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## Target Setting in Hierarchies: The Role of Middle Managers

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### ABSTRACT

We explore how a supervisor's hierarchical rank affects the extent to which employees' targets reflect their past performance. Literature documents that supervisors do not fully ratchet targets for past performance, arguably because the commitment not to penalize successful employees with more difficult targets alleviates the severity of the ratchet effect. We argue that commitment is less credible in organizational hierarchies where a middle manager sets employees' targets. Using data from an organization comprised of three hierarchical layers, we consistently find that a middle manager's exposure to performance pressure is positively associated with the ratcheting of the employees' targets. Moreover, we show that management at headquarters reduces a middle manager's performance pressure when most of her employees missed their targets in the previous period. Overall, the results imply that

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the hierarchical rank is an important determinant of the credibility of a supervisor's commitment to deemphasize past performance in target setting.

**JEL codes:** D22, M12, M41, M54

**Keywords:** target setting; hierarchy; supervisor

### 1. *Introduction*

Literature documents that supervisors do not fully ratchet or adjust targets for past performance, implying that successful employees are likely to meet their targets again (e.g., Indjejikian and Nanda [2002], Indjejikian and Matějka [2006], Indjejikian et al. [2014a]).<sup>1</sup> This target-setting practice is interpreted as an optimal response to underlying dynamic adverse selection or moral hazard problems. In the context of an adverse selection problem, the principal grants the successful agent an information rent via an easier target to motivate the agent to reveal their private information (Baron and Besanko [1984]); in the context of a moral hazard problem, the principal does not penalize the successful agent with a more difficult target to keep the agent from holding back performance (i.e., the ratchet effect; Indjejikian et al. [2014b]). Both mechanisms rely on the principal's commitment to the target-setting practice. Although the commitment is credible for firm owners facing substantial reputational damages in case of deviating target-setting practices, commitment is likely lacking when targets are set by middle managers who are exposed to targets themselves. We explore how the supervisor's organizational ranking as a middle manager affects the extent to which employees' targets reflect past performance.

Our study is set in a three-layer hierarchical firm. The three actors are the principal (i.e., management at headquarters), a middle manager or supervisor (i.e., regional manager), and an agent assigned to the middle manager (i.e., subsidiary manager reporting to a regional manager). The principal sets a target for the middle manager who, in turn, sets a target for the agent (Melumad et al. [1992]). The middle-manager contribution originates in the amount of information the principal must process to create conditions where the firm's information-processing capacity and the information supplied by its agent are synchronized (e.g., Radner [1993]).

Target setting by a middle manager comes at the cost of the principal's long-term considerations. Specifically, literature suggests the benefits of asymmetric target ratcheting accrue when the supervisor grants a successful agent some slack via a roll-over target and sets a tighter target for a failing agent (e.g., Leone and Rock [2002]). When a middle manager sets the agent's target, the ratcheting of the agent's target likely depends on the performance pressure implied by the manager's own target. A failing

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<sup>1</sup> We refer to a "successful" employee or agent as an individual who met the previous period's target. Reversely, we refer to a "failing" agent as an individual who missed the previous period's target.

middle manager is arguably exposed to performance pressure; to achieve next period's target, the manager thus chooses a myopic target-setting practice that prioritizes short-term over long-term considerations. We predict that a failing middle manager more strongly adjusts the agent's target for past performance than a successful middle manager. By increasing the target for a successful agent, the manager increases her short-term performance if the target is challenging but achievable (i.e., the manager reduces the agent's slack), but doing so likely induces the ratchet effect where the agent holds back performance. By reducing the target for a failing agent, the manager increases her short-term performance if the target is achievable and thus more effective, but doing so does not sufficiently penalize a failing agent. Thus, by strongly adjusting the agent's target for past performance, the failing middle manager strengthens the agent's short-term (or ex-post) incentives at the cost of the long-term (or ex-ante) incentives.<sup>2</sup>

Our findings are consistent with our predictions. Using 2,160 subsidiary-month observations in the period 2011 to 2016, we show that the extent to which a regional manager incorporates in her target setting the subsidiary managers' target achievements is associated with the regional manager's own target achievement (where target achievement is measured as the relative difference in a manager's actual and target). Specifically, we provide evidence that a failing regional manager more strongly increases targets for successful subsidiary managers and more strongly decreases targets for failing subsidiary managers, relative to a successful regional manager.

To corroborate, we examine the association between a regional manager's target achievement and her subsidiary managers' target achievement persistence. We find that the serial correlation in subsidiary managers' target achievements decreases or even becomes insignificant when the regional manager missed her own target in the previous period. That is, target achievement persistence is low when a failing regional manager faces short-term performance pressure. Collectively, the findings suggest that performance pressure incites a supervisor to adjust lower-level employees' targets for past performance, that is, a supervisor's performance pressure is positively associated with the supervisor's myopic target ratcheting.

In additional analysis, we study the supervisor's incentives that are set by headquarters. We examine to what extent headquarters considers the potentially adverse consequences of a failing regional manager's myopic target setting for subsidiary managers' long-term incentives. We show that headquarters adjusts a regional manager's target for the manager's own target achievement but also for the target achievements of those subsidiary

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<sup>2</sup> The literature on strategic delegation suggests that delegating decision authority to a middle manager can yield a stronger commitment, relative to the commitment when the principal retains the decision authority (e.g., Schelling [1960], Vickers [1985]). Arnold et al. [2023] argue and find that delegation of decision authority strengthens commitment to target-setting practices. Notably, our empirical setting features no variation in middle managers' decision authority.

managers assigned to the regional manager. Specifically, headquarters decreases a failing regional manager's target if the underperformance is driven by several failing subsidiary managers within the region. This finding suggests that headquarters reduces a failing supervisor's performance pressure if the target failure is likely due to external reasons. As performance pressure incites the supervisor to adjust employees' targets for past performance, our results suggest that headquarters' target setting at the supervisory level reflects the implied supervisor's myopic target ratcheting for lower-level employees.

Our study makes several contributions to the target-setting literature. First, literature documents that although supervisors adjust employees' targets for past performance (Weitzman [1980], Leone and Rock [2002], Kim and Yang [2010], Bouwens and Kroos [2011]), supervisors are reluctant to fully reflect employees' past performance in future targets (Indjejikian and Nanda [2002], Indjejikian and Matějka [2006], Indjejikian et al. [2014a]). This target-setting practice has been interpreted as an optimal solution to dynamic incentive problems. By committing to not fully update employees' targets for past performance, a supervisor reduces the likelihood that employees reduce effort toward the end of the period to avoid difficult targets in the next period. Our study suggests that this commitment is less effective in hierarchies with multiple layers of management where the supervisor is subject to performance evaluation relative to target herself. We find that a failing regional manager more strongly adjusts subsidiary managers' targets for past performance, relative to a successful regional manager. We thereby contribute to studies examining the determinants of commitment in target setting (e.g., Aranda et al. [2014], Bol and Lill [2015], Casas-Arce et al. [2018]).

More generally, we contribute to the literature on supervisors' discretion in target setting. Literature shows that supervisors use diverse information sources to set employees' targets (e.g., Indjejikian and Nanda [2002], Leone and Rock [2002], Bouwens and Kroos [2011], Aranda et al. [2014], Bol and Lill [2015], Holzhaecker et al. [2019]). Experimental evidence by Feichter [2023] highlights the role of a supervisor's past performance in lower-level jobs. Bol et al. [2010] study a supervisor's discretion in allocating sales targets to individual stores, emphasizing employees' risk tolerance. Our findings suggest that target setting is driven not only by the available information, but also by the supervisor's own target-related incentives to use that information.

Second, our study highlights the role of the hierarchy in shaping target-setting practices, thereby addressing the call by Feichter et al. [2018] and Matějka [2018] for more research on the interrelation of targets along the hierarchy. Specifically, we find that failing regional managers strongly ratchet targets. In turn, the management at headquarters reduces failing regional managers' targets and, thus, performance pressure in case most of the region's subsidiary managers missed their targets in the previous period. Taken together, these findings suggest that even though the

supervisor is responsible for setting lower-level employees' targets, headquarters indirectly influences employees' incentives through the supervisor's incentives. By reducing a failing supervisor's performance pressure, headquarters mitigates potentially adverse consequences of the supervisor's myopic target setting for employees' long-term incentives.

## 2. Literature Review and Hypothesis Development

We study a three-tier hierarchy (Laffont [1990]), comprising the principal of the firm, a middle manager, and an agent. The agent provides unobservable effort, which results in products delivered to the firm's customers. The middle manager motivates agent effort and implements policies the principal develops to advance the firm. This implementation includes ratification and monitoring of agent initiatives and submitting these initiatives for ratification to the principal (Fama and Jensen [1983]). Although the principal could execute these tasks herself, it would require too much of her valuable time to directly interact with the agent. In other words, it is more efficient for the principal to delegate these tasks to the middle manager (e.g., Baiman et al. [1995], Hofmann and Indjejikian [2018]).<sup>3</sup>

In the hierarchy, the principal sets a target for the middle manager who, in turn, sets a target for the agent. An objective means to set next period's target is to use past performance to motivate a target level, that is, targets are ratcheted (e.g., Leone and Rock [2002], Bouwens and Kroos [2011]). Revising targets based on past performance introduces a dynamic incentive problem where the manager (agent) anticipates that favorable performance will lead the principal (manager) to set a more difficult future target and, thus, the manager (agent) holds back performance (i.e., the ratchet effect; Indjejikian et al. [2014b]). In other words, although it is optimal to refrain from target ratcheting from an ex-ante perspective, it is attractive to ratchet targets from an ex-post perspective.

Based on analytical work, Indjejikian et al. [2014b] argue that the dynamic incentive problem is mitigated when the supervisor credibly commits to disregard or deemphasize information about past performance for target setting (Baron and Besanko [1984], Indjejikian and Nanda [2002]). As a benchmark, consider the case where the principal sets the agent's target. If the principal credibly commits that favorable performance is not used to increase the target, the agent has strong incentives to exert effort and earns a rent that is increasing in the agent's productivity. Importantly,

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<sup>3</sup> Investigating a hierarchical communication model, Honryo and Miura [2023] examine the benefit of employing a middle manager. In their model, the principal learns about the agent's private information (1) indirectly by communicating with the middle manager who also observes the agent's signal or (2) directly by observing the signal through costly investigations. They show that it is suboptimal for the principal to run the organization without a middle manager even if the cost of investigation is small and the middle manager provides biased reports.

the agent's rent implies a serial correlation in target achievements (i.e., a successful agent tends to remain successful). In contrast, if the agent expects the principal to renege on her commitment to disregard or deemphasize information about past performance for target setting, the agent has weaker incentives to exert effort, yielding an output that is lower than it would be if the principal credibly commits not to ratchet the target.

Following Indjejikian et al. [2014b], the commitment to disregard or deemphasize past performance information in an ongoing relationship can be achieved in several ways. A credible way to show commitment is to make renegotiations more costly to the principal. For example, it may be imperative for a firm to build a nonratcheting reputation if the competition for agents is stiff (e.g., Kanemoto and MacLeod [1992]). In a stochastic production setting, past performance may be construed as a noisy signal of the agent's performance potential so that the principal cannot directly infer from the observable achievements what the most likely future performance is. Biasing down the initial target constitutes a *de facto* commitment, implying that the agent's rent diminishes over time as more information becomes available (Jeitschko et al. [2002]).

