

# **Implicit incentives for human capital acquisition**

**Isabella Grabner<sup>a</sup>**

**Frank Moers<sup>ab</sup>**

<sup>a</sup> *Maastricht University School of Business and Economics*

<sup>b</sup> *European Centre for Corporate Engagement (ECCE)*

Second Draft

November 12<sup>th</sup> 2013

\* Address for correspondence: Maastricht University School of Business and Economics, Department of Accounting & Information Management, P.O. Box 616, 6200 MD Maastricht, The Netherlands.  
(P) +31433884629; (F) +31433884876; (Email) [i.grabner@maastrichtuniversity.nl](mailto:i.grabner@maastrichtuniversity.nl);  
[f.moers@maastrichtuniversity.nl](mailto:f.moers@maastrichtuniversity.nl)

## **Implicit incentives for human capital acquisition**

### **Abstract**

The accounting literature has largely recognized the power of effort incentives to increase 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 cannot 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. We investigate the complementary roles of two personnel control mechanisms, i.e., training and assignment of employees (i.e., promotions), in the active management of employees' human capital acquisition. In particular, we highlight the role of promotions in incentivizing employees to invest in job-specific human capital. We predict that different skill sets are predictors of different types of promotions. More specifically, training that increases effective ability (productivity) in the current job is predictive of promotions to similar task environments, while training that increases effective ability in the next job, but less so in the current job, is predictive of promotions to different task environments. We further predict that employees with promotion opportunities invest significantly more in those training that increase their chance of promotion than employees without promotion opportunities. Using panel data of a retail bank, we find evidence consistent with our predictions.

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

## I. INTRODUCTION

Performance measurement and incentives is an important and widely studied area in managerial accounting. Historically, this literature is based on incentive contracting theory, which has led to a focus on (i) explicit incentives and (ii) the provision of “productive effort”, hereafter effort (e.g., Gibbons & Roberts, 2013). Despite the literature’s focus on explicit effort incentives, it has been widely recognized that even in the absence of explicit bonus contracts, employees have implicit incentives to provide effort. In particular, the accounting literature has recognized the role of promotions in providing effort incentives (e.g., Campbell, 2008; Cichello, Fee, Hadlock, & Sonti, 2009; Ederhof, 2011; Gibbs, 1995). Also these studies are rooted in the incentive contracting literature where the prospect of a promotion is assumed to increase 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 cannot 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. In this study, we investigate the role of promotions in providing implicit incentives for human capital acquisition.

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 & Dyer, 2004). Accordingly, the identification, development, and retention of talent has become of utmost importance to firms. Firms manage this process through personnel control mechanisms that upgrade the effective ability of employees such as the selection, training, and assignment (i.e., promotion) of employees (Merchant, 1982). 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 & Van der Stede, 2012), research on these controls is still scarce. 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.

While certain personnel control mechanisms, such as selection (e.g., Campbell, 2012) and job assignment (e.g., Campbell, 2008; Grabner & Moers, 2013b) have received some attention, the management control 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 on the other hand has addressed human capital acquisition in depth. In this literature, human capital acquisition is assumed to increase the effectiveness of a given innate ability for job performance, i.e., increase the effective ability (see for example Gibbons & Waldman, 1999). This implies that, all else equal, employees with higher effective ability are more productive, and therefore of higher value to the firm. In principle, two different theoretical explanations for why the acquisition of human capital is related to promotions have emerged from this literature. First, promotions are seen as the natural result of the acquisition of skills that are more productive at higher levels on the job ladder (Gibbons & Waldman, 1999, 2006). More specifically, human capital accumulates with experience and at some point the employee's effective ability provides higher paybacks at the next hierarchical level, which makes it efficient to promote the employee. The second explanation is that promotions are designed to provide incentives for firm-specific human capital acquisition (Prendergast, 1993). That is, to provide incentives to employees to make human

capital investments and increase their effective ability, the firm creates a job ladder and a promotion rule that makes promotion more likely if the employee trains.

The two explanations are similar, in the sense that both explanations assume that it is efficient to assign an employee to the next job when sufficient human capital has been acquired. The main difference between the two explanations is that the first treats human capital acquisition as exogenous, while the second treats it as endogenous. Evaluating the empirical validity of these two theoretical explanations is not only important from a pure labor economics perspective, but even more so from a management control perspective. The reason for this is that, in contrast to the first explanation, the second explanation 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.

In particular, Prendergast (1993) focuses on the role of promotions to induce noncontractible firm-specific human capital investments, i.e., investments in skills that make workers more productive in one firm but not elsewhere (Becker, 1962). By committing to a promotion schedule that makes promotion more likely if employees acquire firm-specific skills, employees have the incentive to invest. While the theory is sound, it is empirically difficult to provide meaningful examples of skills that are really firm-specific (e.g., Lazear, 2009). As a result, a different view on firm-specific skills has recently been developed that assumes that all skills are general but the demand for these skills is specific to a firm and, more importantly, specific to a job (Gibbons & Waldman, 2006; Lazear, 2009). We follow this more recent view and focus on the role of promotions to induce investments in job-specific skills.

The concept of job-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. Because job assignments differ in the extent to which the nature of the tasks between the current job and the next job varies (see e.g., Grabner & 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). This implies that different skill sets are predictive of different types of promotions. More specifically, training that increases effective ability (productivity) in the current job is predictive of promotions to similar task environments, while training that increases effective ability in the next job, but less so in the current job, is predictive of promotions to different task environments. Although this prediction is consistent with promotions providing implicit incentives for human capital acquisition, it is also consistent with employees acquiring human capital for other reasons and subsequently being promoted when their effective ability is sufficiently high (e.g., Gibbons & Waldman, 1999). However, the incentive explanation implies a second prediction that distinguishes it from other explanations, which is that employees make more job-specific human capital investments in the presence of promotion opportunities than in the absence of such opportunities. In this study, we empirically test both predictions to provide evidence in favor of promotions inducing investments in job-specific skills.

