Ratcheting Effect and the Role of Relative Target Setting

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Abstract

Managers use a variety of information sources to set performance targets. This paper examines the use of information from comparable responsibility centers. Using data from 376 branches of a large travel retailer over five years, we find that performance of comparable responsibility centers (relative target setting) is associated with target setting after controlling for past performance (ratcheting). Our findings also indicate that relative target setting (RTS) is relevant to assess the information quality of past performance. Specifically, we find that the magnitude of ratcheting decreases (increases) with RTS for favorable (unfavorable) performance variances, and that the asymmetry of ratcheting (different ratcheting coefficients for unfavorable than for favorable variances) is significant for large magnitudes of RTS. Managers use the flexibility associated with the subjectivity of the target setting process (in contrast to the stickiness of contracting and the use of relative performance evaluation) to weigh RTS and past performance differently across different responsibility centers.

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I. INTRODUCTION

Target setting is at the core of the planning processes in organizations. Coordination, resource allocation, and performance evaluation are organizational activities intimately associated with planning and target setting. We provide evidence on the relevance of relative target setting (RTS) where information from comparable responsibility centers is used to set performance targets. The significance of RTS is in addition to past performance (ratcheting). The evidence suggests an alternative way for firms to use relative information beyond evaluation (Aggarwal and Samwick 1999). Moreover, while incentive contracts based on relative performance information are often sticky, target setting can easily change the weight of different sources of information across time and across responsibility centers. The evidence also supports a richer information environment as part of the target setting process beyond the well documented effect of past performance (Bouwens and Kroos 2011; Leone and Rock 2002).

The dataset includes yearly data for 376 branches of a retail travel company between 2002 and 2006 for a total of 1,105 branch-years. For each branch-year, we observe its target and its actual performance. All branches sell the same products, have similar marketing and operating practices, and are grouped into geographical regions. This unique combination of homogeneous product offering and heterogeneous environments allows examining the relevance of past performance as well as the performance of branches in the same region. The budgeted variable to set targets in our research setting is a revenue measure. To set these targets, the firm has a diverse set of information sources available and weighs these sources depending on a myriad of factors particular to the branch (Fisher et al. 2002; Raju and Srinivasan, 1996). While the literature has documented the relevance of past performance to set targets as well as its impact on earnings management and real economic behavior (Leone

and Rock 2002; Matsumura and Shin 2006; Indjejikian et al., 2012; Bouwens and Kroos, 2011; Choi et al., 2012), RTS provides an alternative source of information to reduce the rents associated with private information at the branch level and enhance contracting. The paper contributes to our knowledge of target setting within the context of the budgeting process and control in decentralized organizations.

First, we identify RTS as a relevant variable to the budgeting process. The firm in our study behaves as if it compares performance across its responsibility centers as well as their individual past performance to set targets. The literature has documented the role of past performance as a source of information. In particular, variances (actual versus expected performance) have relevant information for target setting when they are associated with permanent changes in performance. This is consistent with performance being correlated over time (serial correlation) and changes in performance having a permanent (in addition to a transitory) component associated (unrelated) with future performance. Theory (Kirby et al. 1991) as well as empirical evidence (Leone and Rock 2002) suggests that past performance can be optimally used to set targets. Ratcheting happens when favorable (unfavorable) variances lead to an increase (decrease) in future targets.[1, 2] If variances are due to unexpected changes in performance that will be maintained in the future (permanent changes to the production function), then targets will incorporate these changes about future performance and they will be correlated with the performance of the current year. In contrast, if variances only capture transitory changes, then targets will not incorporate this information and will not be correlated with past performance.

[1] We use a broad definition of ratcheting without constraining it to have symmetrical (Weitzman 1980) or asymmetrical responses (Leone and Rock 2002) to favorable and unfavorable variances. Our empirical findings indicate that the asymmetry of these response coefficients vary with the information environment of the supervisor setting targets. We document symmetrical as well as asymmetrical responses across different information environments.

[2] Ratcheting refers to the use of past performance to set future targets and is different from the ratchet effect that refers to the motivational implications of ratcheting; this is, agents reducing their effort to avoid having future targets raised further.

We document how the performance of comparable responsibility centers has information to set targets in addition to the individual performance of each center. A business unit manager in the firm in our research setting described it as follows:

> "Each person and each team have different talents and therefore ability to deliver that it is hard to estimate. But to talk about targets is to talk mainly about justice. If the work, the resources to do it and the context in which it happens are the same, we can and we should demand the same level of performance from everybody."

The performance of comparable responsibility centers has information relevant to set the targets of a particular center because of shared production functions and environmental factors correlated across responsibility centers. Yardstick regulation uses relative performance to set targets in industries such as healthcare, utilities, and defense contractors (Shleifer 1985; Meran and Hirschhausen 2009). For instance, governments reimburse hospitals for the average costs of a group of hospitals used as reference group. Those hospitals that are less efficient end up with more demanding targets, while those that are more efficient have easier targets to meet. We find that RTS is associated with next year's target. Moreover, the relationship is negative and branches whose targets for the previous year were lower than other branches' performance (RTS < 0) have their current targets increase to a larger extent. This result is consistent with supervisors increasing targets to demand these units achieve its peers' productivity and effort level. It also reflects companies rewarding managers performing above its peers with additional rents from having less demanding targets (Indjejikian et al., 2012; Choi et al., 2012). We further document an association between variances and next year's target (ratcheting) as previous research has found.

The second research question examines whether RTS has information relevant not only to set future targets but also to assess the quality of other sources of information and in particular the quality of past performance (ratcheting). The level of RTS has information about the level of effort and the permanent versus transitory components of past performance, both of which are relevant to assess past performance and thus affect ratcheting. We find that supervisors

adapt the weight on past performance to the magnitude of RTS. The information of RTS helps companies adjust the magnitude of ratcheting and minimize the impact of the target setting process on shirking behavior associated with the ratchet effect. Thus, managers behave as if they considered not only direct effects of RTS but also its impact on the information content of other sources of information. Specifically, we find that the more the target of a responsibility center is above of its peers' actual performance, the lower ratcheting for favorable variances and the higher for unfavorable variances. Conversely, the more the target is below of its peers' actual performance, the higher ratcheting for favorable variances and the lower for unfavorable variances.

We further examine the relationship between RTS and the asymmetry of ratcheting. While previous research provides empirical evidence of ratcheting being asymmetric and larger for favorable variances (Leone and Rock 2002), we find that asymmetry varies with RTS. In particular, we find asymmetric ratcheting for large magnitudes of RTS.

In contrast to relative performance evaluation, target setting process is not bound by the stickiness of contracts. Contracts are similar across comparable responsibility centers even if the information content of various performance measures varies across these centers and would require different weighting. Firms seldom adapt contracts to variations in the information content of performance measures over time to maintain a stable contracting environment. In contrast, target setting is a more flexible process and is seldom based on agreed upon formulas but rather on subjective assessments. This flexibility allows target setting to be more responsive to changes in the information environment.

The rest of the paper is organized as follows. Next section presents the literature on ratcheting and RTS and develops the hypotheses empirically tested. Section 3 describes the research setting and the research design. Section 4 presents and discusses the results. Section 5 concludes.

II. LITERATURE REVIEW AND HYPOTHESES

Target setting of financial variables associated with budgets are often used to anchor incentive systems (Indjejikian and Nanda 2002; Matsumura and Shin 2006). These incentive systems compare actual versus targeted performance to determine compensation. Supervisors in hierarchies (principals with agents reporting to them) have discretion to adjust these targets to optimize compensation risk, enhance the perceived fairness of the compensation system, and respond to the status of the manager whose target is being determined (Bol et al. 2010). Financial targets are embedded in budgets that organizations use to allocate resources, coordinate efforts, and evaluate performance (Demski and Feltham 1978). Given the relevance of budgets to organizations and in particular to compensation systems, a significant literature around budgets and the budgeting process has developed (Brownell and Merchant 1990; Dunk and Nouri 1998).