In a setting where the middle manager sets the agent's target, we argue that it is less likely for the middle manager as compared to the principal to honor a commitment to disregard or deemphasize past performance information as the middle manager has a shorter horizon than the principal, thus reducing the relevance of reputational considerations. The principal arguably adopts a long-term perspective since the value of the firm is not enhanced with only taking decisions that are best for short-term profit. In contrast, the middle manager adopts a short-term perspective if the manager intends to retire or to depart the firm soon (Indjejikian et al. [2014b]) and when the principal makes promotion decisions based on the manager's performance (Campbell [2008]).<sup>4</sup>

The middle manager's exposure to performance targets amplifies the effect of the manager's short horizon. We argue that the middle manager who missed the target in the previous period is exposed to performance pressure such that the manager prioritizes short-term over long-term considerations, pushing for a short-term performance improvement even if it comes at the cost of diluting the agent's long-term incentives. By more strongly

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<sup>4</sup> Following the literature on strategic delegation, delegating decision authority to a middle manager can yield a stronger commitment relative to the commitment when the principal retains decision authority (e.g., Schelling [1960], Vickers [1985]). However, adding layers of hierarchy reduces the middle manager's influence on lower-level employees' targets and therefore undermines the manager's ability to commit if the principal (or other higher-level managers) retains some control over lower-level targets. In our empirical setting, management at headquarters is broadly involved in setting subsidiary managers' targets (e.g., by choosing overall target growth rates). Also, our empirical setting features no variation in middle managers' decision authority, that is, any potential influence of strategic delegation on the middle managers' commitment for target setting is held constant.

adjusting the agent's target for past performance, the middle manager increases the likelihood to achieve her target in the next period. Specifically, increasing the target for a successful agent, the middle manager increases her short-term performance if the target is challenging but achievable (i.e., the manager reduces slack in the agent's target); by reducing the target for a failing agent, the manager increases her short-term performance if the target is achievable and thus more effective. This discussion results in the following hypothesis:

*H1:* A failing middle manager more strongly adjusts the agent's target for past performance, relative to a successful middle manager.

### 3. Research Design

#### 3.1 THE RESEARCH SITE

*3.1.1. Overview.* This study relies on data from a listed corporation headquartered in Germany that employs engineers who provide technical services to customers. We collect data in one division of the corporation, which is organized in three hierarchical layers: headquarters, five regional units, and 30 subsidiary units, where the number of subsidiaries per region varies from two to eight. Regional and subsidiary units are not legally independent entities. All units are in Germany and are comparable in terms of maturity. Management at headquarters represents the principal, regional managers represent middle managers, and subsidiary managers represent agents. For the period 2011 to 2016, we have data at the subsidiary level. We also conducted qualitative semistructured interviews with one manager at headquarters and three regional managers to get a better understanding of the target-setting process and the managers' incentives.

*3.1.2. Target Setting.* The firm's shareholders hold the firm's management responsible for its performance, including providing high-quality services to customers and financial performance. The shareholders set a firm-wide target or quota that is subsequently cascaded down to the firm's divisions. In a quota system, supervisors allocate a fixed (sales) target to lower-level managers in the hierarchy (Sohoni et al. [2011]).<sup>5</sup> Within each division, consistent with Anthony and Govindarajan [2001], Fisher et al. [2002], and Umaphathy [1987], the firm uses participative budgeting in the form of negotiations, whereby regional managers have control over subsidiary managers' targets. As the firm is exposed to a tight labor market where employees need special education and certification to provide the firm's services, it is important for the firm to set attainable targets to retain its employees.

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<sup>5</sup> In our setting, sales metrics are a focal performance measure. Consistent with Leone et al. [2006, p. 2]: "Quota setting is an integral part of the planning and control systems of most sales organizations." In fact, close to 90% of all sales organizations use quotas (Oyer [2000]).



Target setting is comprised of three stages. In the first stage, the nonexecutive board presents to management at headquarters the firm-level sales target for the next year. From interviews with management at headquarters, we learned that headquarters has little to no say in this process, other than to advise the board on the feasibility of the firm-level target.<sup>6</sup> In the second stage, for each division, management at headquarters develops a roadmap that uses the firm-level sales target as the starting point. An important element of the roadmap is a growth target to meet the firm-level target. Managers probe alternative target allocations for the different regions to select targets (quota) for the regional and subsidiary managers that collectively produce the required growth. To identify alternative allocations, management at headquarters collects data related to the firm's strategy, market developments, capacity restrictions, regulation, and historical performance at the regional and subsidiary levels. Headquarters communicates intensively with regional managers, who in turn interact with the region's subsidiary managers. The second stage results in annual targets for each regional manager and broken down in monthly targets to reflect the region's specific conditions. At this point, a regional manager's target can no longer be changed.

In the third stage, each regional manager further discusses targets with the region's subsidiary managers. By design, the regional manager's (sales) target equals the sum of her subsidiary managers' (sales) targets. The regional manager uses information on subsidiary managers' past performance, peer comparisons, capacity restrictions, and demand potentials (e.g., the number of potential customers) to evaluate the appropriateness of her subsidiary managers' targets. Based on the assessment, the regional manager may revise subsidiary managers' targets to ensure achievable targets. Since at this stage the regional manager's target is fixed, the regional manager must trade off a target reduction for one subsidiary manager against a target increase for another subsidiary manager. Although the regional manager can reconsider her subsidiary managers' targets, she is still required to seek approval from headquarters for target revisions.

*3.1.3. The Role of the Regional Manager.* The design of the target-setting process suggests that a regional manager plays two roles: First, the manager serves as an information intermediary between management at headquarters and the region's subsidiary managers. Compared to management at headquarters, from the interactions with her subsidiary managers, the regional manager has superior information on the region's performance potential. Headquarters personnel emphasized to us that the information

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<sup>6</sup>The first stage of target setting is comparable to a setting where financial analysts formulate earnings expectations (i.e., earnings targets) for a firm, which become an important determinant of internal targets (e.g., Kwon et al. [2018]). Similar to our setting, managers may use their information advantage to guide analysts toward beatable earnings expectations (see, for instance, Cotter et al. [2006]).

provided by the regional managers was important to set difficult but attainable targets.

Second, the regional manager supervises the region's subsidiary managers and coordinates their affairs. In addition to setting targets for the region's subsidiary managers, the regional manager organizes monthly meetings with her subsidiary managers to discuss and benchmark performance, examine market developments, identify reasons for underperformance, and single out best practices to improve long-run performance. Identifying her subsidiary managers' performance potentials enables the regional manager to set attainable subsidiary managers' targets. Accordingly, a regional manager described her role as a "navigator" who must make sure that the subsidiary managers "sail in the right direction."

*3.1.4. The Incentive System.* The regional and subsidiary managers have explicit and implicit incentives to meet their targets. The explicit incentives follow from an annual bonus contingent on the overall performance that is an aggregate of three dimensions: financial performance of the own unit, contribution to the financial performance of the unit at the next higher hierarchical level, and personal performance (e.g., qualitative targets such as successful introduction of a new product or improved communication with clients). In the following, we focus on the own unit's financial target measured as sales target. The annual bonus for 100% target achievement amounts to 10% to 15% of a manager's baseline salary. A lower performance will be rewarded by a proportion of the maximum bonus. From the interviews with the regional managers, we also learned that target achievements have consequences for personnel development (i.e., promotions in case of continuous target overperformance or displacements in case of continuous target underperformance).

The implicit incentives follow from regular and irregular face-to-face meetings with a manager's supervisor. For example, once per month, each subsidiary manager meets with his regional manager to analyze and compare target achievements, identify best practices, and develop new strategies and processes. In addition, if the subsidiary manager did not meet his monthly target while the peers do, his regional manager calls for an individual meeting together with successful subsidiary managers and a manager from headquarters to identify reasons for underperformance, discuss measures to improve performance, and organize onsite coaching sessions. Similar measures are in place for each regional manager and her relations with management at headquarters. From the interviews, we learned that the regular and irregular face-to-face meetings create strong incentives for the regional and subsidiary managers to meet their monthly targets.

## 3.2 SAMPLE

Our sample consists of monthly data on five regions and 30 subsidiaries during the period 2011 to 2016, resulting in 360 region-month observations and 2,160 subsidiary-month observations. The sample construction is summarized in table 1.

**TABLE 1**  
*Sample Construction*

Panel A: The region level											
	Years										
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Total
# observations with available $A_{r,t}$	60	60	60	60	60	60	60	60	60	60	600
# observations with available $A_{r,t}$ & $B_{r,t}$				60	60	60	60	60	60	60	420
# observations with available $A_{r,t-1}$ & $B_{r,t-1}$					60	60	60	60	60	60	360
Final Sample											360

Panel B: The subsidiary level											
	Years										
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Total
# observations with available $a_{s,t}$	360	360	360	360	360	360	360	360	360	360	3,600
# observations with available $a_{s,t}$ & $b_{s,t}$				360	360	360	360	360	360	360	2,520
# observations with available $a_{s,t-1}$ & $b_{s,t-1}$					360	360	360	360	360	360	2,160
Final Sample											2,160

In this table, we present the sample construction. The sample includes monthly observations of five regions and 30 subsidiaries for the time period 2011 to 2016.  $r$  indicates the region,  $s$  indicates the subsidiary, and  $t$  indicates the period. Variable definitions:

$A_{r,t}$  = actual sales per region  $r$  in period  $t$ ;  $B_{r,t}$  = sales targets per region  $r$  in period  $t$ ;  $a_{s,t}$  = actual sales per subsidiary  $s$  in period  $t$ ; and  $b_{s,t}$  = sales targets per subsidiary  $s$  in period  $t$ .

The firm's business follows a seasonal pattern, where the busy season occurs from March to July, suggesting that comparing sales targets for adjacent months provides limited insight. Consequently, for the target-setting analysis, we use a one-year lag. This approach also reflects the characteristic of target setting in that monthly targets are set once a year.

We analyze monthly data for two reasons. First, in this setting, monthly sales data contain incremental information beyond annual sales data (e.g., more timely measure of performance improvements, signal of whether subsidiary managers are on track in terms of cumulative actual performance relative to the annual target, role of seasonality). An interview with management at headquarters confirms that regional managers track their subsidiary managers' monthly actual-target variances to intervene if necessary. Second, regional managers meet with their subsidiary managers each month to discuss and benchmark performance, suggesting that monthly

targets and target achievements relate to monthly feedback and real-time business decisions.<sup>7</sup>

### 3.3 CHAIN OF EVIDENCE

To test H1, we examine whether a regional manager (i.e., the middle manager) adjusts her subsidiary managers’ (i.e., the agents) targets for past performance conditional on her own past performance. We run two types of analyses: First, we analyze the extent to which subsidiary managers’ target achievements in the previous period explain their next period targets and whether this association differs for those subsidiary managers whose target is set by a regional manager who met her target (henceforth: successful regional manager) from those subsidiary managers whose target is set by a regional manager who missed her target (henceforth: failing regional manager). We expect that a failing regional manager more strongly ratchets her subsidiary managers’ targets for past performance than a successful regional manager. In this target ratcheting analysis, the target ratcheting coefficients may be biased as they reflect not only incentives but also persistence in target achievement. To alleviate the bias, we follow Kim et al. [2023] and include forward-looking measures that account for persistent shocks or predictable future performance.