To empirically address these issues, 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 received, and we are further able to distinguish four types of job assignments across the hierarchy: promotions to jobs with comparable tasks between hierarchical levels (which we label Type S promotions for similar tasks) and promotions that involve a small, medium, and large change in the nature of the task (respectively, Type D-low, D-medium, and D-

high promotions for different tasks). 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. Broadly speaking, we split training into those that do affect productivity in the current job and those that do not, where the former are also relevant for the next job in a Type S promotion setting and the latter are relevant for the next job in a Type D promotion setting, and more so in D-high. For now we label this training simply “current job training” and “non-current job training”.

Our empirical analysis proceeds in three steps. First, we validate our training categorization by showing that investments in current job training have immediate performance effects, but investments in non-current job training do not. Second, we show that an accumulation of human capital via current job training increases the probability of a Type S and Type D-low promotion, while an accumulation of human capital via non-current job training increases the probability of a Type D-medium and Type D-high promotion. These results are consistent with the expectation that different skill sets are predictive of different types of promotions. Finally, we exploit the fact that promotion opportunities vary across branches and find, both on the branch level and the employee level, that non-promoted employees invest more in current (non-current) job training in the presence of an opportunity for a Type S (Type D) promotion than in the absence of such an opportunity. 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.<sup>1</sup> While the incentive and sorting role of promotions can be conflicting when it comes down to the provision of effort incentives (Baker, Jensen, & Murphy, 1988; Grabner & Moers, 2013b), we provide empirical evidence in favor of Prendergast's (1993) argument that these roles are linked when it comes down to the provision of incentives for human capital acquisition.

Second, 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 empirical accounting literature. Our study fills this gap in the literature by examining the incentive problem of human capital acquisition and the role of personnel controls in addressing this problem.

Third, we contribute to the recent stream of literature on the interdependence between management control mechanisms (see Grabner & 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 job-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 job-specific skills capture important aspects of the original

---

<sup>1</sup> Pergamit and Veum (1999) and Melero (2010) provide evidence of an association between training and promotions. 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 promotions induce human capital investments, which is the core of our paper.



concept of firm-specific skills and are also empirically relevant, which makes it a fruitful area for future research (see also Gibbons & 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 hypotheses. 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.

## **II. THEORY DEVELOPMENT AND HYPOTHESIS**

The accounting literature has largely recognized the power of effort incentives to align employees' behavior with the objectives of the firm (e.g., Bushman, Indejejian, & Smith, 1995; Bushman, Indejejian, & Smith, 1996; Ittner, Larcker, & 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 cannot 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 (same effort leads to higher pay-off due to higher effective ability).

Within labor economics, a large stream of literature on careers in organizations has dealt with human capital acquisition. In this literature, human capital acquisition is assumed to increase the effectiveness of a given innate ability for job performance, i.e., increase the effective ability (see for example Gibbons & Waldman, 1999). This implies that, all else equal, employees with higher effective ability are more productive, and therefore of higher value to the firm. In principle, two broad, but different theoretical insights have emerged from this literature. The first

insight is that promotions are the result of the acquisition of skills that are more productive at higher levels on the job ladder (Gibbons & Waldman, 1999, 2006). More specifically, human capital accumulates with experience and at some point the employee's effective ability provides higher paybacks at the next hierarchical level, which triggers a promotion. The second insight is that promotions are designed to provide incentives for firm-specific human capital acquisition (Prendergast, 1993). That is, to provide incentives to employees to make human capital investments and increase their effective ability, the firm creates a job ladder and a promotion rule that makes promotion more likely if the employee trains. From a management control perspective, the second insight is of more interest because, in contrast to the first insight, it implies the active management of the two personnel control mechanisms training and job assignment. 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.

Prendergast (1993) focuses on the role of promotions to induce firm-specific human capital investments, i.e., investments in skills that make workers more productive in one firm but not elsewhere (Becker, 1962). In a nutshell the argument is as follows. While investments in firm-specific skills are valuable to the firm, and the firm would therefore be willing to pay for it, skill collection is noncontractible. This noncontractibility triggers employees not to invest in skill collection because they will only invest if they can expect a return, but the firm has an incentive to *ex-post* claim that skills have not been collected. Creating a job ladder in which skills are more productive and wages higher at higher hierarchical levels allows the firm to use the promotion opportunities as a commitment device. As a result, the employees' incentive to invest increases because these investments increase the probability of a promotion and thus higher pay. This already indicates that promotions do not only provide effort incentives, as recognized by the

accounting literature (Campbell, 2008; Ederhof, 2011; Gibbs, 1995), but also other types of incentives so far neglected in accounting research.

However, the concept of firm-specific human capital has been criticized for the difficulty of defining meaningful examples of skills that make workers more productive in their current firm but not elsewhere (see for example Lazear, 2009). Gibbons and Waldman (2006) refine the idea of firm-specific human capital by introducing job-specific human capital, i.e., human capital that is specific to the employee's job, as opposed to being specific to the firm.<sup>2</sup> This implies that some of the human capital that is relevant for the current job goes unutilized once an employee gets promoted to a job that requires different skills (or leaves the firm). 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 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, where these weightings vary across jobs within the job ladder (Gibbons & Waldman, 2006; see also Lazear, 2009).<sup>3</sup> 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.

The idea of job-specific human capital implies not only that investments in skills which 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. Combining the insights on promotion-based incentives for human capital acquisition with the

---

<sup>2</sup> Gibbons and Waldman (2006) use the term task-specific human capital, but we prefer to use the term job-specific human capital.