Supervisors use a diverse set of information sources to set targets. One well-documented source is past performance: targets for the current year are influenced by the difference between last year's performance and its original target (ratcheting). In particular, a favorable variance last year is associated with an increase in the target for the current year, while an unfavorable variance is associated with a decrease (Weitzman 1980). The formulation for the model is:[3]

$$(B_t - B_{t-1})/B_{t-1} = \alpha + \lambda_+(A_{t-1} - B_{t-1})/B_{t-1} + \lambda_- D_{t-1}(A_{t-1} - B_{t-1})/B_{t-1} \quad (1a)$$

Where B_t is next year's budget, B_{t-1} is the budget for the current year, and A_{t-1} is the actual performance for the current year. α captures the change in budget independent of previous performance and often associated with company-wide growth. Each of the other two

[3] Alternatively, the formulation in absolute terms is:

$$(B_t - B_{t-1}) = \mu + \beta_+(A_{t-1} - B_{t-1}) + \beta_- D_{t-1}(A_{t-1} - B_{t-1}) \quad (1b)$$

Model (1b) assumes that ratcheting depends on the absolute variance while Model (1a) assumes that it depends on the relative variance. Whether Model (1a) or Model (1b) best captures ratcheting at a particular firm is an empirical issue. Normalizing model (1b) by a measure of size like B_{t-1} to control for heteroskedasticity leads to a model similar to model (1a) but with a normalized intercept.

terms measures the level of the effect and its asymmetry respectively. λ_+ is the response coefficient for favorable variances and λ- is the incremental coefficient for unfavorable variances. D_{t-1} is set to one for unfavorable variances and zero otherwise.

The magnitude of ratcheting coefficients reflects supervisors' beliefs about permanent versus transitory components of changes in performance. Supervisors ratchet targets to incorporate permanent changes in performance in yearly budgets and reduce budgetary slack and influencing costs that arise in participative budgeting. Permanent changes in performance are expected to remain in the future while transitory changes only influence current period performance. In the presence of perfect information, ratcheting incorporates permanent improvements into targets and excludes transitory ones that are associated with random events (random noise). The magnitude of ratcheting also influences the impact of changes in performance on incentives. A lower ratcheting response coefficient for favorable variances delays targets reflecting permanent performance improvements and increases agent's pay-off.[4] Previous work provides empirical evidence consistent with ratcheting (Lee and Plummer 2007; Ettedge et al. 2008) and agents influencing discretionary accruals to offset transitory earnings (Leone and Rock 2002). Also Choi et al. (2012) find that firms commit to attenuated ratcheting in target revisions. This limited or incomplete use of information available from past performance (lower magnitude of ratcheting) allows unit managers to earn rents over time.

Asymmetric responses happen when $\lambda_- \neq 0$ and reflect different weights on favorable versus unfavorable variances. Asymmetric response coefficients are consistent with various arguments. First, if contracts are written on earnings, accounting conservatism leads to earning increases that are more permanent than earnings decreases. The different combination of permanent versus transitory components of performance measures explains the asymmetry.

[4] A ratcheting coefficient of one will incorporate permanent changes into the target in one period. A smaller ratcheting coefficient will adjust the target to reflect a permanent change in performance over several periods and provide additional rents to the agent.

Second, smaller ratcheting coefficients for unfavorable variances provide incentives for agents to invest in actions leading to permanent rather than transitory performance improvements. Third, agents' incentives often have a call option shape bounded at zero if the minimum performance is not met. The ratcheting coefficient will be asymmetric to reflect the asymmetry of the incentive function. Fourth, motivational arguments support asymmetric ratcheting. In particular, Indjejikian et al. (2012) find asymmetry with ratcheting being significant for favorable variances in poorly-performing companies and for unfavorable variances in well-performing companies.

Supervisors also set targets beyond available information to reflect power structures in the organization. Bol et al. (2010) find that supervisors strategically make discretionary adjustments in targets to avoid conflicts providing more attainable targets to store managers with relatively higher hierarchical status, since those managers are more likely to confront their superiors. Moreover, they also find that supervisors provide easier targets to stores facing more challenging reference groups when employees feel that the composition of the groups impairs the overall fairness of the incentive system.

Relative Target Setting

Supervisors have additional information to set budgets beyond last year's performance variance. In particular, they have information on the expected and actual performance of comparable responsibility centers. Relative performance evaluation (RPE) has often been identified as an effective way to eliminate correlated external shocks in performance evaluation and enhance incentive contracts (Antle and Smith 1986; Holmstrom 1982; Holmstrom and Milgrom 1987). RPE happens *ex-post* to evaluate and reward once the performance of a responsibility center and its peers is observed. We define RTS as using information from a reference group to set the target of a responsibility center. In contrast to RPE, RTS works *ex-ante* when the information of peers' past performance is used to set targets.

Empirical evidence is consistent with RPE at lower levels of the organization (Matsumura and Shin 2006). At the CEO level, RPE is associated with external criteria such as the level of performance of comparable companies (reference group) (Garvey and Milbourn 2003). Yet, the evidence is not as robust as expected (Aggarwal and Samwick 1999). Comparable companies relevant to RPE have been shown to be a narrower set than previously believed, not only within the same industry but with similar technology, complexity, and size (Albuquerque 2009). Units within a company will be more relevant as a reference group the closer their market environment, operational structure, and size.

RPE controls for external common shocks *ex-post* that affect to a similar extent a group of peers; its purpose is to reduce the variance of the noise term and enhance the signal-to-noise ratio. *Ex-ante*, past performance of comparable branches captures the common component of performance across the reference group; it has information to better characterize the production function and business environment of a particular responsibility center and set more accurate targets. In the same way that performance measures that have incremental information content are optimally used in designing efficient contracts (Holmstrom, 1982); supervisors will optimally use RTS to set targets if it has incremental information beyond the information captured in past performance (ratcheting). If a group of responsibility centers are comparable, operate in the same industry, have similar technology, operational structure, complexity, size, and market environment (Albuquerque 2009), they will likely have a comparable production function. Changes in these factors will affect all comparable units to a similar extent. Information from peers becomes a relevant mechanism to use information optimally (Holmstrom 1982).

Equation (1a) indicates that if actual performance in year *t-1* equals budgeted performance ($A_{t-1} - B_{t-1} = 0$), there is no ratcheting and, therefore, the target in year *t* for this responsibility center will only be adjusted for the constant α that incorporates company's

expected changes in general economic conditions (that affect similarly to all units).[5] However, if the performance of this unit in period *t-1* is below the average performance of peer units, it may reflect an increase in productivity or effort in year *t-1* among peers that this unit has not yet achieved, potentially because its target proved to be too easy.[6, 7] Supervisors can use this additional piece of information beyond last year's variance and increase the target of this unit for year *t* to demand the team to achieve its peers' productivity and effort level. Motivational arguments also predict an increase in future targets: supervisors see the performance of comparable units as a demanding but feasible target (Merchant and Van der Stede, 2007). A responsibility center whose performance is below its peers' performance will see its target increased. In contrast, if performance is above the average performance of peer units, the level of productivity and effort for the center is likely to be above its peers. Further increases in targets can demotivate employees or even lead to opportunistic behaviours (Bowens and Kroos, 2011).

If the supervisor believes that a particular responsibility center is comparable to other responsibility centers, RTS provides information about deviations from the average productivity and level of effort. We predict that RTS will be an additional element (γ) in setting up next year's budget, and will have a negative sign (γ<0).

$$(B_t - B_{t-1}) / B_{t-1} = \alpha + \lambda_{+}(A_{t-1} - B_{t-1}) / B_{t-1} + \lambda_{-} D_{t-1}(A_{t-1} - B_{t-1}) / B_{t-1} + \gamma\ RTS \qquad (2)^{8}$$

H1: Relative target setting is negatively associated with next year's targets.

[5] In our research design we also incorporate dummy variable for different years and the various regions (as well as an error term) that capture other potential adjustments unrelated to past performance.

[6] We define RTS as using peers' performance information to complement individual performance information in setting targets. Individual past performance is operationalized as performance relative to targets ($A_{t-1} - B_{t-1}$). RTS can be operationalized as actual performance of a unit relative to its peers' average performance ($A_{t-1} - Average(A_{t-1})$) or, alternatively, as expected performance of a unit relative to its peers' average performance ($B_{t-1} - Average(A_{t-1})$). The first approach compares individual performance to peers' performance, showing whether the outcome of the unit in *t-1* is above or below the level of productivity achieved by its peers. The second approach provides a measure of the relative difficulty of the target for year *t-1*: whether *ex post* the target proved to be too easy or too hard compared to peers.