Second, we run serial correlation analyses (Matějka et al. [2023]) and examine whether the serial correlation of subsidiary managers’ target achievements differs for successful versus failing regional managers. We expect the serial correlation to be smaller in the wake of a failing regional manager versus a successful regional manager, as a failing manager will more strongly adjust subsidiary managers’ targets for past performance than a successful regional manager. The serial correlation analysis is an alternative approach to alleviate biased estimates associated with persistent shocks (Matějka et al. [2023]). If the persistent shock follows a first-order autoregressive process, running a serial correlation analysis eliminates the shock’s influence. If the time-series process is more complex, running a serial correlation analysis may at least alleviate the bias. In additional analysis, we study target setting at the regional manager’s level to characterize the regional manager’s incentives.

*Regression model 1: The association between regional manager’s target achievement and subsidiary managers’ targets.* Regression equation (1) summarizes the regression model to test how the regional manager’s target achievement in the previous period influences the extent to which subsidiary managers’ targets reflect past target achievement, as follows.

$$\frac{b_{s,t} - b_{s,t-1}}{b_{s,t-1}} = \beta_0 + \beta_1 \left( \frac{a_{s,t-1} - b_{s,t-1}}{b_{s,t-1}} \right) + \beta_2 D_{r,t-1} \times \left( \frac{a_{s,t-1} - b_{s,t-1}}{b_{s,t-1}} \right)$$

<sup>7</sup>We run a statistical analysis to document that ratios of monthly targets relative to annual targets vary (e.g., December target/annual target in year  $T$  and December target/annual target in year  $T + 1$ , results untabulated).

$$+\beta_3 d_{s,t-1} \times \left( \frac{a_{s,t-1} - b_{s,t-1}}{b_{s,t-1}} \right) + \mathbf{Control}'\gamma + \mu_r + \eta_T + \varepsilon_{s,t}, \quad (1)$$

where  $s$  indicates the subsidiary,  $r$  indicates the region, and  $t$  and  $T$  indicate the period (i.e., month and year, respectively).

**3.3.1. Dependent and Independent Variables.** The dependent variable  $\frac{b_{s,t} - b_{s,t-1}}{b_{s,t-1}}$  captures the relative change in a subsidiary manager's target from period  $t - 1$  to period  $t$ , where  $b$  represents the subsidiary manager's target. Reiterating from above, the analysis is based on monthly data. As the firm's business is seasonal, comparing two adjacent months within a year provides limited insight. Thus, to measure the change in the subsidiary manager's target, we compare the same month for two adjacent years (e.g., we compare a subsidiary manager's January 2015 target with this manager's January 2014 target). For linguistic convenience, in the following, we refer to the previous period, instead of the same month of last year. For a detailed description of the variables, please refer to the appendix.

Following Leone and Rock [2002] and Bouwens and Kroos [2011], we estimate the change in a subsidiary manager's target as a function of the subsidiary manager's target achievement, that is, the relative difference in the subsidiary manager's actual and target in period  $t - 1$ ,  $\frac{a_{s,t-1} - b_{s,t-1}}{b_{s,t-1}}$ , where  $a$  represents the subsidiary manager's actual performance. To test whether the regional manager considers her own target achievement when setting a subsidiary manager's target, we interact  $\frac{a_{s,t-1} - b_{s,t-1}}{b_{s,t-1}}$  with an indicator variable,  $D_{r,t-1}$ , which is equal to 1 if the regional manager missed her target in period  $t - 1$ , and 0 otherwise.<sup>8</sup>

To isolate the role of the regional manager's target achievement from the subsidiary manager's target achievement in explaining the change in the subsidiary manager's target, we also interact  $\frac{a_{s,t-1} - b_{s,t-1}}{b_{s,t-1}}$  with an indicator variable,  $d_{s,t-1}$ , which is equal to 1 if the *subsidiary* manager missed his target in period  $t - 1$ , and 0 otherwise. We thereby allow for an asymmetry in target ratcheting (e.g., Leone and Rock [2002]).

**3.3.2. Control Variables.** **Control** captures several control variables. We estimate the change in a subsidiary manager's target as a function of the subsidiary manager's relative target difficulty in the previous period. Aranda et al. [2014] provide evidence that supervisors consider relative target difficulty when setting targets. They find that employees with relatively easy targets, compared to their peers, experience a larger increase in targets compared to employees with relatively difficult targets. We follow Aranda et al. [2014] and construct a measure of a subsidiary manager's *ex-ante* relative target difficulty by comparing the manager's target with the peers' average

<sup>8</sup> As an alternative approach, we measure the regional manager's target achievement as a continuous variable, that is, the relative difference between the manager's actual and target in period  $t - 1$ . We find consistent evidence on our coefficient of interest when reestimating regression equation (1) while using this alternative specification (results untabulated).

performance *target*. Relying on an ex-ante measure of relative target difficulty ensures that this information is available to regional managers when setting subsidiary managers' targets.<sup>9</sup> Relative target difficulty ( $RTS_{s,t-1}$ ) is calculated as follows.

$$RTS_{s,t-1} = \frac{\frac{b_{s,t-1}}{Emp_{s,t-1}} - \frac{1}{n} \sum_{j=1}^n \frac{b_{j,t-1}}{Emp_{j,t-1}}}{\frac{1}{n} \sum_{j=1}^n \frac{b_{j,t-1}}{Emp_{j,t-1}}},$$

where  $n$  is the number of subsidiaries in the region. We scale targets by the number of employees per subsidiary,  $Emp$ , to make targets comparable. For  $RTS < 0$ , the subsidiary manager had a relatively easy target, whereas for  $RTS > 0$ , the subsidiary manager had a relatively difficult target. Adding information on relative target difficulty as control variable addresses potential moral hazard problems, reducing subsidiary manager's ability to build up slack resources (see Aranda et al. [2014], Casas-Arce et al. [2018]). Following Aranda et al. [2014], we control for the number of employees per subsidiary,  $Emp_{s,t-1}$ , and the change in the number of employees per subsidiary,  $\Delta Emp_{s,t}$ , as employees are the main input factor for production and therefore determine target levels.

To alleviate potential biases in the target-ratcheting coefficients originating in the presence of persistent shocks in subsidiary managers' performances, we add two forward-looking measures. First, we control for the change in the number of working days,  $\frac{WorkDays_{s,t} - WorkDays_{s,t-1}}{WorkDays_{s,t-1}}$ . The number of working days is an important determinant of sales. Second, we account for the regional manager's change in annual target. Given the hierarchical structure of our setting, the regional manager's target likely affects the extent to which the regional manager adjusts her subsidiary managers' targets. Thus, we control for the relative change in the regional manager's *annual* target from year  $T - 1$  to year  $T$ ,  $\frac{B_{r,T} - B_{r,T-1}}{B_{r,T-1}}$ , where  $B$  represents the regional manager's annual target. This approach is consistent with the firm's target setting, where the regional manager's *annual* target is fixed after stage 2 of the target-setting process. Given her annual target, the regional manager can revise her subsidiary managers' targets, resulting in the subsidiary managers' monthly targets after stage 3 of the target-setting process. Finally, **Control** generally includes the main effects of  $D_{r,t-1}$  and  $d_{s,t-1}$ . We include region fixed effects,  $\mu_r$ , to control for time-invariant regional characteristics (e.g., size of the region). We account for changes in economic conditions over time by including year fixed effects,  $\eta_T$ , as economic conditions may affect sales expectations and thus sales targets.

<sup>9</sup> An alternative measure of *ex-post* relative target difficulty compares a subsidiary manager's target with the peers' average *actual* performance (Aranda et al. [2014]). Casas-Arce et al. [2018] construct a measure of past peer performance that is the average performance relative to target within a given peer group in the previous period. We find consistent evidence on our coefficient of interest when reestimating regression equation (1) while using these alternative specifications (results untabulated).

We estimate regression model (1) by OLS with robust standard errors clustered at the subsidiary level. Ideally, we would cluster standard errors at the region level to account for the fact that subsidiaries cluster within regions. However, due to the small number of regions, we restrain from doing so while acknowledging that this may lead to underestimated standard errors. Consistent with H1, we expect  $\beta_2$  to be positive, suggesting that, when setting targets, a failing regional manager (relative to a successful regional manager) more strongly adjusts her subsidiary managers' targets for past performance.

*Regression models 2 and 3: The association between regional manager's target achievement and subsidiary managers' target achievement persistence.* Equations (2) and (3) present the regression models to test how a regional manager's target achievement in the previous period influences her subsidiary managers' target achievement persistence. For example, when a failing regional manager increases the target for a subsidiary manager who met his previous period target (henceforth: successful subsidiary manager), it becomes less likely for the subsidiary manager to be successful in the current period. Likewise, when a failing regional manager decreases the target for a subsidiary manager who missed his previous period target (henceforth: failing subsidiary manager), it becomes less likely for the subsidiary manager to fail in the current period. We capture the target achievement persistence via the serial correlation in subsidiary managers' target achievements:

$$d_{s,t} = \beta_0 + \beta_1 d_{s,t-1} + \beta_2 D_{r,t-1} \times d_{s,t-1} + \beta_3 D_{r,t-1} + \mathbf{Control}'\gamma + \mu_r + \eta_T + \varepsilon_{s,t}, \quad (2)$$

$$\begin{aligned} \frac{a_{s,t} - b_{s,t}}{b_{s,t}} = & \beta_0 + \beta_1 \left( \frac{a_{s,t-1} - b_{s,t-1}}{b_{s,t-1}} \right) + \beta_2 D_{r,t-1} \times \left( \frac{a_{s,t-1} - b_{s,t-1}}{b_{s,t-1}} \right) \\ & + \beta_3 d_{s,t-1} \times \left( \frac{a_{s,t-1} - b_{s,t-1}}{b_{s,t-1}} \right) + \mathbf{Control}'\gamma + \mu_r + \eta_T + \varepsilon_{s,t}, \quad (3) \end{aligned}$$

where  $s$  indicates the subsidiary,  $r$  indicates the region, and  $t$  and  $T$  indicate the period (i.e., month and year, respectively).

We apply two measures of a subsidiary manager's target achievement. In regression model (2), we use an indicator variable,  $d_{s,t}$ , which is equal to 1 if the subsidiary manager misses the target in period  $t$ , and 0 otherwise. In regression model (3), we use the relative difference between actuals and targets in period  $t$ ,  $\frac{a_{s,t} - b_{s,t}}{b_{s,t}}$ . To examine the role of the regional manager's target achievement, we interact  $d_{s,t}$  and  $\frac{a_{s,t} - b_{s,t}}{b_{s,t}}$ , respectively, with an indicator variable,  $D_{r,t-1}$ , which is equal to 1 if the regional manager missed her target in period  $t - 1$ , and 0 otherwise.

As a control variable, we add the interaction between  $\frac{a_{s,t-1} - b_{s,t-1}}{b_{s,t-1}}$  and  $d_{s,t-1}$  in regression model (3), capturing the effect of the subsidiary manager's target achievement on the persistence in the relative difference between actuals and targets. Adding this control variable helps to disentangle the effect of regional versus subsidiary managers' performances on

target achievement persistence. Further, **Control** captures relative target difficulty, capacity restrictions measured as the (change in the) number of employees, the change in the number of working days, and the relative change in regional manager's annual target, as these variables arguably affect the likelihood of target achievement. **Control** also includes the main effects of  $D_{r,t-1}$  and  $d_{s,t-1}$ . We include region fixed effects,  $\mu_r$ , and year fixed effects,  $\eta_T$ .