<sup>3</sup> 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.

idea of job-specific human capital, we argue that promotions do not provide incentives for any human capital acquisition, but for specific types of training. The type of incentive created depends on the degree to which skills become obsolete in the new job, or only relevant once moving to a new job, or said differently, the degree to which skills are relevant for both the current and the next job. The extent to which this is the case depends on the type of job assignment upon promotion.

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 & Moers, 2013b). When the tasks between the current and the next job are not significantly different, a similar skill set is relevant in both jobs. This implies that training that affects the current job can be expected to increase productivity (even more) in the next job. 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. 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. For example, a sales employee that already has acquired leadership skills will more likely to be suited to be a store manager than somebody that has no leadership experience. This argumentation has two consequences. First, employees that already have developed the skills necessary for the next job, i.e., they have made the relevant training investments, will be more likely to be promoted. Therefore, we argue that job-specific training that is relevant for the current job will be a relevant predictor of promotion decisions to similar task environments, while job-specific training that is related to the next rather than the current job are incorporated in promotion decisions to different task environments. Second, the prospect of

promotion creates incentives for employees to invest in those training programs that will increase their chance of getting promoted. Since training is costly to employees (less time available to reach productivity targets), employees that have promotion opportunities will invest more in those training programs that are relevant for the desired job position, since the expected pay-off for them is higher. Based on this argumentation, we formulate the following hypotheses.

*Hypothesis 1a: Job-specific training related to tasks currently performed affects promotions to jobs with similar task environments.*

*Hypothesis 1b: Job-specific training related to tasks relevant in the next job but less in the current job affects promotions to jobs with different task environments.*

*Hypothesis 2: All else equal, employees with promotion opportunities will conduct more job-specific training that exploits this opportunity than employees without promotion opportunities.*

### **III. RESEARCH SETTING AND MEASURES**

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.

### **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 four categories that can be directly linked to our theory: (1) product training, (2) team training, (3) leadership training, and (4) management training.<sup>4</sup> 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

---

<sup>4</sup> We exclude trainings 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.

products. Team training focuses on the development of team skills, such as efficient task division or conflict management within a team. 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. This assessment, as well as the training classification, were 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 these 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.

### **Job positions and career paths 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) and promotions that involve a significant change in the nature of the task (Type D promotions for different tasks).

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. Promotions 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.<sup>5</sup> This promotion, which we label “supervisor promotions”, involves a drastic change in the nature of tasks, especially for professionals.<sup>6</sup>

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.

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

---

<sup>5</sup> 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.

<sup>6</sup> 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.

## **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.

*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 3-step approach. In the meeting at the beginning of the year, (1) the objective sales targets are communicated and (2) targets regarding personal (career) development are negotiated. Further, for each employee an individual performance strategy is developed. 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, sales employees are evaluated with respect to (1) goal achievement concerning their assigned objective performance targets and (2) their personal and professional development during the year. Consequences of these performance appraisals are salary raises, bonus allocations, and career developments.

*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).<sup>7</sup> While the bonus allocation between groups is formula-based, the allocation to employees within groups is left to the discretion of supervisors to allow them to reward both current performance and professional development.

### **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 S and Type D promotions.<sup>8</sup> 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

---

<sup>7</sup> The sum of the individual targets within one group forms the overall performance target of the group for which the manager is responsible.

<sup>8</sup> We do consider promotions *to* supervisors (branch managers); these employees are eliminated from the sample once they are in their new role.

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 (SAP) 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.

*Training.* We measure training as the number of training days per year. As discussed, we distinguish four different types of training, which we label *PRODTRAIN* for product training, *TEAMTRAIN* for team 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 2 years, which we label

*SUMPRODTRAIN*, *SUMTEAMTRAIN*, *SUMLEADERTRAIN*, and *SUMMGMTRAIN*, respectively.

*Promotions and promotion opportunities.* 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 serves 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 opportunities as follows. For each hierarchical level within a branch, we assess whether there was a promotion opportunity in the respective branch. We label *PROMOPP* as 1 for all employees at a specific hierarchical level within a branch if at least one peer at the same hierarchical level 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 the empirical analysis, we further distinguish between Type S promotion opportunities and Type D promotion opportunities.

*Performance.* We measure employee performance in two different ways. *SALESPERF* represents an explicit formula-based measure capturing annual sales performance compared to target on the pre-determined set of performance measures. In particular *SALESPERF* is measured as the average target achievement of all performance measures in a particular year. We further

use *%BONUS*, i.e., the bonus as a percentage of salary, as an overall assessment of the employees' annual performance.

### **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 provide first insights that are consistent with our theory. First, product training is conducted by far 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 expectations since product training is not only relevant for certain promotions, but also for current productivity in any job. 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. Finally, no difference between team training is observed. 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**-----

#### IV. DATA ANALYSIS AND RESULTS

Our main objective is to investigate whether promotion opportunities create implicit incentives for human capital acquisition, i.e., incentivize employees to invest in training. To establish this link, we proceed in three steps. While both the human capital accumulation explanation and the incentive explanation result in the same predictions regarding the first two steps of the analysis, the third step of the analysis is able to distinguish between the two alternative explanations, and therefore the most crucial one.

First, we establish the link between training investments and current job performance to show that only certain types of training have immediate performance effects. In a second step, we analyze the relevance of different training types for different types of promotion decisions to show that (some) training might not directly influence performance, but still drive promotions. Finally, we investigate whether the opportunity of a promotion systematically affects the level of employees' investments in those training programs that are relevant for the desired type of promotion. To ensure that our results are not driven by those employees who actually got promoted, we restrict our analysis to non-promoted employees. Without eliminating promoted employees, there are multiple potential explanations for why employees have higher average training investments in branches with promotion opportunities: (1) promotions are the result of human capital accumulation, and these promotions can only occur if there is a promotion opportunity; (2) if there is a promotion opportunity, supervisors select certain employees to be promoted, and assign these particular employees to certain training programs; or (3) training investments are triggered by the opportunity to receive a promotion. Obviously, explanations (1) and (2) are driven by the promoted employees, while explanation (3) is not. By eliminating employees that received a promotion, these explanations drop out, and the difference in training

investments can only be explained by the difference in promotion opportunities, i.e., the incentive explanation.