[7] A change in productivity reflects a permanent change in performance to be incorporated in future expectations of performance.

[8] Similarly to the specification for ratcheting (equations 1a and 1b), an equivalent specification for RTS uses absolute instead of relative values.

RTS is not unique to target setting. It is often observed in regulatory settings under the concept of yardstick regulation. This type of regulation is commonly used within the context of franchised monopolies subject to cost-of-service regulation; regulators use the cost of delivering a product or service of a group of comparable organizations (average cost) to set the price that the government reimburses these organizations (Shleifer 1985, Meran and Hirschhausen 2009). For instance, reimbursement for medical procedures is calculated as the average cost of these procedures for a set of hospitals used as reference group. The regulator uses relative performance to set a benchmark and structure incentive systems.

The Information Content of Relative Performance and Past Performance

In addition to a direct effect of RTS on performance targets as a mechanism to incorporate information from comparable responsibility centers, RTS itself is relevant to assess the information quality of past performance. Supervisors weigh past performance (the magnitude of ratcheting) differently depending on the magnitude of RTS. The ratcheting component in Model (1) ignores additional information from the performance of peers: coefficients λ_+ and λ_- are constant. Yet, if supervisors believe responsibility centers are comparable, RTS is relevant to assess the information content of past performance to set targets and ratcheting coefficients will vary with RTS.

In particular, RTS provides information about the likelihood of permanent versus transitory components of performance variances. The former are associated with shifts in the production function (changes in the operations or in the market that redefine the input-output relationship), while the latter are associated with transitory events associated with the noise term. Permanent changes (e.g., improvements in productivity) can be sustained in following periods without further increasing the level of effort and will optimally be incorporated into next year's targets. In contrast, transitory changes can only be sustained if effort increases in

subsequent periods beyond their optimal level (Bouwens and Kroos 2011) and are not optimally incorporated in new targets.

If a permanent improvement (worsening) in productivity is enjoyed (suffered) by comparable centers to a similar extent, the average performance of a reference group provides a benchmark for the level of productivity of comparable units. Units with negative RTS have more room to take actions leading to permanent performance improvements (and catch up with its peers) than units with more difficult targets. A positive RTS indicates the opposite, i.e., that the center is putting more effort and therefore its marginal output per unit of effort is lower.[9] If RTS is informative about the level of productivity and effort, then it has information about the permanency and transience of past performance.

A center with performance above its peers and a favorable variance is more likely to have benefited from transitory events or exerted additional effort and the favorable variance will be difficult to sustain. For this center, the ratcheting coefficient will be smaller. Conversely, a responsibility center with a relatively easy target, below its peers, and a favorable variance indicates that the center is closing the gap and catching up with the benchmark productivity (average productivity of the reference group). This improvement is more likely to persist over time reflecting a permanent change in the production function of the unit. If this is the case, past performance will receive more weight.

H2a: The magnitude of ratcheting decreases with relative target setting for positive performance variances

The previous argument predicts a lower weight on favorable variances as RTS increases. Units that have unfavorable variances are expected to behave similarly. A center with an unfavorable variance but performance above its peers' is more likely to be converging back to

[9] Assume two comparable responsibility centers with sales potential of $1. Current sales are $0.90 and $0.50 respectively. Increasing the target for next year in the same amount ($0.02 for instance) demands a higher increase in effort for the center with higher performance. Decreasing returns to effort (concave production function) imply that increasing sales from $0.90 to $0.92 requires significantly more effort than moving from $0.50 to $0.52.

its benchmark value of productivity and effort. Supervisors will incorporate this relative information on past performance and give more weight to past performance. An unfavorable variance for a responsibility center with negative RTS is likely to reflect a low level of effort or an unexpected transitory negative event and ratcheting of past performance will be small. These arguments predict that the level of ratcheting varies with RTS in the following terms:

H2b: The magnitude of ratcheting increases with relative target setting for negative performance variances

Previous literature has documented asymmetries. In particular, Leone and Rock (2002) find smaller ratcheting coefficients for unfavorable than for favorable variances. Yet, this asymmetry is homogeneous across business units and reflected in the significance of λ- in equation (1). The behavior predicted in hypotheses 2a and 2b indicates that the asymmetry in ratcheting coefficients is not associated with the budget setting process *per se* or the variables used within this process, but it depends on the informativeness of past performance. Supervisors can assess the probability of permanent versus transitory components of past performance using the information from peers. If this is the case, the asymmetry of ratcheting will depend on the magnitude of RTS. The arguments leading to hypotheses 2a and 2b predict asymmetry of ratcheting for larger magnitudes of RTS when the probability of transitory components on past performance is larger. In particular, a favorable variance with large positive RTS is likely to reflect a transitory component and a small ratcheting coefficient (past performance has little information about permanent changes); while large positive RTS and unfavorable variances indicate the unit regressing back to its average performance and past performance reflects permanent changes. Conversely, negative RTS and unfavorable variances are more likely to reflect negative unfavorable transitory component. Negative RTS

and favorable variances indicate a regression to mean performance. Thus, asymmetry is predicted to happen for larger magnitudes of RTS.[10, 11]

H2c: Ratcheting coefficients are asymmetric for large realizations of RTS.

The interaction of RTS and ratcheting predicted in hypotheses 2 are also consistent with arguments associated with ratchet effect. Opportunistic behavior associated with the ratchet effect (Bowens et al., 2011) is more likely to happen at individual than at group level that requires the coordination of all managers in the group. RTS provides supervisors with relative group information to identify managers' potential self-interested behavior to exert less effort and minimize favorable variances. If supervisors only use individual past performance, a favorable variance can be interpreted as good performance when relative target setting would indicate otherwise. For instance, a small favorable variance combined with an easy target (RTS<0) can signal a reduction in effort to avoid ratcheting. In this case, past performance will be weighted more than if the same variance occurs with a difficult relative target (RTS>0). Second, the likelihood of ratchet effect increases with the level of effort as responsibility centers get close to capacity. RTS helps supervisors evaluate how close managers are from reaching full capacity. Decreasing returns to effort imply that the expected performance increase of a center will be lower the higher its current level of performance. Target revisions for these centers are more likely to induce ratchet effect as managers protect themselves from having targets too hard to reach. Supervisors will limit this behavior lowering the magnitude of ratcheting for those centers with positive RTS to a larger extent. Therefore, the level of ratcheting will decrease with the magnitude of RTS for positive variances, and increase for negative.

[10] Figure 1 provides a graphical representation of hypotheses 2 using the actual results in our research setting.

[11] Downwards rigidities of targets in the form of smaller coefficients of ratcheting for unfavorable than for favorable variances penalize transitory variances and promote actions leading to permanent performance improvements (Leone and Rock, 2002). If a unit's target is below average peers' performance, the unit has more opportunities to apply permanent improvements. Our hypotheses are consistent with the asymmetry of ratcheting changing across business units and supervisors penalizing more heavily transitory changes the higher the probability to achieve permanent changes in performance.

These predictions are also consistent with motivational arguments where relative performance affects the weight on past performance to reward managers with above-average performance with additional rents. These rents are intended to enhance incentives (Indjejikian et al., 2012). In particular, these authors argue and find that well-performing firms reduce earnings targets if their managers fail to meet their prior-year targets but rarely increase earnings targets even if their managers exceed prior-year targets. In contrast, poorly-performing firms commonly revise targets upwards if their managers exceed their prior-year targets but rarely decrease earnings targets otherwise.

III. RESEARCH DESIGN

Description of the research site

This study uses quantitative and qualitative field data from a large European travel company together with official government data for the industry. The company has operations in all of the stages of the industry's value chain including travel agencies, tour operators, airlines, receiving agencies, and hotel chains. The travel agency has four business units: (1) vacation (individual), (2) business travel, (3) conventions and incentive trips and, (4) conference organizing. The research site for this study is the vacation division within the travel agency division that had revenues of €444 million in 2006, about 60% of the travel agency's revenues.