Regression model (2) is estimated by Logit with robust standard errors clustered at the subsidiary level. Regression model (3) is estimated by OLS with robust standard errors clustered at the subsidiary level. Consistent with H1, in regression equations (2) and (3), we expect  $\beta_1$  to be positive and  $\beta_2$  to be negative, suggesting that a subsidiary manager's target achievement persistence is smaller for a failing as compared with a successful regional manager.

### 3.4 DESCRIPTIVE STATISTICS

Table 2 summarizes the descriptive statistics on the main variables. In panel A (B), we present descriptive statistics on the monthly actual sales and sales targets at the region (subsidiary) level for the sample period, 2011 to 2016.<sup>10</sup> Actual sales are slightly decreasing over time, with an average maximum of 99,728 (16,621) units in 2012 and an average minimum of 94,141 (15,690) units in 2016 at the region (subsidiary) level, respectively. Sales targets are slightly increasing from 2011 to 2013, whereas they are decreasing from 2013 to 2016 at the region and subsidiary level. The difference between actual and targeted sales is relatively small but mostly negative, except for in 2011. In 2013, sales targets were the highest on average, and the regional (subsidiary) managers met their monthly sales targets in only 18.33% (24.17%) of the cases.

In panel C, we present the descriptive statistics on the variables used to analyze target setting at the subsidiary level. Targets are relatively constant during the sample period; that is, the mean of relative target change,  $\frac{b_{s,t} - b_{s,t-1}}{b_{s,t-1}}$ , is close to zero, whereas q25 (q75) amounts to  $-0.0530$  ( $0.0547$ ). Consistent with the descriptive statistics on actual and targeted sales, the previous period's target achievement,  $\frac{a_{s,t-1} - b_{s,t-1}}{b_{s,t-1}}$ , has a negative mean and median, indicating that—on average—subsidiary managers miss their target by 1.58%. The average likelihood of missing the target,  $d_{s,t-1}$  and  $D_{r,t-1}$ , is 55% at the subsidiary level and 54% at the region level, which is consistent with prior research (e.g., Indjejikian et al. [2014a], Holzhacker et al. [2019]).

<sup>10</sup>The division under study offers two types of services, which are bundled in more than 80% of cases. After consulting with the firm's management, we do not differentiate between the two types of services but aggregate the sales data from the two services and include total monthly sales in the analysis.



**TABLE 2**  
*Descriptive Statistics*

Panel A: Actual sales and sales targets at the region level						
Years	#Obs. $A_{i,t}$	#Obs. $B_{i,t}$	Average $A_{i,t}$	Average $B_{i,t}$	$A_{i,t} - B_{i,t}$	$\% (A_{i,t} - B_{i,t}) \geq 0$
2011	60	60	98,904	98,160	743	43.33
2012	60	60	99,728	99,877	-149	53.33
2013	60	60	95,554	101,419	-5,865	18.33
2014	60	60	95,551	100,222	-4,671	56.67
2015	60	60	95,478	96,363	-885	46.67
2016	60	60	94,141	95,117	-975	46.67
Total / Average	360	360	96,559	98,526	-1,967	44.17
Panel B: Actual sales and sales targets at the subsidiary level						
Years	#Obs. $a_{i,t}$	#Obs. $b_{i,t}$	Average $a_{i,t}$	Average $b_{i,t}$	$a_{i,t} - b_{i,t}$	$\% (a_{i,t} - b_{i,t}) \geq 0$
2011	360	360	16,484	16,360	124	48.89
2012	360	360	16,621	16,646	-25	52.78
2013	360	360	15,926	16,903	-978	24.17
2014	360	360	15,925	16,704	-779	46.94
2015	360	360	15,913	16,061	-148	47.22
2016	360	360	15,690	15,853	-163	46.94
Total / Average	2,160	2,160	16,093	16,421	-328	44.49

(Continued)

TABLE 2—(Continued)

Variable	#Obs.	Mean	Std.Dev.	q25	q50	q75
$\frac{b_{s,t} - b_{s,t-1}}{b_{s,t-1} - b_{s,t-2}}$	2,160	0.0028	0.0945	-0.0530	0.0047	0.0547
$\frac{a_{s,t-1} - b_{s,t-1}}{b_{s,t-1}}$	2,160	-0.0158	0.0913	-0.0746	-0.0117	0.0428
$d_{s,t-1}$	2,160	0.55	0.50	0	1	1
$D_{r,t-1}$	2,160	0.54	0.50	0	1	1
$RTS_{s,t-1}$	2,160	0.0000	0.0919	-0.0531	-0.0113	0.0406
$Em\beta_{s,t-1}$	2,160	103	26	82	97	122
$\Delta Em\beta_{s,t}$	2,160	-0.0052	0.0371	-0.0276	0.0000	0.0186
$\Delta WorkDays_{s,t}$	2,160	0.00	0.06	-0.05	0.00	0.05
$\frac{b_{s,t} - b_{s,t-1}}{b_{s,t-1}}$	2,160	-0.0006	0.0240	-0.0197	-0.0016	0.0219

This table presents the descriptive statistics on our main variables. Panel A (B) reports on the descriptive statistics on actual sales and sales targets at the region (subsidiary) level. Panel C reports on the descriptive statistics on target setting at the subsidiary level.  $r$  indicates the region,  $s$  indicates the subsidiary, and  $t$  and  $T$  indicate the period (i.e., month and year). Variable definitions:

$A_{r,t}$  = actual sales per region  $r$  in period  $t$ ;  $B_{r,t}$  = sales targets per region  $r$  in period  $t$ ;  $t\%(A_{r,t} - B_{r,t}) \geq 0$  = percentage of regions  $r$  where actual sales are greater than sales targets in period  $t$ ;  $a_{s,t}$  = actual sales per subsidiary  $s$  in period  $t$ ;  $b_{s,t}$  = sales targets per subsidiary  $s$  in period  $t$ ;  $t\%(a_{s,t} - b_{s,t}) \geq 0$  = percentage of subsidiaries  $s$  where actual sales are greater than sales targets in period  $t$ ;  $d_{s,t-1} = 1$  if  $a_{s,t-1} < b_{s,t-1}$ , 0 otherwise;  $D_{r,t-1} = 1$  if  $A_{r,t-1} < B_{r,t-1}$ , 0 otherwise;  $RTS_{s,t-1}$  = relative target difficulty at subsidiary  $s$  in period  $t-1$ , defined as

$$RTS_{s,t-1} = \frac{b_{s,t-1} - \frac{1}{n} \sum_{j=1}^n b_{j,t-1}}{Em\beta_{s,t-1}}$$

where  $n$  is the number of subsidiaries in the region where a subsidiary is located;

$Em\beta_{s,t-1}$  = number of employees per subsidiary  $s$  in period  $t-1$ ;

$\Delta Em\beta_{s,t}$  = relative change in the number of employees per subsidiary  $s$  from period  $t-1$  to period  $t$ , that is,  $\frac{Em\beta_{s,t} - Em\beta_{s,t-1}}{Em\beta_{s,t-1}}$ ; and

$\Delta WorkDays_{s,t}$  = relative change in the number of working days at subsidiary  $s$  location from period  $t-1$  to period  $t$ , i.e.,  $\frac{WorkDays_{s,t} - WorkDays_{s,t-1}}{WorkDays_{s,t-1}}$ .

### 3.5 CORRELATIONS

Table 3 summarizes the Pearson correlations among the main variables. We find a positive and statistically significant ( $p < 0.01$ ) association between  $\frac{a_{s,t-1} - b_{s,t-1}}{b_{s,t-1}}$  and  $\frac{b_{s,t} - b_{s,t-1}}{b_{s,t-1}}$ , suggesting the presence of target ratcheting. Consistent with Aranda et al. [2014], there is a negative and statistically significant ( $p < 0.10$ ) association between  $RTS_{s,t-1}$  and  $\frac{b_{s,t} - b_{s,t-1}}{b_{s,t-1}}$ , suggesting that regional managers consider relative target difficulty in target setting. We also note that there is a positive and statistically significant ( $p < 0.01$ ) association between  $D_{r,t-1}$  and  $d_{s,t-1}$ , suggesting that regional and subsidiary managers' target achievements are interrelated. However, the correlation is sufficiently low such that both variables can be included in the regression analysis without running into multicollinearity issues.

## 4. Results

### 4.1 HOW IS REGIONAL MANAGER'S TARGET ACHIEVEMENT ASSOCIATED WITH SUBSIDIARY MANAGERS' TARGETS?

To test H1, we first examine the question of how the regional manager's target achievement is associated with her subsidiary managers' targets (regression equation (1)). In panels A and B of table 4, we report descriptive evidence. In panel C, we present the results of the multiple regression analysis.

In the descriptive statistics presented in panels A and B, we examine how a regional manager adjusts her subsidiary managers' targets depending on regional and subsidiary managers' target achievements. Since the target setting likely depends on the extent to which headquarters adjusts the regional manager's target, which is driven by headquarters' own target achievement, we differentiate two cases: Headquarters met its target in the previous period (panel A) and headquarters missed its target in the previous period (panel B).

For successful subsidiary managers, we find that a failing regional manager more strongly increases subsidiary managers' targets as compared to a successful regional manager. In case headquarters met its target, on average, a failing regional manager increases targets by 8%, whereas a successful regional manager increases targets by only 5%. The difference is statistically significant ( $p < 0.01$ ). In case headquarters missed its target, we find consistent results. On average, a failing regional manager increases targets by 2%, whereas a successful regional manager keeps targets constant. The difference is statistically significant ( $p < 0.01$ ). These findings are consistent with H1. For failing subsidiary managers, we find no statistically significant difference in target adjustment between a failing and a successful regional manager. On average, in case headquarters met its target, a regional manager increases targets by 3% and in case headquarters missed its target, a regional manager decreases targets by more than 3%.

TABLE 3  
Correlations

Variable	$\frac{a_{s,t-1}-b_{s,t-1}}{b_{s,t-1}}$	$\frac{a_{s,t-1}-b_{s,t-1}}{b_{s,t-1}}$	$d_{s,t-1}$	$D_{s,t-1}$	$RTS_{s,t-1}$	$Emp_{s,t-1}$	$\Delta Emp_{s,t}$	$\Delta WorkDays_{s,t}$
$\frac{a_{s,t-1}-b_{s,t-1}}{b_{s,t-1}}$	0.48***							
$d_{s,t-1}$	-0.37***	-0.78***						
$D_{s,t-1}$	-0.33***	-0.68***	0.68***					
$RTS_{s,t-1}$	-0.04*	0.01	-0.02	-0.00				
$Emp_{s,t-1}$	-0.02	-0.08***	0.09***	0.01	-0.47***			
$\Delta Emp_{s,t}$	-0.02	0.03	-0.04**	-0.01	0.30***	-0.17***		
$\Delta WorkDays_{s,t}$	0.30***	-0.10***	0.06***	0.10***	-0.00	-0.00	-0.05**	
$\frac{b_{s,t}-b_{s,t-1}}{b_{s,t-1}}$	0.23***	0.13***	-0.08***	-0.02	-0.00	0.03	0.11***	-0.07***

This table presents the Pearson correlation coefficients on our main variables.

