measured by comparing the two-year forward looking incentives of the new branch in the year of the switch to the two-year forward looking incentives of the old branch in the year prior to the switch. The results, reported in Table 9, show that, while the magnitude of the treatment effect for *PRODTRAIN* in the Type S group is higher when using *INC_FORWARD* than when using *INCENTIVES*, its significance reduces to being one-tailed significant ($p = 0.079$, one-tailed). For the Type D group, however, both the magnitude (economic significance) as well as the statistical significance of the treatment effect for *LEADERTRAIN* ($p < 0.01$, two-tailed) and *MGMTTRAIN* ($p = 0.043$, two-tailed) increases when using *INC_FORWARD*. More specifically, the average causal effect of 0.823 (0.338) for leadership (management) training implies that having an opportunity for a promotion to a different task environment during the upcoming two years increases the number of leadership (management) training days per year by approximately 0.8 (0.3) days.

---------- Insert Table 7----------

Finally, while *PRODTRAIN* can be more or less characterized as a continuous variable, the variables *LEADERTRAIN* and *MGMTTRAIN* contain a relatively small number of non-zero observations and are potentially better characterized as binary (see also Table 2). To examine the impact of this binary nature, we test our hypothesis after replacing the two continuous variables by two indicator variables that equal 1 when an employee had, respectively, leadership training and management training during the year, zero otherwise. The results of this analysis (untabulated) indicate that, in the Type S group, *INCENTIVES*, *INC_INTENSITY*, and *INC_FORWARD* do not make leadership and management training more likely. In contrast, in the Type D group, *INCENTIVES*, *INC_INTENSITY*, and *INC_FORWARD* all make leadership and management training more likely. All these results are in line with those reported in Tables 5-7.

4.2. Additional analyses: Training investments as predictor of promotion decisions

Our theoretical framework predicts that the incentives for human capital acquisition also change with δ, given $\delta > 0$. In other words, we expect that a small change in the task environment between jobs still triggers investments in product training, but a large change (for example a promotion to a supervisor) does not, and only triggers investments in leadership and management training. In our core analysis, we cannot differentiate between different types of Type D promotion opportunities, given that it is empirically difficult to isolate a change in promotion opportunity per class. However, if the incentives indeed are different for different δ, then we should observe that different types of skill sets (training) are associated with different types of promotion decisions. In particular, we expect that product training (leadership/management training) becomes less (more) of a predictor of the promotion decision as we move from a Type S promotion to a Type D-supervisor promotion.[15]

To test this prediction, we analyze in how far different types of training are predictors of different types of promotion decisions. We estimate the impact of the three types of training on the promotion probabilities of the four promotion types (Types S, and Type D: cross promotion, senior promotion, and supervisor promotion). To simultaneously consider the effect of alternative promotions, we estimate a multinomial logit regression using all four promotion types.[16] For this analysis, we use the full sample for which $PROMOTION_{t+1}$ is available, but eliminate the expert promotion observations.[17] We estimate the following multinomial regression model:

[15] In terms of our theoretical framework, we essentially test Equation (8).
[16] Inferences do not change when running four separate probit models.
[17] When including expert promotions as a separate promotion type, the sign and significance of *PERFORMANCE*, and the training categories *SUMPRODTRAIN*, *SUMLEADERTRAIN* and *SUMMGMTTRAIN* do not change for the alternative promotions, while only *SUMLEADERTRAIN* is significant for the expert promotions.

$$
\begin{aligned}
p(\text{PROMOTION TYPE})_{ijt+1} = {} & \beta_0 + \beta_1 \text{PERFORMANCE}_{ijt} + \beta_2 \text{SUMPRODTRAIN}_{ijt} \\
& + \beta_3 \text{SUMLEADERTRAIN}_{ijt} + \beta_4 \text{SUMMGMTRAIN}_{ijt} + \beta_5 \text{SIZE}_{jt} \\
& + \beta_6 \text{HIERLEVEL}_{ijt} + \beta_7 \text{JOBTENURE}_{ijt} + \beta_8 \text{AVR.JOBLENGTH}_{ijt} \\
& + \beta_9 \text{GENDER}_{ijt} + \beta_{10} \text{FULL}_{ijt} + \nu_t + \varepsilon_{ijt}
\end{aligned} \qquad \text{(M3)}
$$

where *i* relates to the employee, *j* to the group, and *t* to the year.