The vacation division had between 244 (2003) and 361 (2006) branches located in a European country and structured around 13 geographic areas, each one managed by a regional director. These branches are grouped based on geographical proximity with similar demographics and most of them are located in urban areas. These branches, treated as separate profit centers, sell only vacation products; the other three business units use different distribution channels for their non-vacation products with a heavy emphasis on a direct sales force. Each year, branch managers have a revenue target for their branches linked to their economic compensation. This target is set for what the company calls "guided sales." These

are sales of products from other divisions in the company (tour operator, airline, receiving agencies, and hotels) and specific suppliers considered to be strategic for the company. The ratio of "guided sales" to total branch sales (which has been increasing throughout the years) is decided at the division level. Therefore, once a target "guided sales" is defined, overall sales are also set through this ratio. The target profit for the branch is also set through expense ratios (such as representation expenses over sales, discounts over sales, etc.) in a similar way as total target sales are determined. Thus, once the target "guided sales" is decided, the rest of the branch's income statement is created mechanically through mathematical calculations.

The "guided sales" budgeting process starts with a negotiation between the branch manager and the regional director. Then the regional director proposes a "guides sales" target for each branch. Once "guided sales" targets have been set for all branches, regional directors review the overall target with the general manager of the division to insure that branches' targets reach the financial objectives set for the division. Regional directors revise the targets if needed to incorporate this top-down piece of information and then inform branch managers about their final "guided sales" and associated profit target. The target setting process does not use a formula to set the target for "guided sales," the process is subjective in that it is the outcome of regional managers integrating different sources of information. Any associations with the change in targets from one year to the next are inferences form the observed behavior rather than the outcome of specific formulas. Interviews with managers at different levels in the company indicated that the target is not the outcome of a fixed set of information. Rather, regional directors integrate the information that they have from their on-going dialogue with branch managers, periodic visits and reports throughout the year. This on-going dialogue gives them a very good understanding of the commonalities and specificities of each branch in their region. When further asked about specific information, they indicated that they used a large set of information including pieces such as past targets and past performance of the branch, past targets and past performance of other branches (comparing branches in the

region), industry and local trends, significant expected events, competitors' expected moves, discussion at the divisional level, the personality of the branch manager and his or her team, and the financial objectives of the company.[12]

The incentive system works at the branch level and the bonus for the branch is assigned to the employees of the branch according to their professional rank. Table 1 describes the incentive system. The bonus accounts for 10 to 20% of a branch employee's salary. Half of the bonus is associated to "guided sales." This part of the bonus is paid bimonthly and kicks in from the first euro sold (much like a commission). The other half of the bonus is determined at the end of the year and is based on profits. This part of the bonus has a floor at 70% of the targeted profit below which this half of the bonus is not paid. Between 70% and 130% of the targeted profit there is a linear relationship between target achievement and the bonus; if the branch reaches 70% of the profit target it receives 70% of this part of the bonus, at 100% the branch gets the full payment associated with this piece of the bonus, and at 130% it gets 130%. Beyond this threshold, the bonus does not increase. For example, a branch that precisely meets its "guided sales" and its profit targets, would get 100% of the bonus. A branch that sells 10% above its target "guided sales" would receive a sales-related bonus of 55% of the expected total bonus (110% * 50%); if this branch's profit was 20% above the targeted profit it would receive an additional 60% (120% * 50%) of the expected total bonus. The total bonus would be 115% of the expected total bonus.

In addition to this two-piece bonus, branches have rewards (and penalties) associated with the outcome of internal audits, quality of the customer database, level of discounts given, and bad debt expense. A subjective bonus is added to this incentive scheme to account for unique issues associated with a particular branch.

[12] Regional directors mentioned both past targets and past performance of comparable branches as being in their information set, so the research setting did not suggest a specific way of operationalizing RTS. Regional directors did not specifically mention whether they used an absolute or a relative model for changes in targets; they sometimes would refer to these changes in percentage terms, thus suggesting a relative model (the one used in the statistical tests) but when further pressed whether they actually used a relative model, they answered that it was not always the case.

Data collection and variable description

The study is based on a total population of 376 branches of the vacation business unit during the period between 2002 and 2006. For a branch-year to be included in the analysis, we require performance information actual (A_{t-1}) and budgeted "guided sales" (B_{t-1}) for year *t-1*, budgeted "guided sales" (B_t) for year *t*, and other relevant variables for year *t* (all of them available if B_t is available). Thus, our first year of analysis is 2003 (using budgeted "guided sales" for 2003 and actual performance in 2002) and our last year is 2006 (using budgeted "guided sales" for 2006 and actual performance in 2005). The total number of branch-year observations is 1,105. Table 2 describes how the final sample is determined. For a certain year only branches that operated the previous year and were not closed during the current year (for which there is no budget for the year as the decision to close is made before the year starts) are eligible. For instance, to build the 2005 sample, we start with the 294 branches that operated in 2004 and thus their actual versus budgeted performance is available (A_{t-1} - B_{t-1}). We eliminate the 11 branches that were closed during 2005 for a 2005 final sample of 283. In addition, 78 branches were opened during 2005 (for which we have B_t but not A_{t-1} - B_{t-1}) giving a starting number of branches for 2006 of 361.

Table 3, Panel A provides descriptive statistics from 2002 to 2006 on budgeted and actual average branch "guided sales" and total sales and the relationship between these two variables. During this period, target "guided sales" grew from €647,596 to €929,385 and the percentage of target "guided sales" to total sales also grew from 67.6% in 2002 to 76.8% in 2006. The budget increase for "guided sales" varied from 15.5% (2003) to -0.54% (2006). Actual "guided sales" growth varied between 15.9% (2003) and 3.6% (2005). Finally, Panel A, Table 3 indicates that the percentage of branches that exceeded the "guided sales" budget varied between 25.2% (2005) and 50.7% (2004) (the average percentage of year-branches that exceeded this target was 42.3%).

Table 3, Panel B provides additional descriptive statistics on the previous variables. The average "guided sales" are €766,615 compared with an average target of €840,329. The average percentage of actual "guided sales" over total sales is 75.7% while the average target is 73.9%.

Our variable of interest is the change in budgeted "guided sales" defined as ($B_{i,t}$ - $B_{i,t-1}$). Following previous literature (Leone & Rock, 2002), we operationalize past performance as performance relative to target; in our case, the difference between expected and actual "guided sales" ($A_{i,t-1}$ - $B_{i,t-1}$). Ratcheting predicts a positive relationship between change in budgeted "guided sales" and past performance. We define a dummy variable to capture the possibility of an asymmetric impact of the ratcheting depending on whether the variance is favorable or unfavorable; $D_{i,t-1}$ takes a value of 1 for unfavorable variances ($A_{i,t-1} < B_{i,t-1}$) and zero otherwise.

Supervisors incorporate information from comparable branches through RTS. We define RTS as using peers performance information to complement individual performance information in setting targets of individual units. Performance can be expected (targeted) and actual performance; supervisors indicated that both pieces of information are relevant to assess relative performance and the difficulty of targets. Thus, RTS can be operationalized as actual performance of a unit relative to its peers' average performance, showing whether the outcome of the unit in *t-1* is above or below the level of productivity achieved by its peers. RTS can also be operationalized as expected performance of a unit relative to its peers' average performance, providing a measure of the relative difficulty of the target for the unit in year *t-1*. ($A_{i,t-1} - Average(A_{j,\ t-1})$) is the sum of (($A_{i,t-1} - B_{i,t-1}$) plus ($B_{i,t-1} - Average(A_{j,\ t-1})$). We use the first term to operationalize past performance and the second term to isolate the effect of information from peers (target difficulty). RTS is operationalized as targeted "guided sales"

per employee (to consider size effects) minus average "guided sales" per employee for the branches in its region. In particular we define it as:[13]

$$\text{RTS}= B_{i,t-1} / employees_{i,t-1} - (\sum_{j=1}^{n} A_{j,t-1} / employees_{j,t-1}) / n$$

Where n is the number of branches in the region. A positive relative target setting indicates a challenging target in that it is higher than the average performance of the branches in the same region the same year. A negative RTS indicates the opposite.