\*\*\*  $p < 0.01$ ,

\*\*  $p < 0.05$ ,

\*  $p < 0.1$ .

$r$  indicates the region,  $s$  indicates the subsidiary, and  $t$  and  $T$  indicate the period (i.e., month and year). Variable definitions:  $b_{s,t}$  = sales targets per subsidiary  $s$  in period  $t$ ;  $a_{s,t-1}$  = actual sales per subsidiary  $s$  in period  $t-1$ ;  $d_{s,t-1} = 1$  if  $a_{s,t-1} < b_{s,t-1}$ , 0 otherwise;  $D_{s,t-1} = 1$  if  $A_{s,t-1} < B_{s,t-1}$ , 0 otherwise;  $RTS_{s,t-1}$  = relative target difficulty at subsidiary  $s$  in period  $t-1$ , defined as

$$RTS_{s,t-1} = \frac{\frac{b_{s,t-1}-1}{\sum_{j=1}^{b_{s,t-1}} Emp_{j,t-1}} - \frac{1}{n} \sum_{j=1}^{b_{s,t-1}} \frac{b_{j,t-1}}{Emp_{j,t-1}}}{\frac{b_{s,t-1}-1}{\sum_{j=1}^{b_{s,t-1}} Emp_{j,t-1}}}$$

where  $n$  is the number of subsidiaries in the region where a subsidiary is located;  $Emp_{s,t-1}$  = number of employees per subsidiary  $s$  in period

$t-1$ ;  $\Delta Emp_{s,t}$  = relative change in the number of employees per subsidiary  $s$  from period  $t-1$  to period  $t$ , i.e.,  $\frac{Emp_{s,t}-Emp_{s,t-1}}{Emp_{s,t-1}}$ ;  $\Delta WorkDays_{s,t}$  = relative change in the number of working

days at subsidiary's  $s$  location from period  $t-1$  to period  $t$ , i.e.,  $\frac{WorkDays_{s,t}-WorkDays_{s,t-1}}{WorkDays_{s,t-1}}$ ; and

$B_{s,t}$  = sales target per region  $r$  in year  $T$ .

**TABLE 4**  
*Regional Manager's Target Achievement and Subsidiary Managers' Targets*

Panel A: Descriptives (HQ target met)						
	$\frac{b_{s,t} - b_{s,t-1}}{b_{s,t-1}}$		Successful Regional Manager ( $D_{r,t-1} = 0$ )	Failing Regional Manager ( $D_{r,t-1} = 1$ )	Diff (sign.)	
Successful Subsidiary Manager ( $d_{s,t-1} = 0$ )			0.05 (n = 717)	0.08 (n = 61)	0.04***	
Failing Subsidiary Manager ( $d_{s,t-1} = 1$ )			0.03 (n = 147)	0.03 (n = 95)	0.00	
Panel B: Descriptives (HQ target missed)						
	$\frac{b_{s,t} - b_{s,t-1}}{b_{s,t-1}}$		Successful Regional Manager ( $D_{r,t-1} = 0$ )	Failing Regional Manager ( $D_{r,t-1} = 1$ )	Diff (sign.)	
Successful Subsidiary Manager ( $d_{s,t-1} = 0$ )			-0.00 (n = 89)	0.02 (n = 99)	0.03***	
Failing Subsidiary Manager ( $d_{s,t-1} = 1$ )			-0.03 (n = 39)	-0.04 (n = 913)	-0.01	
Panel C: Multiple regression models						
	All Observations		Successful Regional Manager ( $D_{r,t-1} = 0$ )		Failing Regional Manager ( $D_{r,t-1} = 1$ )	
	(1a)	(1b)	(2a)	(2b)	(3a)	(3b)
Variables	$\frac{b_{s,t} - b_{s,t-1}}{b_{s,t-1}}$	$\frac{b_{s,t} - b_{s,t-1}}{b_{s,t-1}}$	$\frac{b_{s,t} - b_{s,t-1}}{b_{s,t-1}}$	$\frac{b_{s,t} - b_{s,t-1}}{b_{s,t-1}}$	$\frac{b_{s,t} - b_{s,t-1}}{b_{s,t-1}}$	$\frac{b_{s,t} - b_{s,t-1}}{b_{s,t-1}}$
$\frac{a_{s,t-1} - b_{s,t-1}}{b_{s,t-1}}$	0.450*** (0.025)	0.455*** (0.026)	0.242*** (0.034)	0.197*** (0.037)	0.651*** (0.031)	0.655*** (0.037)
$D_{r,t-1} \times \left( \frac{a_{s,t-1} - b_{s,t-1}}{b_{s,t-1}} \right)$	0.596*** (0.155)	0.462*** (0.144)				
$d_{s,t-1} \times \left( \frac{a_{s,t-1} - b_{s,t-1}}{b_{s,t-1}} \right)$	-0.239 (0.191)	0.007 (0.165)				
$RTS_{s,t-1}$	-0.041*** (0.013)	-0.044*** (0.015)	-0.032** (0.013)	-0.041* (0.022)	-0.049** (0.021)	-0.048** (0.021)
$D_{r,t-1}$	-0.011** (0.005)	-0.019*** (0.006)				
$d_{s,t-1}$	0.000 (0.006)	0.001 (0.006)		-0.000 (0.006)		-0.000 (0.007)
$Emp_{s,t-1}$		-0.000 (0.000)		-0.000 (0.000)		-0.000 (0.000)
$\Delta Emp_{s,t}$		-0.059 (0.058)		-0.064 (0.073)		-0.042 (0.076)

(Continued)

TABLE 4—(Continued)

Panel C: Multiple regression models

	All Observations		Successful Regional Manager ( $D_{r,t-1} = 0$ )		Failing Regional Manager ( $D_{r,t-1} = 1$ )	
	(1a)	(1b)	(2a)	(2b)	(3a)	(3b)
$\Delta WorkDays_{s,t}$		0.615*** (0.017)		0.763*** (0.026)		0.522*** (0.020)
$\frac{B_{r,T} - B_{r,T-1}}{B_{r,T-1}}$		0.732** (0.126)		0.956*** (0.308)		0.767*** (0.136)
Region FE	No	Yes	No	Yes	No	Yes
Year FE	No	Yes	No	Yes	No	Yes
Constant	0.013*** (0.003)	0.018* (0.009)	0.024*** (0.002)	0.077*** (0.013)	0.022*** (0.003)	0.023 (0.017)
Observations	2,160	2,160	992	992	1,168	1,168
Ftest ( $\beta_1 + \beta_2 + \beta_3 = 0$ )		156.20***				
Adjusted R-squared	0.249	0.417	0.038	0.388	0.215	0.337
F-statistic	147.65***	224.09***	30.16***	131.27***	243.93***	244.14***

This table reports on the association between regional manager’s target achievement and subsidiary managers’ targets. Panel A (B) presents the mean of relative target changes at the subsidiary level differentiating between whether the subsidiary manager and regional manager met or missed their targets in case headquarters met (missed) its target. We report the number of observations in brackets. Panel C presents the multiple regression models, where we regress the change in targets from period  $t - 1$  to  $t$  on the target achievement at period  $t - 1$ . In columns 1a and 1b, we present the results on the full sample. In columns 2a to 3b, we split the sample based on whether the regional manager met (columns 2a and 2b) or missed (columns 3a and 3b) her target in the previous period. In columns 1a, 2a, and 3a, we present the results without control variables. In columns 1b, 2b, and 3b, we present the results of the full models. The analysis is based on monthly data of 30 subsidiaries for the time period 2011 to 2016.  $s$  indicates the subsidiary,  $r$  indicates the region, and  $t$  and  $T$  indicate the period (i.e., month and year). We mean-center the variables used in the interaction term. All regression models are estimated by OLS. Robust standard errors clustered at the subsidiary level are reported in parentheses.

\*\*\*  $p < 0.01$ ,

\*\*  $p < 0.05$ ,

\*  $p < 0.1$ .

Variable definitions:

$b_{s,t}$  = sales targets per subsidiary  $s$  in period  $t$ ;

$a_{s,t-1} = 1$  if  $a_{s,t-1} < b_{s,t-1}$ , 0 otherwise;  $D_{r,t-1} = 1$  if  $A_{r,t-1} < B_{r,t-1}$ , 0 otherwise;  $a_{s,t-1}$  = actual sales per subsidiary  $s$  in period  $t-1$ ;  $RTS_{s,t-1}$  = relative target difficulty at subsidiary  $s$  in period  $t-1$ , defined as

$$RTS_{s,t-1} = \frac{\frac{b_{s,t-1}}{Emp_{s,t-1}} - \frac{1}{n} \sum_{j=1}^n \frac{b_{j,t-1}}{Emp_{j,t-1}}}{\frac{1}{n} \sum_{j=1}^n \frac{b_{j,t-1}}{Emp_{j,t-1}}}$$

where  $n$  is the number of subsidiaries in the region where a subsidiary is located;  $Emp_{s,t-1}$  = number of employees per subsidiary  $s$  in period  $t-1$ ;  $\Delta Emp_{s,t}$  = relative change in the number of employees per subsidiary  $s$  from period  $t-1$  to period  $t$ , i.e.,  $\frac{Emp_{s,t} - Emp_{s,t-1}}{Emp_{s,t-1}}$ ;  $\Delta WorkDays_{s,t}$  = relative change in the number of working days at subsidiary’s  $s$  location from period  $t-1$  to period  $t$ , i.e.,  $\frac{WorkDays_{s,t} - WorkDays_{s,t-1}}{WorkDays_{s,t-1}}$ ; and  $B_{r,T}$  = sales target per region  $r$  in year  $T$ .

The descriptive statistics indicate that a regional manager’s past performance is associated with the extent to which the regional manager incorporates information on her subsidiary managers’ past performance in target setting. Moreover, the target adjustments in panels A and B suggest that headquarters reduces regional managers’ targets in case headquarters missed its target (which is likely explained by multiple failing regional

managers), arguably to reduce regional managers' performance pressure. This decline in performance pressure translates into lower adjustments of subsidiary managers' targets.

Next, we examine H1 using a multiple regression analysis (regression model (1)). We present the results in panel C of table 4. In columns 1a and 1b, we run regression model (1) using the full sample. As robustness check, in columns 2a to 3b, we run subsample analyses based on the regional managers' target achievements ( $D_{r,t-1} = 0$  vs.  $D_{r,t-1} = 1$ ). We find that targets increase (decrease) for successful (failing) subsidiary managers ( $p < 0.01$ ), which is consistent with target ratcheting. More importantly, the interaction term  $D_{r,t-1} \times (\frac{a_{s,t-1} - b_{s,t-1}}{b_{s,t-1}})$  is positive and statistically significant in columns 1a and 1b (e.g., COEFF = 0.462;  $p < 0.01$ ; column 1b), suggesting that a failing regional manager more strongly adjusts subsidiary managers' targets for subsidiary managers' past performance, relative to a successful regional manager.