We expect that managers take current job performance into account when making promotion decisions, especially for promotions to jobs with similar task environments. The only exception is the supervisor promotion because current sales performance is less likely to reflect the potential to be a good branch manager. We further control for employee- and group-specific characteristics that might systematically affect the promotion probabilities. We include *SIZE*, measured as the number of employees in the group, but we do not make predictions on the relationship between group size and the likelihood of promotion. We also incorporate an employee's current hierarchical level to control for differences in promotion probabilities across the hierarchy (*HIERLEVEL*). Consistent with prior literature (e.g., Ederhof (2011), Gibbs (1995)), we expect a decrease in promotion probabilities with increasing hierarchical levels. As we use the company's internal job rating system, assigning lower numbers to higher levels, we expect a positive relationship between promotion probabilities and hierarchical level. We further control for tenure in the current job (*JOBTENURE*). Since effective ability is assumed to increase with job tenure so should the probability of promotion, which suggests a positive relationship. Alternatively, it can be argued that job tenure is negatively related to promotion probabilities, as employees passed over for promotion in the past have a lower probability of getting promoted in the future. We have no expectation regarding which effect will dominate and therefore make no directional prediction. We incorporate an employee's average job length, measured as the employee's firm tenure before starting the current job divided by the number of jobs that the

employee has previously occupied within the firm (*AVRJOBLENGTH*), and expect a negative relation, as people who move up fast in the hierarchy are more likely to be high potentials and thus more likely to be again promoted. We further control for gender with an indicator variable, assuming the value of 1 for male employees, having no directional prediction (*GENDER*). We also control for whether the employee has a full-time job or not, with full-time equaling 1 (*FULL*). We further control for job type (junior vs. professional vs. senior) fixed effects, since the likelihood of, for example, Type S and Type D promotions are not the same for all job types. Finally, in estimating the equation we use year fixed effects and standard errors clustered within groups, across years.

---------- Insert Table 8----------

We report the results in Table 8. We find that *PERFORMANCE* is a significant predictor of all promotion types but supervisor promotions. These results suggest that, with the exception of supervisor promotions, promotion opportunities provide incentives to increase current job performance. Regarding the effect of training, we find results that are consistent with our predictions. Product training is a significant predictor of Type S and cross promotions, which both are characterized by (some) overlap between the tasks in the current and the next job. Further, product training does not increase the probabilities of senior or supervisor promotions, which involve a great(er) change in task environments. In line with expectations, leadership training does not affect Type S and cross promotions, but significantly increases the probabilities of being promoted to senior or supervisor. Lastly, only supervisor promotions become more likely with management training, which is consistent with the position of branch manager being the first true management position in the hierarchy where process-oriented management skills are needed. Overall, the results provide evidence that the acquisition of different types of human

capital relate to different types of promotions, which is consistent with different types of promotions triggering different types of human capital acquisition.

4.3. Additional analysis: Bonus consequences of training investments

Our core analysis shows that Type S and Type D promotion opportunities seem to have a small to no effect on product training (Tables 5-7), even though product training is a strong predictor of Type S and Type D-cross promotions (Table 8). These findings suggest that there are reasons other than promotions for why employees engage in product training. Our theoretical framework predicts that performance-based rewards (annual bonuses) provide incentives for training relevant in the current job, i.e., product training, but not in training only relevant in the next job (leadership and management training). The actual underlying assumption is that only product training increases productivity in the current job, which in turn has an effect on the bonus. To test these predictions, we examine the performance consequences of training investments, as well as the bonus consequences of performance (and training investments). For both models, we eliminate employee-year observations when employees got promoted to ensure that the accumulated human capital is acquired in the current job.[18] We further eliminate employees at senior positions for who sales performance is not the only relevant performance dimension.[19] First, we run the following regression model for the full sample as well as the Type S and Type D samples separately.

$$\begin{aligned} PERFORMANCE_{ijt} &= \beta_1 SUMPRODTRAIN_{ijt} + \beta_2 SUMLEADERTRAIN_{ijt} + \beta_3 SUMMGMTRAIN_{ijt} \\ &+ \beta_4 SIZE_{jt} + \beta_5 HIERLEVEL_{ijt} + \beta_6 JOBTENURE_{ijt} + \beta_7 AVR.JOBLENGTH_{ijt} \\ &+ \beta_8 FULL_{ijt} + \mu_i + \nu_t + \varepsilon_{ijt} \end{aligned} \quad \text{(M4)}$$

[18] The results are robust to excluding all observations with job tenure of less than a year.

[19] The reason for this is that for seniors, bonus payments are not only based on sales performance, but also the quality of their mentoring activities (see Grabner and Moers (2013b)). However, given the small number of senior employees, results remain unchanged when seniors are included in the analysis.

where *i* relates to the employee, *j* to the group, and *t* to the year. In addition to controlling for employee-fixed effects, we control for time-variant employee- and group-specific characteristics that might systematically affect employee performance. We include *SIZE*, measured as the number of employees in the group. We also incorporate an employee's current hierarchical level to control for differences in performance levels across the hierarchy (*HIERLEVEL*). We control for tenure in the current job (*JOBTENURE*), which we expect to be positively related to performance due to increases in effective ability over time (Gibbons and Waldman (1999)). We incorporate an employee's average job length, measured as the employee's firm tenure before starting the current job divided by the number of jobs that the employee has previously occupied within the firm (*AVRJOBLENGTH*), and expect a negative relation, as people who move up fast in the hierarchy are more likely to be high potentials and thus perform better.[20] We also control for whether the employee has a full-time job or not using an indicator variable, with full-time equaling 1 (*FULL*). Finally, in estimating the equation we also use year and job type (junior vs. professional vs. senior) fixed effects, and standard errors clustered at the employee level.