In addition to the main variables in the model, we control for variables that may affect changes in targets over time. Branches that have additional resources to their disposal are likely to see their targets increase. Our research site has a service orientation and its main resource is the employees who perform the commercial transactions. The main resource is the number of people working at the branch. We measure the "additional branch resources" variable as the change in the number of employees in the branch from the previous to the current year. This definition considers the fact that most decisions about the size of a branch (in terms of number of employees) are made during the planning period. Because at certain periods during the year temporary personnel is hired, we define number of employees as total number of hours worked divided by the working hours of a full-time employee. To control for size we include number of employees.

We control for changes in the level of competition to control for the effect of an increase in the number of competitors on the expected level of sales. We capture the change in competition as the change in the number of travel agencies' branches (our research site as

[13] Another effect of using last year's individual targeted performance is limiting the noise that affects individual actual performance. The effect of noise in the average performance term is lower because when averaging the noise terms for the different branches cancel each other (assuming they are uncorrelated) and provide a more robust measure that the individual branches' measures. We ran our tests with alternative ways to operationalize RTS. In particular, the results are consistent when defining RTS as relative expected performance: $B_{i,t-1} / employees_{i,t-1} - (\sum_{j=1}^{n} B_{j,t-1} / employees_{j,t-1}) / n$

They are also consistent when RTS is defined as $A_{i,t-1} / employees_{i,t-1} - (\sum_{j=1}^{n} A_{j,t-1} / employees_{j,t-1}) / n$

This latter formulation is less significant because of the noise associated with actual performance and the coefficients have lower t-statistics although they are all significant at least at the 10% level.

well as its competitors) per million inhabitants. This data comes from the government statistical office. We compare the current to the previous year. We measure this variable at the regional level.

Because the uncertainty around the performance potential may vary among branches, we separate new and mature branches using a dummy that identifies those branches older than four years.

We also control for changing economic conditions across time using dummy variables for each year. Targets may vary year to year depending on expectations for the coming year and whether the economic situation will improve or deteriorate. Finally, we include a dummy for each region to control for the potential effect associated with the supervisor. Because the target setting process is negotiated between the branches and the regional supervisor, this person's approach to the target setting process may affect the final targets.

Table 4 presents descriptive statistics on these variables in relative (Panel A) and absolute terms (Panel B). The average increase in "guided sales" target is €71,101 (13.8%) with more than 25% of the branches having their target reduced from one year to the next. Mean branches' "guided sales" were €28,932 (4.0%) below their targets. Favorable variances were €104,934 (14.4%) above target (463 branch-years had favorable variances) and unfavorable variance where €122,951 (16.9%) below target. Relative target setting (RTS) has a value of -9.8% in its first quartile (25%) and €19.3% in its third quartile (75%) indicating significant variation across branches. Half of the branch-year observations do not see changes in their number of employees consistent with most branches working at a steady state regime. Finally, branch density increases during this period at about a 4.6% yearly rate.

Table 4, Panels A and B, also presents the one-lag correlation of relevant variables. Branch performance is positively associated with previous period's performance (0.18 in relative terms). Serial correlation can be interpreted as evidence of attenuated use of past performance in target revision (Indjejikian and Nanda, 2002). In addition, RTS has a positive

association with the previous period's RTS of 0.52. This correlation decreases with time, being 0.35 (not tabulated) for two lag periods. It implies a gradual incorporation of peers' information into target revision.

IV. RESULTS

Ratcheting

As a starting point and to compare our setting to previous studies, we estimate a model that examines ratcheting in isolation and includes the variance as the only explanatory variable. In particular, we estimate the following model (1):

$$(B_{i,t} - B_{i,t-1}) / B_{i,t-1} = \alpha + \lambda_{+}\left(A_{i,t-1} - B_{i,t-1}\right) / B_{i,t-1} + \lambda_{-} D_{i,t-1}\left(A_{i,t-1} - B_{i,t-1}\right) / B_{i,t-1} + \varepsilon_{i,t} \qquad (1)$$

We estimate the model controlling for region and year and with Huber-White robust standard errors clustered by branch. We include the following control variables: employee growth, change in local competition, number of employees, and branch maturity.

Table 5, Model 1 reports the results. The R^2 is 46.62%.[14] Ratcheting is indeed present, consistent with prior evidence. Each additional percentage point increase in last year's performance over its target is associated with a 0.96% increase in this year's target compared to last year's.[15] The coefficients on the ratcheting indicate a significant asymmetric effect. Those branches with unfavorable variances have a ratcheting coefficient of 0.33 (0.96-0.63 = 0.33). A percentage point decrease in performance is associated with a decrease in next year's budget of 0.33%. Branches that underperformed relative to their target see their target for the coming year ratcheted less than those branches that performed above their target. Supervisors appear to weigh past performance differently depending on the sign of the variance. For unfavorable variances they give less weight to past performance in setting upcoming targets.

Relative Target Setting (RTS)

[14] In contrast, Leone and Rock (2002) have an R^2 of about 75%. This difference implies that despite both research settings dealing with internally set targets our research site appears to rely to a much lesser extent on the previous year performance to set targets.

[15] We also ran the model controlling for change in sales in the previous year to include an additional control for growth. This model loses all the observations from the first year. Conclusions remain unchanged.

Our first hypothesis predicts RTS to be relevant in setting targets. If supervisors use peers' performance as a benchmark to establish the productivity level that can be demanded from individual units, branches with targets below the average performance of its peers will see their targets increased to induce performance improvements. Branches with targets above peers' average performance will see their targets increased to a lower extent to avoid the demotivation that can result from setting targets that are too demanding. The coefficient on RTS is predicted to be negative.

Table 5 presents the results for the following model:

$$(B_{i,t} - B_{i,t-1}) / B_{i,t-1} = \alpha_0 + \lambda_+ (A_{i,t-1} - B_{i,t-1}) / B_{i,t-1} + \lambda_- D_{i,t-1} (A_{i,t-1} - B_{i,t-1}) / B_{i,t-1} + \gamma\ RTS_{i,t-1} + \varepsilon_{i,t} \qquad (2)$$

The coefficient on RTS is negative and significant (-0.51) suggesting that last year's target relative to other branches in the region is associated with the target setting process. In particular, those branches with more demanding targets (that exceeded the average performance of their region) see their targets increase to a lower extent than those branches with targets below their peers' performance. This is consistent with the arguments leading to hypothesis one. The coefficient on ratcheting remains positive, significant and asymmetrical. The absolute value for the coefficient of RTS (0.51) is slightly lower than the coefficient of ratcheting for favorable variances (0.73) and slightly higher than the ratcheting for unfavorable variances (0.35). The results imply that an average favorable variance of 14.4% above target (see Table 4) will result in an upward revision comparable to an RTS of -20.6% (about the 10th percentile of RTS). Conversely, units having an average unfavorable variance of 16.9% (see Table 4) will see their targets decrease as much as the decrease associated with an RTS of 11.6% (about the 65th percentile of RTS).[16, 17] Change in number of employees is

[16] We run several robustness checks. First, we use $B_{i,t}/ B_{i,t-1}$ instead of $(B_{i,t} - B_{i,t-1}) / B_{i,t-1}$. Since $B_{i,t}/ B_{i,t-1}$ is equal to $1+ (B_{i,t} - B_{i,t-1}) / B_{i,t-1}$, the conclusions remain unchanged. Second, we scaled Models 1 and 2 by the number of employees instead of past year's target. Conclusions remain unchanged.

[17] Defining RTS using actual performance in the previous year instead of targeted performance leads to identical conclusions. The coefficient for RTS is negative and significant as well as the coefficients on ratcheting. The t-statistic is lower because actual performance is a noisier measure because it incorporates unexpected shocks to performance. Noise is reduced in the average term used to estimate relative performance as uncorrelated terms

positive indicating that supervisors consider the fact that a branch has more resources to meet its targets. Size is negative and mature branches see their targets increased to a lower extent reflecting supervisors' beliefs that these branches face a more stable market.

Appendix A reports the results using alternative specifications. In particular, it reports results using absolute and per employee models.