Regarding the controls, we do not find a statistically significant coefficient on the interaction term  $d_{s,t-1} \times (\frac{a_{s,t-1} - b_{s,t-1}}{b_{s,t-1}})$ , suggesting that the regional manager does not apply asymmetric target ratcheting. Consistent with Aranda et al. [2014], we find a negative and statistically significant coefficient on  $RTS_{s,t-1}$  ( $p < 0.01$  in columns 1a and 1b), suggesting that targets increase less when subsidiary managers had a relatively difficult target. Consistent with the evidence from the descriptive statistics, we find a statistically significant coefficient on  $\frac{B_{r,T} - B_{r,T-1}}{B_{r,T-1}}$  (COEFF = 0.732;  $p < 0.01$ ; column 1b), suggesting a positive association between a regional manager's annual target adjustment and her subsidiary managers' target adjustments.

When we split the sample for successful and failing regional managers, the results are consistent. A failing regional manager more strongly adjusts the subsidiary managers' targets using the subsidiary managers' target achievements than a successful regional manager (COEFF = 0.655 in column 3b vs. COEFF = 0.197 in column 2b). The difference in the coefficients on  $\frac{a_{s,t-1} - b_{s,t-1}}{b_{s,t-1}}$  between the two subsamples is statistically significant ( $p < 0.01$ ).

We perform several robustness checks to test the validity of our findings. First, we address the fact that subsidiary and regional managers' explicit incentives relate to their *annual* performance. We find consistent evidence on our coefficient of interest when reestimating regression model (1) while additionally controlling for whether subsidiary managers met their annual target in the previous year. We also replicate the analysis in table 4, panel C, while measuring subsidiary and regional managers' past performance at the annual level. Specifically, we capture the regional manager's past performance by an indicator variable,  $D_{r,T-1}$ , which is equal to 1 if the regional manager missed her annual target in the last year, and 0 otherwise. Similarly, we capture the subsidiary manager's past performance by an indicator variable,  $d_{s,T-1}$ , which is equal to 1 if the subsidiary manager missed his annual target in the last year, and 0 otherwise. We find

consistent evidence on our coefficient of interest when reestimating regression model (1) while using these alternative measures to capture subsidiary and regional managers' past performance.

Second, we find consistent evidence on our coefficient of interest when we exclude data for the year 2013, which seems to be an outlier in terms of performance (see table 2). Third, we consider whether a failing regional manager adjusts a subsidiary manager's target differently depending on the subsidiary manager's success or failure. The coefficient on an additional three-way interaction in regression model (1),  $D_{r,t-1} \times d_{s,t-1} \times \left( \frac{a_{s,t-1} - b_{s,t-1}}{b_{s,t-1}} \right)$ , is positive but statistically insignificant, suggesting that a failing regional manager does not differentiate between successful and failing subsidiary managers and uses their target achievements similarly to adjust the targets. The results of these robustness checks are not tabulated in the paper.<sup>11</sup>

Using the regression results presented in table 4 (panel C, column 1b), figure 1 presents the effect of the regional manager's success or failure on the association between a subsidiary manager's target achievement and the change in the subsidiary manager's target. We differentiate four cases: (1) successful subsidiary and regional managers, (2) failing subsidiary manager and successful regional manager, (3) successful subsidiary manager and failing regional manager, and (4) failing subsidiary and regional managers. The target-setting pattern depicted in figure 1 shows that the subsidiary manager's target adjustment is more sensitive to the subsidiary manager's target achievement for a failing regional manager than for a successful regional manager.

Overall, the results in table 4 and figure 1 support H1 that a failing middle manager who missed her target in the previous period more strongly adjusts the agent's target for the agent's past performance than a successful middle manager.

#### 4.2 HOW IS REGIONAL MANAGER'S TARGET ACHIEVEMENT ASSOCIATED WITH SUBSIDIARY MANAGERS' TARGET ACHIEVEMENT PERSISTENCE?

Continuing our tests of H1, we examine whether a regional manager's target achievement is associated with her subsidiary managers' target achievement persistence. We analyze the serial correlation in subsidiary

<sup>11</sup> As a further robustness check, we analyze how a regional manager allocates her target across the region's subsidiary managers depending on her own target achievement. We examine how the change in the proportion of a subsidiary manager's target relative to his regional manager's target depends on the regional manager's target achievement. This analysis accounts for the fact that a regional manager's target setting is a zero-sum game, that is, within a region, the subsidiary managers' targets sum up to the regional manager's target. By controlling for the change in the regional manager's annual target, the analysis explicitly accounts for the hierarchical structure of the setting. Consistent with the main results, our findings suggest that a regional manager adjusts her target allocations for successful and failing subsidiary managers depending on her own target achievement. Specifically, for a failing regional manager, we find that successful subsidiary managers must carry more and failing subsidiary managers must carry less of the regional manager's target in the next period (results untabulated).



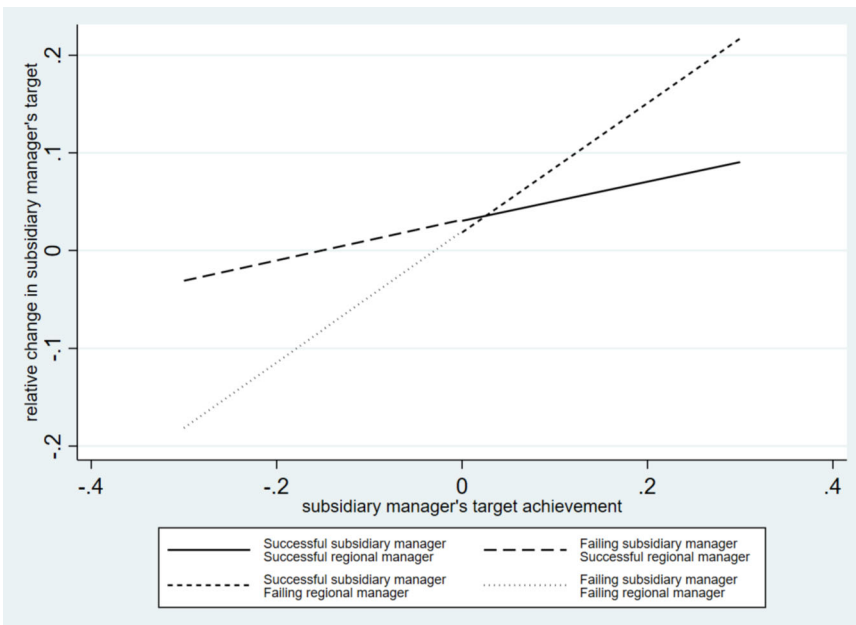


FIG. 1.—Association between subsidiary managers’ target achievement and their change in targets. This figure illustrates the marginal effects of the subsidiary manager’s target achievement in the previous period on the subsidiary managers’ relative change in targets based on the regression results presented in table 4, panel C, column 1b. We present four cases: (1) successful subsidiary and regional managers, (2) a failing subsidiary manager and a successful regional manager, (3) a successful subsidiary manager and a failing regional manager, and (4) failing subsidiary and regional managers.

managers’ target achievements, depending on the regional manager’s target achievement. We present the results of regression model (2) in panel A of table 5. In column 1, we use the full sample. In columns 2 and 3, we split the sample based on whether the regional manager met or missed the target in the previous period.

In panel A, we find a positive and statistically significant coefficient on  $d_{s,t-1}$  (COEFF = 1.131;  $p < 0.01$ ; column 1). This result provides support for a serial correlation in subsidiary managers’ target achievements across periods, suggesting that a failing (successful) subsidiary manager is likely to miss (meet) his target in the current period as well. We also find a positive and statistically significant ( $p < 0.01$ ) coefficient on  $D_{r,t-1}$ , suggesting that a regional manager’s target achievement is associated with her subsidiary managers’ target achievements. Consistent with H1, we find a negative and statistically significant coefficient on the interaction term  $D_{r,t-1} \times d_{s,t-1}$  (COEFF =  $-0.930$ ;  $p < 0.01$ ; column 1). To interpret this coefficient in terms of sign and significance, we follow Norton et al. [2004] and

determine the cross-partial derivative.<sup>12</sup> We find a negative mean interaction effect (−0.21) and a small variation (between −0.23 and −0.07). The interaction effect is statistically significant at all levels. This finding indicates that the serial correlation in subsidiary managers’ target achievements is lower for a failing regional manager than for a successful regional manager, suggesting that a failing regional manager more strongly adjusts subsidiary managers’ targets for past performance than a successful regional manager.

When analyzing the subsample with successful regional managers in column 2, we find a positive and statistically significant coefficient on  $d_{s,t-1}$  (COEFF = 1.162;  $p < 0.01$ ), suggesting that subsidiary managers’ target achievements persist over time. For the subsample of failing regional managers in column 3,  $d_{s,t-1}$  is positive but not significant (COEFF = 0.238;  $p > 0.10$ ), suggesting that subsidiary managers’ target achievements are unrelated across periods. This is consistent with a failing regional manager more strongly incorporating her subsidiary managers’ past performance in next period’s targets compared with a successful regional manager. We find largely consistent evidence on our coefficient of interest when we capture the regional managers’ past performance relative to target at the annual rather than the monthly level (results untabulated).

In panel B of table 5, we examine the association between a regional manager’s target achievement and her subsidiary managers’ target achievement persistence by analyzing the serial correlation in the *extent* of target achievement,  $\frac{a_{s,t}-b_{s,t}}{b_{s,t}}$ , for the current and the previous period (i.e., regression model (3)). In column 1, we present the results on the serial correlation in subsidiary managers’ target achievements without the interaction terms. In column 2, we add the interaction term at the region level. In column 3, we add the interaction term at the subsidiary level. In column 4, we add both interaction terms and run the full model.

Consistent with the results presented in panel A of table 5, in all columns we find a positive and statistically significant ( $p < 0.01$ ) coefficient on  $\frac{a_{s,t-1}-b_{s,t-1}}{b_{s,t-1}}$ , indicating a serial correlation in subsidiary managers’ target achievements across periods. Consistent with H1, we find a negative and statistically significant coefficient on the interaction  $D_{r,t-1} \times (\frac{a_{s,t-1}-b_{s,t-1}}{b_{s,t-1}})$  (COEFF = −0.413;  $p < 0.01$ ; column 4). This finding indicates that the serial correlation in subsidiary managers’ target achievements is smaller for a failing regional manager than for a successful regional manager. We also find a negative and statistically significant coefficient on the interaction  $d_{s,t-1} \times (\frac{a_{s,t-1}-b_{s,t-1}}{b_{s,t-1}})$  (COEFF = −0.461;  $p < 0.01$ ; column 3). However, the association disappears when we run the full model in column 4, suggesting that regional managers’ target achievements are the major driver for subsidiary managers’ target achievement persistence. We find consistent evidence on our coefficient of interest when we capture the regional and

<sup>12</sup> Specifically, we use the Stata command *inteff*, which computes the marginal effect of a change in two interacted variables for a logit model (Norton et al. [2004]).