### **Performance effects of training**

To corroborate the assumption underlying the job-specific human capital approach that some training is more relevant for current job performance than others, we first investigate the performance effects of the different training types. In particular, we expect product and team training to increase current job performance, while we do not expect an effect of leadership and management training. To estimate the effect of training on current job performance, we run the following regression models for our two performance measures, i.e., *SALESPERF* and *%BONUS*.

$$\begin{aligned}
 PERFORMANCE_{ijt} = & \beta_0 + \beta_1 PERFORMANCE_{ijt-1} + \beta_2 PRODTRAIN_{ijt} + \beta_3 TEAMTRAIN \\
 & + \beta_4 LEADERTRAIN + \beta_5 MGMTRAIN + \beta_6 SIZE_{jt} + \beta_7 HIERLEVEL_{ijt} \\
 & + \beta_8 JOBTENURE_{ijt} + \beta_9 AVR.JOBLENGTH_{ijt} + \beta_{10} GENDER_{ij} \\
 & + \beta_{11} FULL_{ijt} + \varepsilon_{ijt}
 \end{aligned}$$

where  $i$  relates to the employee,  $j$  to the group, and  $t$  to the year. We control for past performance to capture the immediate effect of training conducted in a given year on the change in performance. We also control for employee- and group-specific characteristics that might systematically affect the performance measures. 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. 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*). Finally, in estimating the equation we use job type (junior vs. professional vs. senior) fixed effects, year fixed effects, and standard errors clustered at the group level.

We report the results in Table 5, where Column I relates to *%BONUS* and Column II relates to *SALESPERF*. In line with expectations, we find that *PRODTRAIN* is positively and significantly related to increases in both performance measures, while *LEADERTRAIN* is not related to the measures. *MGMTRAIN* is not related to the overall performance assessment, and even decreases sales performance. The latter effect can be explained by the fact that management training has the least overlap with the current job and therefore is most challenging. Therefore, the conduct of these training programs can be expected to direct effort away from serving customers which in turn negatively affects sales performance. Contrary to expectations, *TEAMTRAIN* does not enhance current job performance. Potential explanations for this result might be that the performance measures we use capture individual performance instead of team performance, or that the benefits of team training for individual performance can only be exploited if the whole team conducts the training. From a bonus-based incentive perspective, these results imply that employees have incentives to only invest in product training to increase their annual compensation.

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

## Relevance of training in promotion decisions

As a second step, we analyze in how far different types of training are predictors of different types of promotion decisions. In particular, we predict that job-specific training that is relevant for the current job will be a relevant predictor of promotion decisions to similar task environments, while job-specific training that is related to the next rather than the current job is incorporated in promotion decisions to different task environments. To test our hypotheses, we estimate the impact of the four 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. In this specification, we aggregate the training over the last two years before the promotion to capture human capital accumulation.

In particular, we estimate the following regression model:

$$\begin{aligned} p(\text{PROMOTION})_{ijt+1} &= \beta_0 + \beta_1 \text{PERFORMANCE}_{ijt} + \beta_2 \text{SUMPRODTRAIN}_{ijt} + \beta_3 \text{SUMTEAMTRAN}_{ijt} \\ &+ \beta_4 \text{SUMLEADERTRAIN}_{ijt} + \beta_5 \text{SUMMGMTRAIN}_{ijt} + \beta_6 \text{SIZE}_{jt} + \beta_7 \text{HIERLEVEL}_{ijt} \\ &+ \beta_8 \text{JOBTENURE}_{ijt} + \beta_9 \text{AVR.JOBLENGTH}_{ijt} + \beta_{10} \text{GENDER}_{ij} \\ &+ \beta_{11} \text{FULL}_{ijt} + \varepsilon_{ijt} \end{aligned}$$

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

Since we measure employee performance in two distinct ways, we estimate a separate model for each performance measure. We report the results in Table 6, where Panel A relates to *%BONUS* as performance measure, and Panel B relates to *SALESPERF*. We expect that managers take current job performance into account when making promotion decisions, especially so for promotions to jobs with similar task environments. 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.<sup>9</sup> 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

---

<sup>9</sup> When an employee is in his/her first job, we set the *AVRJOBLENGTH* equal to *JOBTENURE*. Our inferences are not affected by this imputation.

all job types. Finally, in estimating the equation we use year fixed effects and standard errors clustered at the group level.

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

We find that, regarding past performance, *%BONUS* is a significant predictor of all promotion types, and with the exception of supervisor promotions, also is *SALESPERF*. This is not surprising given that *%BONUS* represents an overall assessment of the employee's job performance in the previous job, and *SALESPERF* only captures a specific part of this evaluation, i.e., objective sales performance – which is not a distinguishing skill for branch managers anymore.

Regarding the effect of training, we find results that are largely consistent with our predictions, and robust to the use of alternative performance measures. Product and team training are significant predictors of Type S and cross promotion, which both are characterized by (some) overlap between the current and the next job. Further, product training does not increase the probabilities of senior or supervisor promotions that involve a great(er) change in task environments, and team training even decreases the chance of promotion to these positions. The latter effect can be explained by the fact that these positions already require leadership skills, and when competing for such a promotion, investment in team training might be considered “too late”. 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 logical given that the position of branch manager is the first true management position in the hierarchy where process-oriented management skills are needed. Management training even decreases the

probability of a Type S promotion, indicating that these investments make an employee unqualified for a Type S promotion.