The Influence of Relative Target Setting on Ratcheting

Hypothesis 1 predicts that RTS is associated with target setting. Hypotheses 2 predict that RTS modifies the magnitude of ratcheting. Specifically, RTS moderates the relationship between past performance relative to targets and future targets. We test hypotheses 2a and 2b including interaction effects (ϕ_+, ϕ_-) between RTS and ratcheting:

$$(B_{t+1} - B_t)/B_{i,t-1} = \alpha + \lambda_+(A_t - B_t)/B_{i,t-1} + \lambda_- U_t(A_t - B_t)/B_{i,t-1} + \gamma\ RTS + \\ + \phi_+(A_t - B_t)/B_{i,t-1} * RTS + \phi_- U_t(A_t - B_t)/B_{i,t-1} * RTS \qquad (3)$$

A negative coefficient on the interaction term for favorable variances (ϕ_+) is consistent with hypothesis 2a. The total magnitude of ratcheting for favorable variances is $(\lambda_+ + \phi_+ * RTS)$. A positive (negative) RTS times a negative coefficient reduces (increases) the effect of past performance. For unfavorable variances, we predict a positive sign for the interaction coefficient ϕ_-. The total magnitude of ratcheting for unfavorable variances is $(\lambda_+ + \lambda_- + (\phi_+ + \phi_-) * RTS)$.

The results in Table 6 indicate that in the absence of relative target setting ($RTS_{i,\ t-1}$=0), ratcheting coefficient for favorable variances remains positive (0.56). Similarly, when the previous year's actual performance is equal to its budgeted level (A_{t-1} - B_{t-1}=0), the effect of RTS is -0.26: smaller but comparable to ratcheting.

The coefficients for the interaction terms are significant in the expected direction. Branches with favorable variances and targets above their peers' performance see lower

cancel each other. Conclusions remained unchanged if average expected performance is used instead of actual average performance.

ratcheting, while those with unfavorable variances see a higher ratcheting coefficient. This is consistent with RTS having information to assess the information content of past performance (ratcheting). RTS lowers the magnitude of ratcheting for branches with favorable variances and enhances the magnitude of ratcheting for branches with unfavorable variances. Figure 1 plots the change in ratcheting coefficients as RTS changes based on the results in Table 6.[18] The x-axis is the level of RTS and the y-axis is the magnitude of the ratcheting. These results are consistent with recent evidence from a questionnaire-based cross-sectional sample of companies (Indjejikian et al., 2012).[19]

The results in Table 6 and Figure 1 indicate that when RTS is at the mean (RTS=0), ratcheting is symmetrical; this is the ratcheting of past performance is not significantly different for favorable and unfavorable variances. As RTS becomes more negative, the coefficient for favorable variances is larger than for unfavorable variances. Conversely, as RTS becomes more positive, coefficients for unfavorable variances are larger than for favorable variances.[20]

Hypothesis 2c predicts that asymmetry is not constant but rather varies with the information environment. To analyze asymmetry across levels of RTS, we introduce three dummies for easy (E_{t-1}), medium, and challenging (C_{t-1}) RTS in Model (1). These three groups identify branch-years where RTS has different information content about past performance. For branches within the easy group, favorable variances reflect improvements towards their expected output and thus ratcheting will be larger. In contrast, unfavorable variances might indicate some transitory unfavorable shocks and ratcheting will be small. The

[18] These results indicate that average favorable variances of 14.4% lead to upward ratcheting for targets no more difficult than 18.2% of peers' actual performance. Similarly, targets 10.9% easier than peers' performance lead to an upward target for average unfavorable variances of 16.9%.

[19] These authors find that well-performing firms reduce earnings targets if their managers fail to meet their prior-year targets but rarely increase earnings targets even if their managers exceed prior-year targets, and that poorly-performing firms commonly revise targets upwards if their managers exceed their prior-year targets but rarely decrease earnings targets otherwise. Well-performing can be equated with RTS > 0 and poorly-performing with RTS < 0.

[20] To better understand the informativeness of peers' performance in target setting, we ran a quantile regression, to explore the robustness of the results to the presence of outliers. The results were consistent to the ones reported in the paper.

prediction in this group is an asymmetric ratcheting behavior. We expect the opposite behavior for branches with challenging targets.

We use two alternative cutoff points at the 33rd and 66th percentiles, and 15th and 85th percentiles. Table 7 presents the results. The signs of coefficients λ_{+C}, λ_{+E}, λ_{-C}, and λ_{-E} are consistent with Table 6. Using the 33rd and 66th percentiles, asymmetry is significant and favorable variances have higher values of ratcheting coefficients than unfavorable variances for the easy target group. In particular, $(\lambda_{+} + \lambda_{+E}) - (\lambda_{+} + \lambda_{-} + \lambda_{-E})$ is different from zero ($F=8.91$, $p=0.03$). These results are comparable with the asymmetries reported in the literature (Leone and Rock 2002, and Bouwens and Kross 2011). Results using the 15th/85th cutoff points are stronger and in the same direction.

The ratcheting coefficients are not asymmetric for the medium RTS group. Managers do not treat favorable and unfavorable variances differently. Branches in this group see their targets increase or decrease 68% (using 33rd/66th percentiles) per percentage point of favorable or unfavorable variance.

For the challenging group the asymmetry is not significant ($(\lambda_{+} + \lambda_{+C}) - (\lambda_{+} + \lambda_{-} + \lambda_{-C})$ is not significantly different from zero) when the cutoff is set at 33rd/66th ($F=1.51$, $p=0.219$) but becomes significant for the 15th/85th percentiles ($F=5.23$, $p=0.022$). Asymmetry in ratcheting coefficients is present for both positive and negative values of RTS with a stronger effect on the latter side of the variable. The results suggest that the magnitude and asymmetry of ratcheting is associated with the information in RTS.

V. Conclusions

The results reported in the study contribute in various ways. First, they highlight the significance of RTS as a source of information in addition to past performance associated with ratcheting. The results indicate that the magnitude of RTS is comparable to the magnitude of ratcheting and therefore future research may want to better understand the role of peer groups in setting targets. The relevance of RTS to compensation also speaks to the

relative performance evaluation (RPE) literature. RPE is often designed into incentive contracts and these are often sticky across periods. In contrast, target setting is seldom formula-based and supervisors (principals) can change the weights on the different sources of information in every target setting cycle and across units. RTS facilitates including information of comparable units into the performance evaluation process. It does it *ex-ante* at the target setting process; this alternative benefits from the flexibility that subjectivity brings into the budgeting process.

Second, the results indicate that past performance and the performance of comparable responsibility centers are not independent sources of information but rather they provide information on each other. Their relevance to target setting depends on the magnitude of the other variable. This observation indicates that target setting is not a structured process (such as formula-based incentive systems); rather, managers weigh the various sources of information differently depending on the overall information set available to them. Thus, target setting is a subjective process but consistent with an information value framework. Our results are consistent with this prediction.

Third, the ratcheting has often been associated with asymmetric coefficients for favorable and unfavorable variances. Our results indicate that this asymmetry varies and even disappears as the information environment changes. The fact that asymmetry changes with the magnitude of RTS suggest that asymmetry is not an inherent property of incentive systems' design or the properties of the measures used in the contracting process, but rather it is the outcome of supervisors using the information set available to them.

The results offer a more complex picture of the target setting process that reflects the variety of sources of information available to supervisors. This process is of interest because subjectivity plays a significant role and supervisors can readily adapt their decisions (reflected in targets) to the information at their disposal. The research setting is one division within a company. As such, it allows for a research design that controls for a significant amount of

variables that are common across the division. This design increases the power of the tests. However, the results and especially the magnitudes of the various effects are particular to this setting and cannot be generalized. The results provide empirical evidence consistent with an information processing framework and therefore support the importance of understanding the information set available to managers in target setting processes.

The results open additional questions for future research. First, the asymmetry of the ratcheting is found to depend on the information available to the manager rather than being a characteristic of ratcheting in general. Previous explanations of this asymmetry were unrelated to information available to the manager who set targets. Second, target setting is a complex process, the paper identifies RTS as an additional dimension but other variables may also be relevant beyond past performance and peer group performance. Third, deviations from targets and relative performance can be relevant for setting new targets but also for resource allocation decisions. Again, resource allocation decisions may not only depend on these two variables but a broader set of variables.