**TABLE 5**  
*Regional Manager's Target Achievement and Subsidiary Managers' Target Achievement Persistence*

Panel A: Indicator variable to capture subsidiary managers' target achievement

	All Observations	Successful Regional Manager ( $D_{r,t-1} = 0$ )	Failing Regional Manager ( $D_{r,t-1} = 1$ )
	(1)	(2)	(3)
Variables	$d_{s,t}$	$d_{s,t}$	$d_{s,t}$
$d_{s,t-1}$	1.131*** (0.193)	1.162*** (0.205)	0.238 (0.171)
$D_{r,t-1} \times d_{s,t-1}$	-0.930*** (0.219)		
$D_{r,t-1}$	0.642*** (0.154)		
$RTS_{s,t-1}$	0.501 (0.513)	0.847 (0.650)	0.274 (0.698)
$Emp_{s,t-1}$	0.011*** (0.002)	0.013*** (0.003)	0.010*** (0.003)
$\Delta Emp_{s,t}$	-2.652** (1.105)	-4.314* (2.331)	-1.492 (1.187)
$\Delta WorkDays_{s,t}$	2.152*** (0.603)	6.760*** (1.150)	0.047 (0.906)
$\frac{B_{r,T} - B_{r,T-1}}{B_{r,T-1}}$	13.585*** (5.214)	17.579** (8.064)	11.782 (8.172)
Region FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Constant	-0.597* (0.355)	-1.070* (0.598)	0.315 (0.360)
Observations	2,160	992	1,168
Pseudo R-squared	0.077	0.135	0.036
Wald chi2	591.21***	383.91***	197.22***

Panel B: Continuous variable to capture subsidiary managers' target achievement

	(1)	(2)	(3)	(4)
Variables	$\frac{a_{s,t} - b_{s,t}}{b_{s,t}}$	$\frac{a_{s,t} - b_{s,t}}{b_{s,t}}$	$\frac{a_{s,t} - b_{s,t}}{b_{s,t}}$	$\frac{a_{s,t} - b_{s,t}}{b_{s,t}}$
$\frac{a_{s,t-1} - b_{s,t-1}}{b_{s,t-1}}$	0.235*** (0.038)	0.274*** (0.035)	0.264*** (0.036)	0.274*** (0.036)
$D_{r,t-1} \times$ $(\frac{a_{s,t-1} - b_{s,t-1}}{b_{s,t-1}})$		-0.431*** (0.042)		-0.413*** (0.117)
$d_{s,t-1} \times$ $(\frac{a_{s,t-1} - b_{s,t-1}}{b_{s,t-1}})$			-0.461*** (0.058)	-0.024 (0.153)
$d_{s,t-1}$	-0.007 (0.006)	-0.002 (0.005)	0.005 (0.005)	-0.002 (0.006)
$D_{r,t-1}$	0.007 (0.004)	0.014*** (0.004)	0.007 (0.004)	0.013*** (0.005)
$RTS_{s,t-1}$	0.005 (0.016)	0.008 (0.018)	0.010 (0.017)	0.008 (0.018)
$Emp_{s,t-1}$	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)

(Continued)

TABLE 5—(Continued)

Panel B: Continuous variable to capture subsidiary managers' target achievement				
	(1)	(2)	(3)	(4)
$\Delta Emp_{s,t}$	0.165*** (0.044)	0.158*** (0.043)	0.160*** (0.044)	0.158*** (0.043)
$\Delta WorkDays_{s,t}$	-0.072*** (0.016)	-0.076*** (0.016)	-0.081*** (0.017)	-0.076*** (0.017)
$\frac{B_{r,T}-B_{r,T-1}}{B_{r,T-1}}$	-0.812*** (0.267)	-0.776*** (0.265)	-0.795*** (0.263)	-0.777*** (0.266)
Region FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Constant	-0.013 (0.011)	-0.022 (0.013)	-0.031** (0.013)	-0.024* (0.013)
Observations	2,160	2,160	2,160	2,160
Adjusted R-squared	0.143	0.167	0.162	0.166
F-statistic	42.40***	63.80***	61.89***	66.60***

This table presents the results on the analysis of the association between regional manager's target achievement and subsidiary managers' target achievement persistence. Panel A reports the results on the association using an indicator variable to capture subsidiary managers' target achievement persistence. In column 1, we present the results on the full sample. In column 2, we only use those observations where the regional managers met their targets. In column 3, we only use those observations where the regional managers missed their targets. Panel B reports the results on the association using a continuous variable to capture subsidiary managers' target achievement persistence. In column 1, we do not account for differences in serial correlation depending on target achievement by the regional or subsidiary manager. In column 2, we account for differences in serial correlation depending on target achievement by the regional manager. In column 3, we account for differences in serial correlation depending on target achievement by the subsidiary manager. In column 4, we account for differences in serial correlation depending on target achievement by the regional and subsidiary manager. The analysis is based on monthly data of 30 subsidiaries for the time period 2011 to 2016. *r* indicates the region, *s* indicates the subsidiary, and *t* and *T* indicate the period (i.e., month and year). We mean-center the variables used in the interaction terms in panel B. The regression models in panel A are estimated by Logit; the regression models in panel B are estimated by OLS. Robust standard errors clustered at the subsidiary level are reported in parentheses.

\*\*\*  $p < 0.01$ ,

\*\*  $p < 0.05$ ,

\*  $p < 0.1$ .

Variable definitions:

$d_{s,t} = 1$  if  $a_{s,t} < b_{s,t}$ , 0 otherwise;

$D_{r,t-1} = 1$  if  $A_{r,t-1} < B_{r,t-1}$ , 0 otherwise;  $a_{s,t}$  = actual sales per subsidiary *s* in period *t*;  $b_{s,t}$  = sales targets per subsidiary *s* in period *t*;

$RTS_{s,t-1}$  = relative target difficulty at subsidiary *s* in period *t*, defined as

$$RTS_{s,t-1} = \frac{\frac{b_{s,t-1}}{Emp_{s,t-1}} - \frac{1}{n} \sum_{j=1}^n \frac{b_{j,t-1}}{Emp_{j,t-1}}}{\frac{1}{n} \sum_{j=1}^n \frac{b_{j,t-1}}{Emp_{j,t-1}}}$$

where *n* is the number of subsidiaries in the region where a subsidiary is located;  $Emp_{s,t-1}$  = number of employees per subsidiary *s* in period *t*-1;

$\Delta Emp_{s,t}$  = relative change in the number of employees per subsidiary *s* from period *t*-1 to period *t*, i.e.,  $\frac{Emp_{s,t} - Emp_{s,t-1}}{Emp_{s,t-1}}$ ;  $\Delta WorkDays_{s,t}$  = relative change in the number of working days at subsidiary's *s* location

from period *t*-1 to period *t*, i.e.,  $\frac{WorkDays_{s,t} - WorkDays_{s,t-1}}{WorkDays_{s,t-1}}$ ; and

$B_{r,T}$  = sales target per region *r* in year *T*.

subsidiary managers' past performance relative to target at the annual rather than the monthly level (results untabulated). Overall, the results suggest that a failing middle manager who missed her target in the previous period more strongly adjusts the agent's target for the agent's past

performance compared with a successful middle manager, providing further support for H1.

## 5. *Additional Analysis*

### 5.1 INTERVIEW-BASED EVIDENCE

In this subsection, we present qualitative evidence to corroborate the archival-based empirical findings. To this end, we conducted semistructured interviews with management at headquarters and three regional managers.<sup>13</sup>

The following statements by regional managers relate to the well-understood practice of (asymmetric) target ratcheting and confirm that regional managers adjust subsidiary managers' targets for past performance. When updating targets, regional managers aim to identify reasons that led subsidiary managers to deviate from their targets, ultimately differentiating between transitory versus permanent performance changes and self-caused versus external effects. Consistent with the ratchet effect, regional managers do not fully adjust subsidiary managers' targets for past performance as this would incite gaming, suggesting that target achievements are partly persistent.

In order to judge fairly I need to know where someone is coming from, is he better or worse than the previous year and has he achieved his target. Otherwise, he will always try to push for low targets, which he then always exceeds. Thus, he is always the hero.

Of course, this is research into the causes: Has a major customer dropped out? Or do we have [...] a double sickness rate? The point is [...] to identify the reason. In the worst case, it's stupidity, or laziness, or incompetence. I mean then you have an issue.

You exceeded [your target] this year [by] 20%, next year [I'll raise your target] again [by] 20% that's unrealistic, sorry. I've always said if any member of the top management team wants something like that - well, keep dreaming. But I had experienced something like that once in my professional life and learned from it. I'd rather take a strong beating once than a beating every month.

Consistent with this study's theoretical arguments and archival evidence, the following statements by regional managers highlight the key tradeoff faced by regional managers. On the one hand, regional managers try to establish a long-term relationship with their subsidiary managers by rewarding successful subsidiary managers through setting achievable future tar-

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<sup>13</sup> The interviews were conducted in German. We have translated the statements from German into English.

gets and by asking more from failing subsidiary managers through setting more challenging targets.

So you have to keep those employees happy who have already performed well anyway - yes, you can keep them happy and tell them: "Continue like this [...]." And you can tell the employees who are swimming with the masses: 'You could actually do a bit better.' And the others you might have to attack a bit harder.

On the other hand, when regional managers themselves are under performance pressure from management at headquarters, they may renege on their commitment and ask more from successful subsidiary managers in terms of more challenging targets.

Guys, there's an expectation from management that we have to meet. So one of you guys has to do a little bit more so that another guy can recover first. That's very important.

Finally, we talked to management at headquarters to see whether headquarters anticipates the adverse consequences of a failing regional manager's target setting and adjusts regional managers' targets accordingly. In particular, a regional manager's aggressive target setting is costly to the firm as it induces the ratchet effect, thus hurting the subsidiary managers' long-term incentives and production. To enhance long-term production, management at headquarters prefers the regional managers not to adjust the subsidiary managers' targets extensively for past performance. To the extent that management at headquarters can reduce the regional managers' short-term performance pressure, it decreases the extent to which regional managers ratchet the subsidiary managers' targets. One possibility for management at headquarters to reduce a regional manager's short-term performance pressure is to reduce a failing regional manager's target. Consistently, the following statements suggest that management at headquarters reduces regional managers' targets, but only in case their targets were not achievable due to external reasons.

So [...] if there are [...] circumstances [...] that come from outside, for which [the regional manager] simply can't help, then the targets are also adjusted. Basically, if there are issues where you come to the conclusion: "Well, dear regional manager, you should have been able to recognize that he [the subsidiary manager] wasn't up for it. You could have made adjustments during the year." Then you have to tell him [the regional manager]: "Your management behavior was not quite optimal."

[...] You then have to think about it and question what made [the regional manager] miss [the target]. In the performance review meeting, you then ask for the reasons and causes and then you have to evaluate whether it was simply laziness on the part of the manager because he said, "It was a stupid goal; I'm not up for it," or whether there were any circumstances that led to it.

We take the statements by management at headquarters as motivation to study headquarters' target setting for regional managers, that is, whether headquarters considers the subsidiary managers' target achievements within a region for setting regional managers' targets.

## 5.2 TARGET SETTING FOR REGIONAL MANAGERS

In this subsection, we examine whether management at headquarters adjusts regional managers' targets based on subsidiary managers' past performance. The performance of a region's subsidiary managers allows management at headquarters to infer whether a regional manager's failure originates in laziness or incompetence versus external reasons. Specifically, when most of a region's subsidiary managers missed their targets in the previous period, ultimately resulting in the regional manager also missing her target, this is likely due to external reasons. Thus, we investigate whether management at headquarters adjusts regional managers' targets based on the proportion of a region's subsidiary managers who missed their targets in the previous period.

We present the results of the analysis in table 6. In column 1a, we run the analysis without control variables. In column 1b, we run the full model.