We report the results in Table 9, Panel A, where Column I relates to the full sample, Column II relates to the Type S sample, and Column III relates to the Type D sample. In line with expectations, we find that *SUMPRODTRAIN* is positively and significantly related to sales performance, while *SUMLEADERTRAIN* and *SUMMGMTRAIN* are not related to sales performance.

---------- Insert Table 9----------

Second, we confirm that employees have performance-based bonus incentives by showing that individual performance is driving annual bonuses. In particular, we run the following fixed-

[20] When an employee is in his/her first job, we set the AVRJOBLENGTH equal to JOBTENURE. Our inferences are not affected by this imputation.

effects regression models for the full sample as well as the Type S and Type D samples separately.

$$\begin{aligned}\%\text{BONUS}_{ijt} &= \beta_1 \text{PERFORMANCE}_{ijt} + \beta_2 \text{SUMPRODTRAIN}_{ijt} + \beta_3 \text{SUMLEADERTRAIN}_{ijt} \\ &+ \beta_4 \text{SUMMGMTRAIN}_{ijt} + \beta_5 \text{SIZE}_{jt} + \beta_6 \text{HIERLEVEL}_{ijt} + \beta_7 \text{JOBTENURE}_{ijt} \\ &+ \beta_8 \text{AVR.JOBLENGTH}_{ijt} + \beta_9 \text{FULL}_{ijt} + \mu_i + \nu_t + \varepsilon_{ijt}\end{aligned} \quad \text{(M5)}$$

Besides current sales performance, we also include the different types of accumulated human capital to examine whether investments in training that does not affect current performance are compensated for with the annual bonus. We control for the same employee- and group-specific characteristics also used in the performance equation. In estimating the equation we use employee, year, and job-type fixed effects, and standard errors clustered at the employee level. We report the results in Table 9, Panel B, where Column I relates to the full sample, Column II relates to the Type S sample, and Column III relates to the Type D sample. Consistent with expectations, we show that sales performance is a strong driver of the annual bonus. Further, leadership and management training do not have bonus consequences. Interestingly, product training increases the annual bonus over and above its effect on sales performance, which suggests that employees who train, get compensated for the lost time on selling activities.[21] From a bonus-based incentive perspective, these results imply that employees, regardless of promotion opportunities, have strong incentives to invest in product training to increase their annual bonus, while there are no bonus-based incentives to invest in leadership and management training. These findings corroborate our main hypothesis that promotions are the most effective mechanisms to incentivize investments in skills that are relevant for the tasks in the next job.

[21] Given that sales performance is itself affected by product training, sales performance can be considered a bad control in estimating the effect of product training on annual bonuses (Angrist and Pischke (2009]). We therefore estimate an alternative model excluding sales performance. The results for the different types of training remain robust.

5. Conclusion

Although the importance of human capital in building and maintaining competitive advantage is undisputed, management control research has not dedicated much attention to the personnel control mechanisms that aim at upgrading the effective ability of employees, i.e., training and assignment of employees (i.e., promotions). In this paper we investigate the complementary roles of these two personnel control mechanisms in the active management of employees' human capital acquisition. In particular, we highlight the role of promotions in incentivizing employees to invest in task-specific human capital. We show not only that different training types are predictors of different promotions, but also that employees with promotion opportunities invest significantly more in those training programs that increase their chance of promotion than employees without promotion opportunities.

These findings have important managerial implications. First, promotions do not only provide effort incentives as shown by prior literature, but also incentives to invest in the development of productivity-enhancing skills. Given that productivity is a function of effort and skills, promotion plans and corresponding training opportunities can be helpful in managing both inputs to employee productivity.

Moreover, due to their unstable nature, promotions have been criticized to be less useful for incentivizing decisions that are sensitive to temporary drops in incentives, like effort (Gibbs, 1995). On the other hand, annual bonuses are a poor mechanism to incentivize human capital acquisition. While effort affects current performance and can therefore be incentivized by annual bonuses, these bonuses only incentivize human capital investments to the extent that they are relevant in the current job, but not in the next job. Interestingly, the non-stationary property of promotions is less problematic for incentivizing human capital investments because the cost to the employee of reducing these investments is high. Human capital is a capital stock that

represents the accumulation of past and current investments. All else equal, an employee's current investment in human capital increases his capital stock and therefore his future productivity. More importantly, not making an investment decreases his human capital because, as with most capital stock, human capital is also subject to depreciation. Hence, the adverse consequences of short-term reductions in human capital investments can be severe, which makes these incentives more persistent. Promotions are therefore an ideal mechanism to incentivize the acquisition of human capital, irrespective of whether these skills are directly relevant in the current job.

Another implication concerns the sorting vs. incentive role of promotions. Prior literature has emphasized that, in Type D settings, the incentive and sorting role of promotions is likely to conflict. Consistent with Prendergast (1993), our findings imply that it is important to consider the type of incentive provided. In contrast to rewarding effort, rewarding the acquisition of human capital with a promotion is not in conflict with the sorting role of promotions, but rather complementary to it.