Overall, the results provide evidence that investments in the acquisition of human capital increase employees' promotion probabilities. Most importantly, although some types of training do not increase current productivity, they are significant predictors of promotions to positions that involve a significant change in the task environment. Although these results are consistent with promotions providing implicit incentives for human capital acquisition, they are also consistent with employees "randomly" following training programs and being promoted when their effective ability is sufficiently high. In the next section, we therefore explicitly test the impact of promotion opportunities on human capital acquisition.

### **Implicit incentives for human capital acquisition**

Given that specific training programs are predictors of promotion decisions, 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 does not occur randomly, but 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 compare mean training investments between employees with and without promotion opportunities, for the Type S and Type D promotion group, respectively. Based on our indicator variable *PROMOPP*, we split the Type S and the Type D samples between the presence (*PROMOPP*=1) and absence (*PROMOPP*=0) of promotion opportunities. As discussed earlier, we exclude the employee-year preceding a promotion of those who got promoted to ensure that promoted employees do not drive the results.

As a first test, we compare training investments on the branch level, i.e., we aggregate training investments over all years and branch employees for each respective subsample. The mean comparisons between the *PROMOPP=1* and the *PROMOPP=0* samples, which we report in Table 7, provide first indications that promotion opportunities indeed provide incentives for human capital acquisition. In the Type S group, only average investment in *PRODTRAIN* is significantly higher in branches that provide promotion opportunities. In the Type D group, average investment in all training, except for *TEAMTRAIN* is higher in branches belonging to the *PROMOPP=1* sample.

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

To provide a more rigorous test of our prediction, we extend this analysis to the employee level. Given that any observed mean difference in training investments between the samples might be driven by differences in employee characteristics, such as past performance or job tenure, we match employees from both samples based on multiple employee-level and branch-level characteristics. To find pairs of observations that are similar along these multiple characteristics, we use propensity score matching (Rosenbaum and Rubin 1983).<sup>10</sup> In the Types S (Type D) group, we are able to match 273 (222) employee-year observations with promotion opportunities to 273 (222) employee-year observations without promotion opportunities using a maximum difference between the propensity scores of one percentage point.<sup>11</sup> To test whether these pairs are indeed similar along the multiple characteristics, we perform a t-test for differences in means, none of which are statistically significant at the 0.10 level. As such, the propensity score matching procedure appears to control for observed employee characteristics.

---

<sup>10</sup> In particular, we match employees on lagged *%BONUS*, *JOBTENURE*, *AVRJOBLENGTH*, *SIZE*, *GENDER* and *FULL*.

<sup>11</sup> We restrict the Type D sample to professionals since there are not sufficient homogeneous observations of seniors for an appropriate matching procedure.

Table 8 reports the results for the mean comparisons between the matched samples. Consistent with expectations, employees in the Type S group, i.e., junior employees, conduct significantly more product and team training when they see an opportunity to receive a promotion compared to when they do not. In contrast, we find no difference between leadership and management training between the *PROMOPP*=1 and the *PROMOPP*=0 samples in the Type S group.

Examining the Type D group shows a different pattern. Employees with promotion opportunities invest significantly more in product, leadership and management training compared to employees without such an opportunity, but not in team training.

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

These findings provide direct evidence for our prediction that promotion opportunities create incentives to invest in the acquisition of human capital, and more specifically in training that increases employees' promotion probabilities. Type S promotions are driven by product and team training, for which we observe higher training investments of employees with promotion opportunities. On the other hand, Type D promotions are also driven by leadership and management training, which matches our expectation that Type D employees invest more these training programs once they see an opportunity for career development.

## V. 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 job-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 at least two 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 in Type S settings can be helpful in managing both inputs to employee productivity. 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. 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.



## REFERENCES

- Baker, G. P., Jensen, M. C., & Murphy, K. J. (1988). Compensation and incentives: Practice vs. theory. *Journal of Finance*, 43(3), 593-616.
- Becker, G. (1962). Investment in Human Capital: A Theoretical Analysis. *Journal of Political Economy*, 5(2), 9-49.
- Bushman, R., Indejejian, R., & Smith, A. (1995). Aggregate Performance Measures in Business Unit Manager Compensation: The Role of Intrafirm Interdependencies. *Journal of Accounting Research*, 33, 101-128.
- Bushman, R., Indejejian, R., & Smith, A. (1996). CEO compensation: The role of individual performance evaluation. *Journal of Accounting and Economics*, 21, 161-193.
- Campbell, D. (2008). Nonfinancial performance measures and promotion-based incentives. *Journal of Accounting Research*, 46(2), 297-332.
- Campbell, D. (2012). Employee selection as a control system. *Journal of Accounting Research*, 50(4), 931-966.
- Cichello, M. S., Fee, C. E., Hadlock, C. J., & Sonti, R. (2009). Promotions, turnover, and performance evaluations: Evidence from the careers of division managers. *The Accounting Review*, 84(4), 1119-1143.
- Ederhof, M. (2011). Incentive compensation and promotion-based incentives of mid-level managers: Evidence from a multinational corporation. *The Accounting Review*, 86(1), 131-153.
- Gibbons, R., & Roberts, J. (Eds.). (2013). *Economic Theories of Incentives in Organizations*. Princeton and Oxford: Princeton University Press.
- Gibbons, R., & Waldman, M. (1999). A theory of wage and promotion dynamics inside firms. *Quarterly Journal of Economics*, 114(4), 1321-1358.
- Gibbons, R., & Waldman, M. (2006). Enriching a Theory of Wage and Promotion Dynamics inside Firms. *Quarterly Journal of Economics*, 24(1), 59-107.
- Gibbs, M. (1995). Incentive compensation in a corporate hierarchy. *Journal of Accounting and Economics*, 19, 247-277.
- Grabner, I., & Moers, F. (2013a). Management Control as a System or a Package? Conceptual and Empirical Issues. *Accounting, Organizations and Society*, forthcoming.
- Grabner, I., & Moers, F. (2013b). Managers' Choices of Performance Measures in Promotion Decisions: An Analysis of Alternative Job Assignments. *Journal of Accounting Research*, 51(5), 1187-1220.
- Grant, R. M. (1996). Toward a knowledge-based theory of the firm. *Strategic Management Journal*, 17, 109-122.
- Hatch, N. W., & Dyer, J. H. (2004). Human Capital and Learning as a Source of Sustainable Competitive Advantage. *Strategic Management Journal*, 25, 1155-1178.
- Ittner, C. D., Larcker, D. F., & Rajan, M. V. (1997). The choice of performance measures in annual bonus contracts. *The Accounting Review*, 72(2), 231-255.
- Lazear, E. P. (2009). Firm-Specific Human Capital: A Skill-Weights Approach. *Journal of Political Economy*, 117(5), 914-940.