We find that headquarters ratchets regional managers' targets, that is, there is a positive association between regional managers' target achievements,  $\frac{A_{r,t-1}-B_{r,t-1}}{B_{r,t-1}}$ , and their next period's targets,  $\frac{B_{r,t}-B_{r,t-1}}{B_{r,t-1}}$  (COEFF = 0.431;  $p < 0.01$ ; column 1b). Importantly, the interaction between the proportion of a region's failing subsidiary managers,  $(\sum d_{s,t-1})_r$ , and the regional manager's target achievement,  $(\sum d_{s,t-1})_r \times (\frac{A_{r,t-1}-B_{r,t-1}}{B_{r,t-1}})$ , is positive and statistically significant (COEFF = 0.597;  $p < 0.01$ ; column 1b), suggesting that headquarters adjusts a regional manager's performance pressure based on her subsidiary managers' performance. When most of a region's subsidiary managers missed their targets, ultimately resulting in the regional manager missing her target, headquarters more strongly reduces the regional manager's target.

In the previous analysis, we did not control for a regional manager's target achievement,  $D_{r,t-1}$ , since  $D_{r,t-1}$  is highly correlated with  $(\sum d_{s,t-1})_r$  ( $\rho = 0.88$ ,  $p < 0.01$ ). Thus, the finding in table 6 could also be explained by headquarters using regional rather than subsidiary managers' performances when setting the regional managers' targets. To provide support that headquarters indeed considers subsidiary managers' performances for regional managers' targets, we perform a descriptive analysis on how headquarters sets targets for regional managers depending on both the regional managers' and their subsidiary managers' target achievements. Figure 2 shows how a regional manager's target adjustment varies with the proportion of the region's failing subsidiary managers, where we present the adjustment for successful (failing) regional managers in a solid (dashed) histogram.

For a successful regional manager, figure 2 shows that although headquarters generally increases the target, the target increase varies with the

TABLE 6

Target Setting for the Regional Manager: The Role of Subsidiary Managers' Target Achievement

Variables	(1a) $\frac{B_{r,t}-B_{r,t-1}}{B_{r,t-1}}$	(1b) $\frac{B_{r,t}-B_{r,t-1}}{B_{r,t-1}}$
$\frac{A_{r,t-1}-B_{r,t-1}}{B_{r,t-1}}$	0.432*** (0.093)	0.431*** (0.095)
$(\sum d_{s,t-1})_r \times \left(\frac{A_{r,t-1}-B_{r,t-1}}{B_{r,t-1}}\right)$	0.542*** (0.123)	0.597*** (0.134)
$(\sum d_{s,t-1})_r$	-0.033 (0.020)	-0.032 (0.020)
Region FE	No	Yes
Year FE	No	Yes
Constant	0.015*** (0.005)	-0.010 (0.010)
Observations	360	360
Ftest ( $\beta_1 + \beta_2 + \beta_3 = 0$ )		43.28***
Adjusted R-squared	0.281	0.299
F-statistic	45.04***	17.02***

This table presents the results on target setting for the regional manager while considering the role of subsidiary managers' target achievement. In column 1a, we report on the results without control variables. In column 1b, we report on the results using the full model. The analysis is based on monthly data of five regions for the time period 2011 to 2016. *r* indicates the region and *t* indicates the period. We mean-center the variables used in the interaction terms. All regression models are estimated by OLS. Robust standard errors are reported in parentheses.

\*\*\* *p* < 0.01,

\*\* *p* < 0.05,

\* *p* < 0.1.

Variable definitions:

$A_{r,t-1}$  = actual sales per region *r* in period *t* - 1;

$B_{r,t}$  = sales targets per region *r* in period *t*; and

$(\sum d_{s,t-1})_r$  = proportion of subsidiaries that missed their target ( $a_{s,t-1} < b_{s,t-1}$ ) within a region in period *t* - 1.

proportion of failing subsidiary managers. On average, the target increases by 4% when none of the region's subsidiary managers missed his target, by 5% when 17% of the region's subsidiary managers missed their targets, and by only 1.5% when 67% of the region's subsidiary managers missed their targets. For a failing regional manager, the figure shows an even more pronounced association between the proportion of failing subsidiary managers and a regional manager's target adjustment. Although, on average, the target increases by 12.5% if 33% of the region's subsidiary managers missed their targets, the target decreases by more than 5% if all subsidiary managers missed their targets. Thus, headquarters reduces a regional manager's target when many subsidiary managers within the region missed their targets in the previous period.

Overall, the findings from the regression analysis in table 6 and the descriptive analysis in figure 2 suggest that headquarters adjusts a regional manager's target based on the performance of the region's subsidiary managers. Specifically, headquarters reduces a failing regional manager's target if the target failure is likely due to external reasons, captured by many failing subsidiary managers within the region. As performance pressure incites



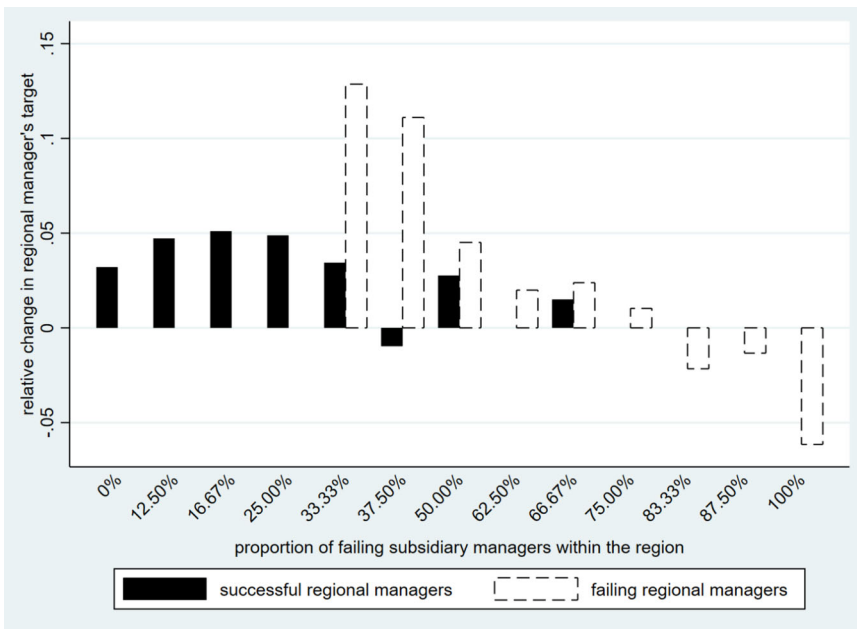


FIG. 2.—Association between subsidiary managers' target achievement and regional manager's change in targets. This figure illustrates the association between the proportion of failing subsidiary managers within the region in the previous period and the average relative change in regional manager's target. We differentiate between successful and failing regional managers. The horizontal axis displays the proportion of failing subsidiary managers within the region; the size of the region varies between two and eight subsidiaries. For example, 16.67% represents the case where one out of six subsidiary managers within a region missed their target in the previous period.

the regional manager to adjust her subsidiary managers' targets for past performance, our results suggest that headquarters' target setting at the supervisory level reflects regional managers' myopic target ratcheting for subsidiary managers. This target setting by headquarters reduces the severity of the ratchet effect (e.g., Bouwens and Kroos [2011]), thus benefiting subsidiary managers' long-term incentives and production.

## 6. Conclusion

We examine how the supervisor's organizational ranking as a middle manager affects the supervisor's ratcheting of employees' targets. In particular, we analyze how the supervisor's own past performance influences how the supervisor adjusts employees' targets for past performance.

Literature documents that supervisors do not fully adjust employees' targets for past performance, which is interpreted as an optimal solution to the underlying dynamic incentive problems in target setting. For example, not penalizing an employee for favorable performance by deemphasizing

past performance in future targets reduces the ratchet effect. However, for this mechanism to work, the supervisor's commitment to the target setting must be credible. We argue that commitment is less credible when a middle manager sets the employees' targets, and the manager is exposed to a target herself. More specifically, we predict that a middle manager exposed to performance pressure chooses myopic targets where the manager strongly adjusts targets for past performance as it likely increases the manager's short-term performance. Increasing targets for successful employees increases short-term performance if the targets are challenging but achievable. Likewise, reducing targets for failing employees increases short-term performance if the targets become achievable. However, because of the ratchet effect, this myopic target setting comes at the cost of employees' long-term incentives, contributing to headquarters' cost of delegating target-setting authority.

We investigate the research question in a firm setting characterized by a three-tier hierarchy comprising management at headquarters, five regional managers, and 30 subsidiary managers, each assigned to a regional manager. Consistent with the prediction, we document that a regional manager who missed her target in the previous period more strongly ratchets subsidiary managers' targets for past performance, relative to a regional manager who met her target in the previous period. This target setting is reflected in a weaker serial correlation in subsidiary managers' target achievements. Additional analysis suggests that management at headquarters anticipates the potentially adverse long-term effects of regional managers' myopic target setting and reduces regional managers' performance pressure when most of the region's subsidiary managers missed their targets in the previous period. We contribute to the literature by identifying a supervisor's hierarchical rank as an important determinant of the credibility of a supervisor's commitment to target-setting practice.

The study is subject to limitations, as its setting is a single firm. Thus, it is an open question whether the results can be generalized to other settings. Future research might explore the role of the supervisor in target setting in other settings, which might differ in their organizational structure or target-setting practices. For example, in a setting where middle managers' decision authority for target setting varies, future research might investigate how the extent of delegating authority to a middle manager affects commitment and in turn the middle manager's target setting.

APPENDIX A: VARIABLE DESCRIPTION

Variable	Description
$A_{r,t}$	Actual sales per region $r$ in period $t$
$B_{r,t}$	Sales targets per region $r$ in period $t$
$D_{r,t-1}$	Indicator variable equal to 1 if $A_{r,t-1} < B_{r,t-1}$ , 0 otherwise
$a_{s,t}$	Actual sales per subsidiary $s$ in period $t$
$b_{s,t}$	Sales targets per subsidiary $s$ in period $t$
$d_{s,t-1}$	Indicator variable equal to 1 if $a_{s,t-1} < b_{s,t-1}$ , 0 otherwise
$RTS_{s,t-1}$	Relative target difficulty at subsidiary $s$ in period $t-1$ , defined as $RTS_{s,t-1} = \frac{\frac{b_{s,t-1}-1}{Emp_{s,t-1}} - \frac{1}{n} \sum_{j=1}^n \frac{b_{j,t-1}}{Emp_{j,t-1}}}{\frac{1}{n} \sum_{j=1}^n \frac{b_{j,t-1}}{Emp_{j,t-1}}}$ where $n$ is the number of subsidiaries in the region where a subsidiary is located.
$Emp_{s,t-1}$	Number of employees per subsidiary $s$ in period $t-1$
$\Delta Emp_{s,t}$	Relative change in the number of employees per subsidiary $s$ from period $t-1$ to period $t$ , i.e., $\frac{Emp_{s,t} - Emp_{s,t-1}}{Emp_{s,t-1}}$
$\Delta WorkDays_{s,t}$	Relative change in the number of working days at subsidiary's location from period $t-1$ to period $t$ , i.e., $\frac{WorkDays_{s,t} - WorkDays_{s,t-1}}{WorkDays_{s,t-1}}$

The appendix presents the descriptions of the variables used in the main analyses.  $r$  indicates the region,  $s$  the subsidiary, and  $t$  the period.

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