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Appendix

Variable Descriptions

Variable	***Description***
PRODTRAIN (SUMPRODTRAIN)	number of product training days per year (accumulated over two years)
LEADERTRAIN (SUMLEADERTRAIN)	number of leadership training days per year (accumulated over two years)
MGMTRAIN (SUMMGMTRAIN)	number of management training days per year (accumulated over two years)
%BONUS	bonus as a percentage of salary
PERFORMANCE	the average target achievement of all performance measures in a particular year
SALARY	is the annualized monthly base salary in Euros.
PROMOTION	indicator variable that equals 1 for job changes representing advancements according to the company's internal job rating system, and 0 otherwise
TYPE S PROMOTION	refers to a promotion from a junior position to a professional position within the same customer category.
CROSS PROMOTION	refers to a promotion from a junior or professional position in one customer category to a junior or professional position in a higher-level customer category.
SENIOR PROMOTION	refers to a promotion to a senior position within the same customer category.
SUPERVISOR PROMOTION	refers to a promotion to a supervisor position.
TYPE D PROMOTION	Is an aggregate measure of cross, senior and supervisor promotions
INCENTIVES	is an indicator variable that equals 1 for all employees in a specific job type - customer category combination within a branch if at least one peer at the same job type - customer category combination was promoted to a new job in that branch during our sample period, and 0 otherwise.
INC_INTENSITY	is an intensity of incentives measure based on the number of promotions in a specific job type - customer category combination within a branch during our sample period
INC_FORWARD	is an indicator variable that equals 1 for all employees in a specific job type - customer category combination within a branch if at least one peer at the same job type - customer category combination was promoted to a new job in that

	branch within the following two years
*YrAny*Δ*BRANCH*	is an indicator variable that equals 1 for the year in which an employee switches branches without switching jobs, irrespective of the existing promotion opportunities in the old/new branch, 0 otherwise.
$\Delta BRANCH_{it}^{ON}$	is an indicator variable that is set to 1 when employees switch from a branch without promotion opportunities to a branch with opportunities, without switching jobs, for those years that they work in the same job in the new branch, 0 otherwise
$\Delta BRANCH_{it}^{OFF}$	is an indicator variable that is set to 1 when employees switch from a branch with promotion opportunities to a branch without opportunities, without switching jobs, for those years that they work in the same job in the new branch, 0 otherwise
$\Delta BRANCH_{it}^{ON2YR}$	is an indicator variable that is set to 1 when employees switch from a branch without promotion opportunities in a two-year window to a branch with opportunities in a two-year window, without switching jobs, for those years that they work in the same job under incentives in the new branch, 0 otherwise
$\Delta BRANCH_{it}^{OFF2YR}$	is an indicator variable that is set to 1 when employees switch from a branch with promotion opportunities in a two-year window to a branch without opportunities in a two-year window, without switching jobs, for those years that they work in the same job under no incentives in the new branch, 0 otherwise
AVR.JOBLENGTH	is the employee's firm tenure before starting the current job divided by the number of jobs that the employee has previously occupied within the firm (if the employee is in his/her first job, we set this measure equal to job tenure).
JOBTENURE	is the employee's tenure in the current job in years.
HIERLEVEL	is the employee's rank in the corporate hierarchy based on the company's internal job rating system, where a lower number represents a higher rank.
SIZE	is the number of employees within a group that share in the same bonus pool.
GENDER	is an indicator variable that equals 1 (0) if the employee is a male (female).

FULL	is an indicator variable that equals 1 if the employee is employed full-time, zero otherwise.

Table 1

The Hierarchy at BANK

Panel A: Description of Hierarchy Variables

Customer category	Description	Classification of customer groups being served by an employee based on a *hierarchical* customer segmentation model
	Values	Standard customers - Wealthy customers - Commercial customers
Job type	Description	Hierarchy of jobs within each customer category
	Values	Junior - Professional - Senior
Hierarchical level	Description	Internal job rating system reflecting an employee's level in the hierarchy within BANK; for sales employees within a branch, this level is determined by the combination of job type and customer category
	Values	Ratings range from 18 to 10 with higher numbers being assigned to lower levels

Panel B: Internal job rating system

Standard customers		**Wealthy customers**		**Commercial customers**		**Outside**	
Job type	*Job rating*	*Job type*	*Job rating*	*Job type*	*Job rating*	*Job position*	*Job rating*
JUNIOR	18	JUNIOR	16	JUNIOR	14	EXPERT	16 - 12
PROFESSIONAL	17	PROFESSIONAL	15	PROFESSIONAL	13	BRANCH MANAGER	11 - 10
SENIOR	15	SENIOR	13	SENIOR	12		

Panel C: Frequency of observed promotion patterns

	Same customer category		**Higher customer category**			**Outside**	
from/ to	PROFESSIONAL (S Promotion)	SENIOR (D Promotion)	JUNIOR (D Promotion)	PROFESSIONAL (D Promotion)	SENIOR (D Promotion)	BRANCH MANAGER (D Promotion)	EXPERT (D Promotion)
JUNIOR	328	5	43			5	29
PROFESSIONAL		38	9	7		18	18
SENIOR						12	2
	328	**43**	**59**			**35**	**49**