- Melero, E. (2010). Training and Promotion: Allocation of Skills or Incentives? *Industrial Relations*, 49(4), 640-667.
- Merchant, K. A. (1982). The Control Function of Management. *Sloan Management Review*, 23, 43-55.
- Merchant, K. A., & Van der Stede, W. A. (2012). *Management Control Systems: Performance Measurement, Evaluation and Incentives*: Financial Times Prentice Hall.
- Pergamit, M. R., & Veum, J. R. (1999). What Is a Promotion? *Industrial and Labor Relations*, 52(4), 581-601.
- Prendergast, C. (1993). The role of promotion in inducing specific human capital acquisition. *Quarterly Journal of Economics*, 108(2), 523.

## APPENDIX

### *Variable Descriptions*

<i>Variable</i>	<i>Description</i>
<i>PRODTRAIN</i>	number of product training days per year
<i>TEAMTRAIN</i>	number of team training days per year
<i>LEADERTRAIN</i>	number of leadership training days per year
<i>MGMTRAIN</i>	number of management training days per year
<i>%BONUS</i>	bonus as a percentage of salary
<i>SALESPERF</i>	the average target achievement of all performance measures in a particular year
<i>SALARY</i>	is the annualized monthly base salary in Euros.
<i>PROMOTION</i>	indicator variable that equals 1 for job changes representing advancements according to the company's internal job rating system, and 0 otherwise
<i>TYPE S PROMOTION</i>	refers to a promotion from a junior position to a professional position within the same customer category.
<i>CROSS PROMOTION</i>	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.
<i>SENIOR PROMOTION</i>	refers to a promotion to a senior position within the same customer category.
<i>SUPERVISOR PROMOTION</i>	refers to a promotion to a supervisor position.
<i>PROMOPP</i>	an indicator variable that equals 1 for all employees at a specific hierarchical level within a branch if at least one peer at this hierarchical level was promoted during our sample period, and 0 otherwise.
<i>AVR.JOBLENGTH</i>	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).
<i>JOBTENURE</i>	is the employee's tenure in the current job in years.
<i>HIERLEVEL</i>	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.
<i>SIZE</i>	is the number of employees within a group that share in the same bonus pool.
<i>GENDER</i>	is an indicator variable that equals 1 (0) if the employee is a male (female).
<i>FULL</i>	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 Values	Classification of customer groups being served by an employee based on a <i>hierarchical</i> customer segmentation model Standard customers - Wealthy customers - Commercial customers
Job type	Description Values	Hierarchy of jobs within each customer category Junior - Professional - Senior
Hierarchical level	Description Values	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 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	
<i>Job type</i>	<i>Job rating</i>	<i>Job type</i>	<i>Job rating</i>	<i>Job type</i>	<i>Job rating</i>	<i>Job position</i>	<i>Job rating</i>
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**

<b>from/ to</b>	Same customer category		Higher customer category			Outside	
	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
	<b>328</b>	<b>43</b>		<b>59</b>		<b>35</b>	<b>49</b>

**TABLE 2**  
*Descriptive statistics for training*

Variable	Promotion Group	%	n	Mean	Std	Median	Min	Max
<i>PRODTRAIN</i>	Type S (974)	87%	848	11.6	7.5	10.0	1	49
	Type D (1025)	77%	787	7.7	6.0	6.0	1	35
<i>TEAMTRAIN</i>	Type S (974)	2%	23	2.2	0.4	2	2	3
	Type D (1025)	4%	36	2.3	0.5	2	2	3
<i>LEADERTRAIN</i>	Type S (974)	8%	81	3.2	1.7	3	1	11
	Type D (1025)	15%	149	4.6	3.9	3	1	23
<i>MGMTRAIN</i>	Type S (974)	8%	73	3.0	0.5	3	2	4
	Type D (1025)	11%	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 four training types, respectively. *Column %* reports the percentage of employees that received at least one day of training in the respective training type. *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.

See Appendix for variable descriptions

**TABLE 3**  
*Descriptive statistics*

Variable	n	Mean	Standard Deviation	Q1	Median	Q3
Promotion rate	5,886	0.11	0.31	0	0	0
Salary	5,886	36,933	13,510	27,029	33,366	44,976
Bonus as % of Salary	5,886	5.00	4.13	1.99	4.03	6.89
Sales performance	5,886	-0.38	47.95	-29.83	-6.13	23.46
Average job length	5,886	6.1	5.7	2.4	3.8	7.6
Job tenure	5,886	4.3	3.7	1.4	3.0	6.1
Size	5,886	24	8	17	22	30
Gender	5,886	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

**TABLE 4**  
*Correlations between variables*

Variable	1	2	3	4	5	6	7	8	9	10
1 PRODTRAIN										
2 TEAMTRAIN	0.01									
3 LEADERTRAIN	-0.03**	0.01								
4 MGMTRAIN	0.08***	0.01	0.17***							
5 SALARY	-0.32***	0.03***	0.02	-0.01						
6 %BONUS	0.06***	0.03**	0.07***	0.09***	-0.07***					
7 SALESPERF	0.10***	0.02	0.01	0.01	-0.06***	0.42***				
8 AVR.JOBLENGTH	-0.29***	-0.00	-0.04***	-0.08***	0.46***	-0.12***	-0.04***			
9 JOBTENURE	-0.32***	0.00	-0.03**	-0.07***	0.30***	-0.10***	-0.03**	0.10***		
10 SIZE	-0.00	-0.04***	-0.01	0.02	-0.01	-0.10***	0.01	0.02	0.04***	
11 GENDER	-0.04***	0.02*	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 5,886 employee-years.