The research setting is limited to one company and the results cannot be generalized to other settings. Rather, they are intended to provide evidence consistent with theoretical predictions associated with managers' use of information. Future research can extend the findings in the paper to other settings and investigate how alternative characteristics of the target setting process affect the relevance of past performance and relative target setting on future targets. This paper examines the relevance of RTS in addition to past performance as a relevant source of information for setting targets. In the same way, future work can also extend the sources of information in target setting beyond the past performance and RTS to include additional sources.

Appendix A
Test of Ratcheting and RTS using alternative specifications

Model (1)

$$(B_{i,t} - B_{i,t-1}) = \alpha_0 + \lambda_+ (A_{i,t-1} - B_{i,t-1}) + \lambda_- D_{i,t-1} (A_{i,t-1} - B_{i,t-1}) +$$
$$+ \alpha_1 \Delta Emp_{i,t} + \alpha_2 \Delta Comp_{n,t} + \alpha_3 Emp_{i,t-1} + \alpha_4 Mature_i + \alpha_5 Year\_04_i + \alpha_6 Year\_05_i + \alpha_7 Year\_06_i +$$
$$+ \sum \eta_j Z_j + \alpha_8 U_{i,t-1} + \varepsilon_{i,t}$$

Model (2)

$$(B_{i,t} - B_{i,t-1}) = \alpha_0 + \lambda_+ (A_{i,t-1} - B_{i,t-1}) + \lambda_- D_{i,t-1} (A_{i,t-1} - B_{i,t-1}) + \gamma\ RTS_{i,t-1} +$$
$$+ \alpha_1 \Delta Emp_{i,t} + \alpha_2 \Delta Comp_{n,t} + \alpha_3 Emp_{i,t-1} + \alpha_4 Mature_i + \alpha_5 Year\_04_i + \alpha_6 Year\_05_i + \alpha_7 Year\_06_i +$$
$$+ \sum \eta_j Z_j + \alpha_8 U_{i,t-1} + \varepsilon_{i,t}$$

Variable	Coefficient	Absolute specification Results Model (1)		Absolute specification Results Model (2)		Per employee specification Results Model (1)		Per employee specification Results Model (2)	
Intercept	α_0	128,854.4	***	79,439.85	***	61,140.95	***	40,219.72	***
		(9.43)		(5.79)		(10.20)		(7.01)	
$(A_{i,t-1} - B_{i,t-1})$	β_+	0.57	***	0.57	***	0.39	***	0.38	***
		(6.16)		(7.13)		(6.31)		(6.50)	
$D_{i,t-1}*(A_{i,t-1}-B_{i,t-1})/B_{i,t-1}$	β_-	-0.14		0.08		-0.23	***	-0.11	
		(-1.34)		(0.78)		(-3.14)		(-1.58)	
$RTS_{i,t-1}$	γ			-0.59	***			-0.25	***
				(-6.53)				(-8.11)	
$\Delta Emp_{i,t}$	α_1	75,956.43	***	101,702.7	***	-48,200.92	***	-41,466.74	***
		(5.72)		(7.08)		(-10.29)		(-9.06)	
$\Delta Comp_{x,t}$	α_2	-768.13	**	-824.79	**	-280.06	**	-284.67	**
		(2.26)		(-2.56)		(-2.27)		(-2.50)	
$Emp_{i,t-1}$	α_3	86.36		12,657.44	***	-3,049.77	**	2,285.53	
		(0.02)		(2.74)		(-2.07)		(1.52)	
Mature	α_4	-43,929.19	***	-20,853.69	***	-19,229.37	***	-9,733.14	***
		(-6.60)		(-3.20)		(-7.59)		(-3.94)	
$D_{i,t-1}$	α_8	-12,713.38		-7,159.32		-9,442.61	***	-10,775.38	***
		(-1.31)		(-0.84)		(-2.79)		(-3.48)	
N		1,105		1,105		1,105		1,105	
Adjusted R^2		64.81%		68.96%		64.85%		69.44%	

*, **, *** Statistically significant at 10%, 5% and 1% respectively. *t*-statistics are in parentheses.
$B_{i,t}$ = Budget performance (performance target) for year *t* for branch *i.* Guided Sales in Panel A and Guided Sales per employee in Panel B
$B_{i,t-1}$ = Budget performance (performance target) for year *t*-1 for branch *i.* Guided Sales in Panel A and Guided Sales per employee in Panel B
$A_{i,t-1}$ = Actual performance for year *t*-1 for branch *i.* Guided Sales in Panel A and Guided Sales per employee in Panel B
$D_{i,t-1}$ = 1 if $A_{i,t-1} < B_{i,t-1}$, 0 otherwise.
$\Delta Emp_{i,t}$ = Change in number of employees from year t-1 and year t.
$\Delta Comp_{x,t}$ = Change in #branches/million inhabitants from year *t*-1 to year *t* in geographic area *x*.
$Emp_{i,t-1}$ = Prior year's number of employees
Mature = 1 if branch *i* at time *t*-1 is 5 years old or older, 0 otherwise.
Year_0y = 1 if observation year corresponds to year 200y.
Zx = 1 if branch belongs to region x. These thirteen variables are included but not reported.

RTS = Relative target setting defined as $\dfrac{B_{i,t-1}/employees_{i,t-1} - (\sum_{j=1}^{n} A_{j,t-1}/employees_{j,t-1})/n}{(\sum_{j=1}^{n} A_{j,t-1}/employees_{j,t-1})/n}$

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Table 1
Incentive System for Branches

Estimation period: One year

Performance measures	**Weight**	**Thresholds and caps**
"Guided sales"	50%	None
Profit	50%	Less than 70% of the target: 0% of the bonus Between 70% and 100% of the target: linear; full bonus payout if it reaches 100% Between 100% and 130% of the target: linear up to 130% of full bonus payout Beyond 130% of the target: 130% of the full bonus payout
Non-financial performance measures	Associated with prizes and/or penalties	
Internal audit		Based on scales
Database management		Based on scales
Discounts		Proportional
Bad debt		Based on scales

Table 2

Sample Construction

	Years				
	2003	2004	2005	2006	Total
Number of offices with information available from the previous year: A_{t-1}- B_{t-1}	244	238	294	361	
Number of offices closed for which there is no information on the current year: B_t	7	4	11	9	
# Observations for the year	237	234	283	352	1,106
Number of offices opened during the year for which there is no information from the previous year: A_{t-1}- B_{t-1}	1	60	78	38	
Missing data					1
Final sample					**1,105**

Table 3
Mean Performance Standard and Variances

Panel A: Descriptive Statistics Over Time

(in €)	ACTUAL					BUDGET					$(A_t - B_t) > 0$	
Years	# of obs.	**Average** sales per branch	**Average** "Guided sales" per branch	**Percentage** "Guided sales" to total sales per branch	**Average** Increase in "guided sales"	# of obs.	**Average** Sales per branch	**Average** "Guided sales" per branch	**Percentage** "Guided sales" to total sales per branch	**Average** increase in "guided sales"	**Percentage** branches that exceeded "total sales" budget	**Percentage** branches that exceeded "guided sales" budget
2002	270	829,442	615,641	74.20%		244	962,010	647,596	67.61%		21.72%	46.72%
2003	267	959,849	713,427	74.19%	15.88%	238	1,048,802	748,013	71.65%	15.51%	36.97%	46.22%
2004	378	1,027,247	766,525	75.55%	7.44%	294	1,139,253	839,818	74.39%	12.27%	37.07%	50.68%
2005	403	1,055,075	794,078	75.95%	3.59%	361	1,242,436	934,474	76.06%	11.27%	24.93%	25.21%
2006	390	1,138,557	879,257	78.02%	10.73%	390	1,224,299	929,385	76.80%	-0.54%	38.46%	42.56%

Panel B: Descriptive Statistics of the Sample

Variable	Mean	Standard deviation	Q1	Median	Q3
$\mathbf{A}_t$	766,615	406,855	494,597	689,608	956,919
$\boldsymbol{B}_t$	840,329	406,005	580,131	754,141	1,024,311
$\mathbf{A}_t/\mathbf{AS}_t$	0.757	0.101	0.703	0.773	0.826
$\mathbf{B}_t/\mathbf{BS}_t$	0.739	0.086	0.690	0.748	0.801

$\mathbf{A}_t$ is actual "guided sales," $\mathbf{B}_t$ is budgeted "guided sales," $\mathbf{AS}_t$ is actual total sales, and $\mathbf{BS}_t$ is budgeted total sales.