Source: Grabner and Moers (2013b)

Table 2
Descriptive statistics for training

Variable	Promotion Group	%	n	Mean	Std	Median	Min	Max
PRODTRAIN	Type S (952)	87%	827	11.6	7.5	10.0	1	49
	Type D (1044)	77%	804	7.8	6.0	6.0	1	35
LEADERTRAIN	Type S (952)	8%	80	3.2	1.7	3	1	11
	Type D (1044)	14%	150	4.7	3.9	3	1	23
MGMTRAIN	Type S (952)	8%	73	3.0	0.5	3	2	4
	Type D (1044)	10%	108	3.1	0.8	3	1	6

Data are for the time period 2004-2009 and the sample sizes relate to employee observations. This table reports descriptive statistics for the average accumulation of training days over the whole sample period for the three training types, respectively. *Column %* reports the percentage of employees that received at least one day of training in the respective training type during our sample period. *Column n* reports the corresponding number of employees. Descriptive statistics are provided for the sample of employees that received at least one day of training, and refer to the accumulation of training days over the whole sample period.
See Appendix for variable descriptions

Table 3

Descriptive statistics

Variable	n	Mean	Standard Deviation	Q1	Median	Q3
Promotion rate [a]	4,705	0.11	0.31	0	0	0
Salary	5,668	36,933	13,510	27,029	33,366	44,976
Bonus as % of Salary	5,668	5.00	4.13	1.99	4.03	6.89
Sales performance	5,668	-0.38	47.95	-29.83	-6.13	23.46
Average job length	5,668	6.1	5.7	2.4	3.8	7.6
Job tenure	5,668	4.3	3.7	1.4	3.0	6.1
Size	5,668	24	8	17	22	30
Gender	5,668	0.39	0.49	0	0	1
Full	5,668	0.80	0.40	1	1	1

Data are for the time period 2004-2009 and the sample size relates to employee-years. See Appendix for variable descriptions

[a] To be consistent with Grabner and Moers (2013b), we only report descriptive statistics on promotion rate for the observations used in the promotion regression; that is, for which $PROMOTION_{t+1}$ is available

Table 4

Correlations between variables

	Variable	1	2	3	4	5	6	7	8	9
1	PRODTRAIN									
2	LEADERTRAIN	-0.03**								
3	MGMTRAIN	0.08***	0.17***							
4	SALARY	-0.32***	0.02	-0.01						
5	%BONUS	0.06***	0.07***	0.09***	-0.07***					
6	PERFORMANCE	0.10***	0.01	0.01	-0.06***	0.42***				
7	AVR.JOBLENGTH	-0.29***	-0.04***	-0.08***	0.46***	-0.12***	-0.04***			
8	JOBTENURE	-0.32***	-0.03**	-0.07***	0.30***	-0.10***	-0.03**	0.10***		
9	SIZE	-0.00	-0.01	0.02	-0.01	-0.10***	0.01	0.02	0.04***	
10	GENDER	-0.04***	0.02	0.05***	0.30***	0.06***	0.02	-0.01	-0.03**	0.03**

Data are for the time period 2004-2009 and the sample size is 5,668 employee-years. See Appendix for variable descriptions.
*, **, *** is significant at 10 percent, 5 percent, and 1 percent, respectively (two-tailed).

Table 5

IV-GMM estimation of promotion-based incentives for human capital acquisition

PANEL A: *Type S promotion group*

VARIABLES	$PRODTRAIN_t$	$LEADERTRAIN_t$	$MGMTRAIN_t$
INCENTIVES	1.187*	-0.088	-0.029
	(1.875)	(-1.083)	(-0.272)
*YrAny*Δ*BRANCH*	0.552	-0.071**	-0.084**
	(1.520)	(-2.088)	(-2.039)
$SIZE_t$	-0.008	0.004	0.000
	(-0.366)	(1.435)	(0.137)
$JOBTENURE_t$	-0.385***	-0.013***	-0.029***
	(-9.703)	(-3.090)	(-4.670)
$AVR.JOBLENGTH_t$	-0.090***	-0.007**	-0.008**
	(-3.985)	(-2.480)	(-2.384)
GENDER	-0.484*	-0.053	0.094**
	(-1.757)	(-1.090)	(2.352)
$FULL_t$	1.302***	-0.006	-0.045
	(4.357)	(-0.093)	(-1.151)
$PRODTRAIN_{t-1}$	0.033		
	(0.988)		
$LEADERTRAIN_{t-1}$		0.164	
		(1.472)	
$MGMTRAIN_{t-1}$			-0.182***
			(-7.178)
Constant	3.481***	0.091	0.253**
	(4.194)	(0.820)	(1.992)
Hierarchical level fixed effects	yes	yes	yes
Year fixed effects	yes	yes	yes
Observations	1,052	1,052	1,052
R-squared	0.206	0.025	0.147
F-test	22.90	3.852	4.917