†, \*, \*\*, \*\*\* is significant at 15 percent, 10 percent, 5 percent, and 1 percent, respectively (two-tailed).

See Appendix for variable descriptions

**TABLE 5**  
*The Performance Effect of Training*

$$PERFORMANCE_{ijt} = \beta_0 + \beta_1 PERFORMANCE_{ijt-1} + \beta_2 PRODTRAIN_{ijt} + \beta_3 TEAMTRAIN_{ijt} + \beta_4 LEADERTRAIN_{ijt} + \beta_5 MGMTRAIN_{ijt} + \beta_6 SIZE_{jt} + \beta_7 HIERLEVEL_{ijt} + \beta_8 JOBTENURE_{ijt} + \beta_9 AVR.JOBLENGTH_{ijt} + \beta_{10} GENDER_{ij} + \beta_{11} FULL_{ijt} + \varepsilon_{ijt}$$

Variable	I	II
<i>Intercept</i>	18.17*** (2.16)	-98.23*** (29.21)
<i>PERFORMANCE<sub>t-1</sub></i>	0.55*** (0.03)	0.49*** (0.03)
<i>PRODTRAIN<sub>t</sub></i>	0.11*** (0.02)	0.62** (0.27)
<i>TEAMTRAIN<sub>t</sub></i>	-0.18 (0.34)	0.75 (2.08)
<i>LEADERTRAIN<sub>t</sub></i>	0.02 (0.06)	0.17 (0.55)
<i>MGMTRAIN<sub>t</sub></i>	0.05 (0.08)	-1.50* (0.82)
<i>SIZE<sub>t</sub></i>	0.00 (0.01)	0.06 (0.13)
<i>HIERLEVEL<sub>t</sub></i>	-0.97*** (0.12)	5.33*** (1.71)
<i>JOBTENURE<sub>t</sub></i>	-0.04** (0.01)	0.63*** (0.21)
<i>AVR.JOBLENGTH<sub>t</sub></i>	-0.05*** (0.01)	-0.27* (0.15)
<i>GENDER</i>	0.12 (0.14)	3.63** (1.60)
<i>FULL<sub>t</sub></i>	-0.13 (0.10)	-0.66 (1.64)
<i>Job type fixed effects</i>	yes	yes
<i>Year fixed effects</i>	yes	yes
Adjusted R <sup>2</sup>	0.438	0.267
n	4,045	4,045



Data used in the OLS estimation are for the time period 2004-2009 and the sample sizes relate to employee-years. Column I reports the results for *%BONUS* as the dependent variable, and Column II reports the results for *SALESPERF* as the dependent variable.

Standard errors (in parentheses) are adjusted for clustering of observations within groups over time.

†, \*, \*\*, \*\*\* is significant at 15 percent, 10 percent, 5 percent, and 1 percent, respectively (two-tailed).

See Appendix for variable descriptions

**TABLE 6**

*Multinomial Logit Analysis of the Relevance of Training in Promotion Decisions*

$$\begin{aligned}
 p(\text{PROMOTION})_{ijt+1} &= \beta_0 + \beta_1 \text{PERFORMANCE}_{ijt} + \beta_2 \text{PRODTRAIN}_{ijt} + \beta_3 \text{TEAMTRAIN}_{ijt} \\
 &+ \beta_4 \text{LEADERTRAIN}_{ijt} + \beta_5 \text{MGMTRAIN}_{ijt} + \beta_6 \text{SIZE}_{jt} + \beta_7 \text{HIERLEVEL}_{ijt} \\
 &+ \beta_8 \text{JOBTENURE}_{ijt} + \beta_9 \text{AVR.JOBLENGTH}_{ijt} + \beta_{10} \text{GENDER}_{ij} \\
 &+ \beta_{11} \text{FULL}_{ijt} + \varepsilon_{ijt}
 \end{aligned}$$

PANEL A: *Performance measured as bonus as a percentage of salary*

Variable	Type S promotions	Cross promotions	Senior promotions	Supervisor promotions
<i>Intercept</i>	-1.00 (2.81)	-17.50*** (6.28)	30.02*** (8.46)	6.78 (7.40)
<i>PERFORMANCE<sub>t</sub></i>	0.05*** (0.01)	0.10*** (0.03)	0.09** (0.04)	0.11*** (0.04)
<i>PRODTRAIN<sub>t</sub></i>	0.05*** (0.01)	0.08*** (0.02)	0.04 (0.04)	-0.04 (0.06)
<i>TEAMTRAIN<sub>t</sub></i>	0.24*** (0.05)	0.57* (0.30)	-6.14*** (0.44)	-5.44*** (0.44)
<i>LEADERTRAIN<sub>t</sub></i>	0.07 (0.06)	-0.28 (0.26)	0.19*** (0.04)	0.23*** (0.07)
<i>MGMTRAIN<sub>t</sub></i>	-0.47*** (0.11)	-0.01 (0.20)	0.13 (0.20)	0.53*** (0.20)
<i>SIZE<sub>t</sub></i>	0.01* (0.01)	0.02 (0.02)	0.03 (0.02)	0.00 (0.02)
<i>HIERLEVEL<sub>t</sub></i>	-0.89*** (0.17)	0.69* (0.37)	-2.20*** (0.54)	-0.75* (0.45)
<i>JOBTENURE<sub>t</sub></i>	-0.04 (0.03)	-0.24* (0.13)	-0.05 (0.06)	-0.01 (0.05)
<i>AVR.JOBLENGTH<sub>t</sub></i>	0.00 (0.02)	-0.01 (0.03)	0.02 (0.02)	-0.11** (0.04)
<i>GENDER</i>	0.08 (0.11)	0.27 (0.30)	-0.20 (0.27)	0.69 (0.54)
<i>FULL<sub>t</sub></i>	0.10 (0.19)	0.02 (0.42)	0.88 (0.6)	0.04 (0.79)
Job type fixed effects	yes			
Year fixed effects	yes			
Pr > ChiSq	<0.001			
n	4,656			