PANEL B: *Type D Promotion Group*

VARIABLES	$PRODTRAIN_t$	$LEADERTRAIN_t$	$MGMTRAIN_t$
INCENTIVES	0.335	0.301**	0.198*
	(0.846)	(2.348)	(1.890)
YrAny∆BRANCH	0.353	-0.030	0.035
	(1.105)	(-0.325)	(0.514)
$SIZE_t$	-0.004	-0.005	0.001
	(-0.332)	(-1.513)	(0.589)
$JOBTENURE_t$	-0.086***	-0.003	-0.000
	(-5.202)	(-0.533)	(-0.000)
$AVR.JOBLENGTH_t$	-0.051***	-0.008**	-0.007***
	(-5.970)	(-2.107)	(-4.469)
GENDER	-0.191	-0.026	0.031
	(-1.428)	(-0.547)	(1.034)
$FULL_t$	0.608***	0.064	0.046*
	(2.966)	(1.388)	(1.686)
$PRODTRAIN_{t-1}$	0.184***		
	(5.892)		
$LEADERTRAIN_{t-1}$		0.132***	
		(3.352)	
$MGMTRAIN_{t-1}$			-0.053***
			(-4.760)
Constant	0.917**	0.221	-0.091
	(2.406)	(1.170)	(-1.009)
Hierarchical level fixed effects	yes	yes	yes
Year fixed effects	yes	yes	yes
Observations	2,155	2,155	2,155
R-squared	0.211	0.026	0.000
F-test	35.21	3.572	5.390

Data used in the IV estimation are for the time period 2004-2009 and the sample size relates to employee-years. The models are estimated using an efficient two-step GMM estimator, with $\Delta BRANCH_{it}^{ON}$ and $\Delta BRANCH_{it}^{ON}$ as instruments in the first stage. Z-statistics are in brackets and based on robust standard errors, adjusted for clustering within groups over time. See Appendix for variable descriptions.

*, **, *** is significant at 10 percent, 5 percent, and 1 percent, respectively (two-tailed).

Table 6

IV-GMM estimation of promotion-based incentives for human capital acquisition using the intensity of incentives

PANEL A: *Type S promotion group*

VARIABLES	$PRODTRAIN_t$	$LEADERTRAIN_t$	$MGMTRAIN_t$
INC_INTENSITY	0.467*	-0.045	-0.007
	(1.755)	(-1.422)	(-0.147)
YrAny∆BRANCH	0.577	-0.078**	-0.081*
	(1.521)	(-2.242)	(-1.735)
$SIZE_t$	-0.013	0.004	0.000
	(-0.612)	(1.484)	(0.147)
$JOBTENURE_t$	-0.387***	-0.014***	-0.029***
	(-9.335)	(-3.205)	(-4.619)
$AVR.JOBLENGTH_t$	-0.094***	-0.007***	-0.007**
	(-4.244)	(-2.577)	(-2.334)
GENDER	-0.441	-0.057	0.092**
	(-1.588)	(-1.172)	(2.302)
$FULL_t$	1.256***	0.000	-0.042
	(4.072)	(0.003)	(-1.118)
$PRODTRAIN_{t-1}$	0.023		
	(0.678)		
$LEADERTRAIN_{t-1}$		0.169	
		(1.553)	
$MGMTRAIN_{t-1}$			-0.182***
			(-7.202)
Constant	3.869***	0.078	0.243*
	(4.866)	(0.718)	(1.889)
Hierarchical level fixed effects	yes	yes	yes
Year fixed effects	yes	yes	yes
Observations	1,052	1,052	1,052
R-squared	0.216	0.021	0.147
F-test	20.25	3.907	4.905

PANEL B: *Type D Promotion Group*

VARIABLES	$PRODTRAIN_t$	$LEADERTRAIN_t$	$MGMTRAIN_t$
INC_ INTENSITY	0.261	0.210**	0.140*
	(0.882)	(2.259)	(1.787)
YrAny∆BRANCH	0.356	-0.023	0.042
	(1.121)	(-0.240)	(0.603)
$SIZE_t$	-0.006	-0.007**	-0.000
	(-0.551)	(-2.083)	(-0.162)
$JOBTENURE_t$	-0.086***	-0.003	-0.000
	(-5.200)	(-0.527)	(-0.042)
$AVR.JOBLENGTH_t$	-0.049***	-0.006*	-0.006***
	(-5.522)	(-1.702)	(-3.609)
GENDER	-0.176	-0.015	0.041
	(-1.313)	(-0.304)	(1.316)
$FULL_t$	0.615***	0.070	0.049
	(2.946)	(1.474)	(1.621)
$PRODTRAIN_{t-1}$	0.180***		
	(5.472)		
$LEADERTRAIN_{t-1}$		0.136***	
		(3.431)	
$MGMTRAIN_{t-1}$			-0.055***
			(-4.194)
Constant	0.932**	0.233	-0.082
	(2.500)	(1.223)	(-0.872)
Hierarchical level fixed effects	yes	yes	yes
Year fixed effects	yes	yes	yes
Observations	2,155	2,155	2,155
R-squared	0.213	0.016	-0.018
F-test	34.90	3.772	5.138

Data used in the IV estimation are for the time period 2004-2009 and the sample size relates to employee-years. The models are estimated using an efficient two-step GMM estimator, with $\Delta BRANCH_{it}^{ON}$ and $\Delta BRANCH_{it}^{ON}$ as instruments in the first stage. Z-statistics are in brackets and based on robust standard errors, adjusted for clustering within groups over time. See Appendix for variable descriptions.

*, **, *** is significant at 10 percent, 5 percent, and 1 percent, respectively (two-tailed).

Table 7

IV-GMM estimation of promotion-based incentives for human capital acquisition using a forward looking incentive measure

PANEL A: *Type S promotion group*

VARIABLES	$PRODTRAIN_t$	$LEADERTRAIN_t$	$MGMTRAIN_t$
INC_FORWARD	1.401	-0.136	0.087
	(1.416)	(-1.498)	(1.149)
*YrAny*Δ*BRANCH*	0.173	-0.044	-0.021
	(0.358)	(-1.030)	(-0.401)
$SIZE_t$	-0.016	0.006*	-0.001
	(-0.705)	(1.750)	(-0.610)
$JOBTENURE_t$	-0.400***	-0.014***	-0.028***
	(-9.273)	(-3.524)	(-4.933)
$AVR.JOBLENGTH_t$	-0.098***	-0.006*	-0.004
	(-4.009)	(-1.934)	(-1.154)
GENDER	-0.370	-0.010	0.093**
	(-1.190)	(-0.198)	(2.245)
$FULL_t$	1.175***	-0.031	-0.042
	(3.532)	(-0.456)	(-1.095)
$PRODTRAIN_{t-1}$	-0.002		
	(-0.071)		
$LEADERTRAIN_{t-1}$		0.135	
		(0.977)	
$MGMTRAIN_{t-1}$			-0.136***
			(-4.962)
Constant	4.349***	0.095	0.147
	(4.515)	(0.742)	(1.169)
Hierarchical level fixed effects	yes	yes	yes
Year fixed effects	yes	yes	yes
Observations	812	812	812
R-squared	0.176	0.020	0.113
F-test	18.19	1.953	5.053

PANEL B: *Type D Promotion Group*

VARIABLES	$PRODTRAIN_t$	$LEADERTRAIN_t$	$MGMTRAIN_t$
INC_FORWARD	-0.229	0.823***	0.338**
	(-0.439)	(2.670)	(2.021)
YrAny∆BRANCH	0.231	0.031	-0.014
	(0.752)	(0.300)	(-0.214)
$SIZE_t$	-0.007	-0.006	0.001
	(-0.579)	(-1.227)	(0.665)
$JOBTENURE_t$	-0.074***	-0.003	-0.002
	(-4.002)	(-0.386)	(-0.923)
$AVR.JOBLENGTH_t$	-0.048***	-0.010**	-0.006***
	(-5.448)	(-2.131)	(-3.858)
GENDER	-0.139	0.034	0.020
	(-0.880)	(0.511)	(0.741)
$FULL_t$	0.761***	0.029	0.050*
	(3.799)	(0.435)	(1.839)
$PRODTRAIN_{t-1}$	0.209***		
	(6.813)		
$LEADERTRAIN_{t-1}$		0.126**	
		(2.478)	
$MGMTRAIN_{t-1}$			-0.066***
			(-5.365)
Constant	0.992***	0.186	-0.114
	(2.595)	(0.733)	(-1.497)
Hierarchical level fixed effects	yes	yes	yes
Year fixed effects	yes	yes	yes
Observations	1,636	1,636	1,636
R-squared	0.210	-0.048	-0.056
F-test	23.98	3.528	3.889

Data used in the IV estimation are for the time period 2004-2008 and the sample size relates to employee-years. The models are estimated using an efficient two-step GMM estimator, with $\Delta BRANCH_{it}^{ON2YR}$ and $\Delta BRANCH_{it}^{OFF2YR}$ as instruments in the first stage. Z-statistics are in brackets and based on robust standard errors, adjusted for clustering within groups over time. See Appendix for variable descriptions.
*, **, *** is significant at 10 percent, 5 percent, and 1 percent, respectively (two-tailed).