PANEL B: Performance measured as sales performance compared to target

Variable	Type S promotions	Cross promotions	Senior promotions	Supervisor promotions
<i>Intercept</i>	4.01 (2.84)	-10.93** (5.21)	32.71*** (8.32)	10.45* (6.01)
<i>PERFORMANCE<sub>t</sub></i>	0.01*** (0.00)	0.01*** (0.00)	0.01*** (0.00)	-0.01 (0.01)
<i>PRODTRAIN<sub>t</sub></i>	0.05*** (0.01)	0.08*** (0.02)	0.05 (0.04)	-0.02 (0.05)
<i>TEAMTRAIN<sub>t</sub></i>	0.24*** (0.04)	0.63** (0.25)	-6.08*** (0.41)	-5.25*** (0.39)
<i>LEADERTRAIN<sub>t</sub></i>	0.06 (0.07)	-0.28 (0.25)	0.19*** (0.05)	0.22*** (0.07)
<i>MGMTRAIN<sub>t</sub></i>	-0.47*** (0.11)	0.05 (0.19)	0.17 (0.20)	0.61*** (0.20)
<i>SIZE<sub>t</sub></i>	0.01 (0.01)	0.01 (0.02)	0.02 (0.02)	0.00 (0.02)
<i>HIERLEVEL<sub>t</sub></i>	-1.17*** (0.17)	0.34 (0.31)	-2.33*** (0.53)	-0.96*** (0.37)
<i>JOBTENURE<sub>t</sub></i>	-0.04 (0.03)	-0.27* (0.14)	-0.06 (0.06)	-0.00 (0.05)
<i>AVR.JOBLENGTH<sub>t</sub></i>	-0.01 (0.02)	-0.02 (0.03)	0.02 (0.03)	-0.12*** (0.05)
<i>GENDER</i>	0.03 (0.11)	0.24 (0.31)	-0.25 (0.27)	0.68 (0.53)
<i>FULL<sub>t</sub></i>	0.17 (0.19)	0.11 (0.43)	0.94 (0.62)	0.09 (0.77)
Job type fixed effects	yes			
Year fixed effects	yes			
Pr > ChiSq	<0.001			
n	4,656			

**TABLE 6- Continued**

---

Data used in the multinomial logit estimation are for the time period 2004-2009 and the sample size relates to employee-years. Panel A (B) reports the results when performance is measured as %*BONUS* (*SALESPERF*). Standard errors (in parentheses) are adjusted for clustering of observations within groups over time. \*, \*\*, \*\*\* is significant at 10 percent, 5 percent, and 1 percent, respectively (two-tailed). See Appendix for variable descriptions

**TABLE 7***Implicit Incentives for Human Capital Acquisition on Branch Level*

Variable	Promotion Group	<i>PROMOPP=1</i>		<i>PROMOPP=0</i>		Difference
		Mean	n	Mean	n	
<i>PRODTRAIN</i>	Type S	4.29	188	3.26	105	1.04***
	Type D	2.40	142	1.22	284	1.18***
<i>TEAMTRAIN</i>	Type S	0.02	188	0.02	105	0.00
	Type D	0.03	142	0.04	284	-0.01
<i>LEADERTRAIN</i>	Type S	0.15	188	0.10	105	0.05
	Type D	0.43	142	0.17	284	0.46***
<i>MGMTRAIN</i>	Type S	0.11	188	0.19	105	-0.08*
	Type D	0.16	142	0.07	284	0.09**

Data are for the time period 2004-2009 and the sample sizes relate to branch-hierarchical level observations. The table reports the average training investments aggregated per hierarchical level and branch, with and without promotion opportunities, where *Column Difference* reports the mean differences between the two samples.

†, \*, \*\*, \*\*\* is significant at 15 percent, 10 percent, 5 percent, and 1 percent, respectively (two-tailed).

See Appendix for variable descriptions.

**TABLE 8***Implicit Incentives for Human Capital Acquisition on Employee Level*

Variable	Promotion Group	<i>PROMOPP=1</i>		<i>PROMOPP=0</i>		Difference
		Mean	n	Mean	n	
<i>PRODTRAIN</i>	Type S	3.99	273	3.18	273	0.81**
	Type D	2.35	222	1.50	222	0.85***
<i>TEAMTRAIN</i>	Type S	0.05	273	0.01	273	0.04 <sup>†</sup>
	Type D	0.01	222	0.01	222	0.00
<i>LEADERTRAIN</i>	Type S	0.09	273	0.04	273	0.05
	Type D	0.25	222	0.08	222	0.17**
<i>MGMTRAIN</i>	Type S	0.20	273	0.12	273	0.08
	Type D	0.14	222	0.05	222	0.09*

Data are for the time period 2004-2009 and the sample sizes relate to employee-year observations. The table reports the mean training investments of employees with and without promotion opportunities, where *Column Difference* reports the mean difference between the two samples.

<sup>†</sup>, \*, \*\*, \*\*\* is significant at 15 percent, 10 percent, 5 percent, and 1 percent, respectively (two-tailed).

See Appendix for variable descriptions