Table 8

Multinomial Logit Analysis of the Relevance of Training in Promotion Decisions

Variable	*Type S promotions*	*Cross promotions*	*Senior promotions*	*Supervisor promotions*
$PERFORMANCE_t$	0.009***	0.008***	0.011***	-0.007
	(6.627)	(3.262)	(3.304)	(-1.093)
$SUMPRODTRAIN_t$	0.047***	0.081***	0.047	-0.019
	(4.215)	(3.808)	(1.307)	(-0.342)
$SUMLEADERTRAIN_t$	0.063	-0.266	0.187***	0.227***
	(0.871)	(-1.074)	(4.120)	(3.111)
$SUMMGMTRAIN_t$	-0.466***	0.087	0.169	0.615***
	(-4.190)	(0.484)	(0.858)	(3.162)
$SIZE_t$	0.010	0.012	0.022	0.003
	(1.292)	(0.729)	(0.910)	(0.149)
$HIERLEVEL_t$	-1.169***	0.337	-2.334***	-0.948***
	(-7.076)	(1.071)	(-4.411)	(-2.592)
$JOBTENURE_t$	-0.045	-0.247*	-0.059	-0.001
	(-1.573)	(-1.867)	(-1.049)	(-0.011)
$AVR.JOBLENGTH_t$	-0.006	-0.015	0.017	-0.124***
	(-0.386)	(-0.484)	(0.687)	(-2.635)
$FULL_t$	0.168	0.123	0.948	0.084
	(0.884)	(0.287)	(1.535)	(0.110)
GENDER	0.027	0.268	-0.260	0.665
	(0.235)	(0.875)	(-0.981)	(1.265)
Constant	-2,214	-10.977**	32.772***	10.278*
	(-0.797)	(-2.096)	(3.928)	(1.712)
Job-type fixed effects	yes			
Year fixed effects	yes			
Observations	4,656			
Pr > ChiSq	<0.001			

Data used in the multinomial logit estimation are for the time period 2004-2009 and the sample size relates to employee-years. Consistent with Grabner and Moers (2013b), we exclude expert promotions (minus 49 employee-year observations). Z-statistics are in brackets and based on robust standard errors, adjusted for clustering within groups over time. See Appendix for variable descriptions.

*, **, *** is significant at 10 percent, 5 percent, and 1 percent, respectively (two-tailed).

Table 9

Performance and bonus consequences of human capital acquisition

Panel A: *The Performance Effect of Training*

Variable	Full Sample	Type S	Type D
$SUMPRODTRAIN_t$	0.837***	1.039***	0.479**
	(4.695)	(4.336)	(2.116)
$SUMLEADERTRAIN_t$	-0.656	-1.077	-0.791
	(-1.130)	(-0.573)	(-1.342)
$SUMMGMTRAIN_t$	-1.641	0.785	0.764
	(-1.416)	(0.419)	(0.458)
$SIZE_t$	-0.003	-0.062	-0.094
	(-0.016)	(-0.180)	(-0.458)
$HIERLEVEL_t$	29.368***	30.864***	16.153
	(6.114)	(2.845)	(1.481)
$JOBTENURE_t$	3.009***	9.737***	0.586
	(7.446)	(7.865)	(1.262)
$AVR.JOBLENGTH_t$	1.945***	6.608***	1.375*
	(3.117)	(3.081)	(1.949)
$FULL_t$	-6.820	-2.353	-4.779
	(-1.143)	(-0.189)	(-0.678)
Constant	-532.006***	-614.939***	-288.345
	(-6.554)	(-3.133)	(-1.601)
Employee fixed effects	yes	yes	yes
Job-type fixed effects	yes	no	yes
Year fixed effects	yes	yes	yes
Observations	4,788	2,048	2,740
R-squared	0.209	0.302	0.170
Number of employees	1,457	926	882
Overall R^2	0.0260	0.00373	0.0350

PANEL B: *The Bonus Consequences of Performance and Training*

Variable	Full Sample	Type S	Type D
$PERFORMANCE_t$	0.022***	0.020***	0.027***
	(13.807)	(9.275)	(9.741)
$SUMPRODTRAIN_t$	0.062***	0.051***	0.088***
	(5.102)	(2.823)	(3.870)
$SUMLEADERTRAIN_t$	0.006	-0.047	0.017
	(0.111)	(-0.383)	(0.286)
$SUMMGMTRAIN_t$	0.048	-0.038	-0.113
	(0.511)	(-0.193)	(-0.827)
$SIZE_t$	-0.037***	-0.017	-0.041***
	(-3.311)	(-0.812)	(-2.883)
$HIERLEVEL_t$	-1.143***	-1.317**	-0.735
	(-2.987)	(-2.055)	(-0.644)
$JOBTENURE_t$	-0.190***	-0.221***	-0.220***
	(-5.935)	(-3.162)	(-4.901)
$AVR.JOBLENGTH_t$	-0.037	-0.066	0.010
	(-0.840)	(-0.496)	(0.150)
$FULL_t$	-0.033	-1.279	0.299
	(-0.094)	(-1.478)	(0.699)
Constant	25.366***	29.442***	18.534
	(3.953)	(2.601)	(0.981)
Employee fixed effects	yes	yes	yes
Job-type fixed effects	yes	no	yes
Year fixed effects	yes	yes	yes
Observations	4,788	2,048	2,740
R-squared	0.221	0.170	0.267
Number of employees	1,457	926	882
Overall R^2	0.281	0.268	0.262

Data used in the fixed-effects estimations are for the time period 2004-2009 and the sample sizes relate to employee-years. We eliminate employee-year observations when employees got promoted, as well as employees at senior positions. T-statistics are in brackets and based on robust standard errors, adjusted for clustering at the employee level. See Appendix for variable descriptions.

*, **, *** is significant at 10 percent, 5 percent, and 1 percent, respectively (two-tailed).