Table 4
Descriptive Statistics for the Sample

Panel A: Relative Variables

Variable	Mean	Standard deviation	Q1	Median	Q3	Serial correlation
$(B_t - B_{t-1})/ B_{t-1}$	0.138	0.310	-0.020	0.100	0.230	0.141 ***
$(A_{t-1} - B_{t-1})/ B_{t-1}$	-0.040	0.203	-0.160	-0.040	0.080	0.250 ***
$(A_{t-1} - B_{t-1})/ B_{t-1}$ if $A_{t-1} > B_{t-1}$	0.144	0.155	0.050	0.100	0.190	0.158 ***
$(A_{t-1} - B_{t-1}) / B_{t-1}$ if $A_{t-1} < B_{t-1}$	-0.169	-0.139	-0.065	-0.130	-0.240	0.268 ***
RTS_{t-1}	0.053	0.261	-0.098	0.046	0.193	0.527 ***
$RTS_{t-1} * (A_{t-1} - B_{t-1}) / B_{t-1}$	-0.010	0.070	-0.021	-0.002	0.010	-
$\Delta Emp_t / Emp_{i,t-1}$	0.102	0.317	0.000	0.000	0.190	-
$\Delta Comp_t / Comp_{j,t-1}$	0.046	0.042	0.011	0.037	0.079	-

Panel B: Absolute Variables

Variable	Mean	Standard deviation	Q1	Median	Q3	Serial correlation
$(B_t - B_{t-1})$	71,101	166,795	-19,561	73,951	156,575	-0.012
$(A_t - B_t)$	-28,932	154,660	-120,145	-28,486	58,288	0.183 ***
$(A_{t-1} - B_{t-1})$ if $A_{t-1} > B_{t-1}$	104,934	116,572	33,539	75,935	135,577	0.279 ***
$(A_{t-1} - B_{t-1})$ if $A_{t-1} < B_{t-1}$	-122,951	-98,739	-51,141	-100,072	-173,937	0.083 ***
Absolute (RTS_{t-1})	13,182	71,066	-28,220	13,231	54,550	0.536 ***
Emp_{t-1}	2.61	1.01	2.00	2.50	3.00	-
ΔEmp_t	0.17	0.61	-0.08	0.06	0.45	-
$Comp_{t-1}$	340.97	140.65	245.89	325.92	392.58	-
$\Delta Comp_t$	12.81	14.17	4.03	12.77	24.09	-

*** Statistically significant at 1%

B_t is the "guided sales" target for the current year, B_{t-1} is the "guided sales" target for the previous year

RTS_{t-1} is the relative target setting defined as $\dfrac{B_{i,t-1} / employees_{i,t-1} - (\sum_{j=1}^{n} A_{j,t-1} / employees_{j,t-1}) / n}{(\sum_{j=1}^{n} A_{j,t-1} / employees_{j,t-1}) / n}$,

Absolute (RTS_{t-1}) is the relative target setting defined as $B_{i,t-1} / employees_{i,t-1} - (\sum_{j=1}^{n} A_{j,t-1} / employees_{j,t-1}) / n$,

Emp_{t-1} is employees in the previous year, ΔEmp_t is defined as $(Emp_{i,t} - Emp_{i,t-1})$, $Comp_{t-1}$ is the density of travel agencies' branches (number of branches divided per million inhabitants) in a region in the previous year and $\Delta Comp_t$ is the change in the density of agencies from the previous to the current year $(Comp_{j,t} - Comp_{j,t-1})$.

Table 5
Test of Ratcheting and Relative Target Setting

(1)

$$(B_{i,t} - B_{i,t-1})/B_{i,t-1} = \alpha_0 + \lambda_+(A_{i,t-1} - B_{i,t-1})/B_{i,t-1} + \lambda_- D_{i,t-1}(A_{i,t-1} - B_{i,t-1})/B_{i,t-1} +$$
$$+ \alpha_1 \Delta Emp_{i,t} + \alpha_2 \Delta Comp_{n,t} + \alpha_3 Emp_{i,t-1} + \alpha_4 Mature_i + \alpha_5 Year\_04_i + \alpha_6 Year\_05_i + \alpha_7 Year\_06_i +$$
$$+ \sum \eta_j Z_j + \alpha_8 U_{i,t-1} + \varepsilon_{i,t}$$

(2)

$$(B_{i,t} - B_{i,t-1})/B_{i,t-1} = \alpha_0 + \lambda_+(A_{i,t-1} - B_{i,t-1})/B_{i,t-1} + \lambda_- D_{i,t-1}(A_{i,t-1} - B_{i,t-1})/B_{i,t-1} + \gamma\ RTS_{i,t-1} +$$
$$+ \alpha_1 \Delta Emp_{i,t} + \alpha_2 \Delta Comp_{n,t} + \alpha_3 Emp_{i,t-1} + \alpha_4 Mature_i + \alpha_5 Year\_04_i + \alpha_6 Year\_05_i + \alpha_7 Year\_06_i +$$
$$+ \sum \eta_j Z_j + \alpha_8 U_{i,t-1} + \varepsilon_{i,t}$$

Variable	Coefficient	Predictions	Results Model (1)	Results Model (2)
Intercept	α_0	?	0.42 ***	0.28 ***
			(8.63)	(8.08)
$(A_{i,t-1} - B_{i,t-1})/ B_{i,t-1}$	λ_+	+	0.96 ***	0.73 ***
			(8.83)	(7.34)
$D_{i,t-1} * (A_{i,t-1} - B_{i,t-1})/ B_{i,t-1}$	λ_-	-	-0.63 **	-0.38 *
			(-2.44)	(-1.78)
$RTS_{i,t-1}$	γ	-		-0.51 ***
				(-8.54)
$\Delta Emp_{i,t}$	α_1	+	0.22 ***	0.42 ***
			(4.05)	(8.15)
$\Delta Comp_{n,t}$	α_2	-	0.32	0.09
			(1.39)	(-0.43)
$Emp_{i,t-1}$	α_3	?	-0.07 ***	-0.02 **
			(-6.37)	(-2.53)
Mature	α_4	?	-0.13 ***	-0.05 ***
			(-9.11)	(-4.64)
$D_{i,t-1}$	α_8	?	-0.03	-0.02
			(-0.95)	(-0.59)
N			1,105	1,105
Adjusted R^2			46.62%	58.70%

*, **, *** Statistically significant at 10%, 5% and 1% respectively. *t*-statistics are in parentheses.
$B_{i,t}$ = Budget performance (performance target) for year *t* for branch *i.*
$B_{i,t-1}$ = Budget performance (performance target) for year *t*-1 for branch *i.*
$A_{i,t-1}$ = Actual performance for year *t*-1 for branch *i.*
$D_{i,t-1}$ = 1 if $A_{i,t-1} < B_{i,t-1}$, 0 otherwise.
$\Delta Emp_{i,t}$ = Relative change in number of employees from year t-1 and year t. i.e., $(Emp_{i,t} - Emp_{i,t-1})/Emp_{i,t-1}$
$\Delta Comp_{j,t}$ = Relative change in #branches/Millions of habitants from year *t*-1 to year *t* in geographic area *x*. i.e., $(Comp_{j,t} - Comp_{j,t-1})/Comp_{j,t-1}$
$Emp_{i,t-1}$ = Prior year's number of employees.
Mature = 1 if branch *i* at time *t*-1 is 5 years old or older, 0 otherwise.
Year_0x = 1 if observation year corresponds to year 200x. These three variables are included but not reported.
Zx = 1 if branch belongs to region x. These thirteen variables are included but not reported.

RTS = Relative target setting defined as $\dfrac{B_{i,t-1}/employees_{i,t-1} - (\sum_{j=1}^{n} A_{j,t-1}/employees_{j,t-1})/n}{(\sum_{j=1}^{n} A_{j,t-1}/employees_{j,t-1})/n}$

Table 6

Relative Target Setting and the Magnitude of Ratcheting

(3)

$$(B_{i,t} - B_{i,t-1})/B_{i,t-1} = \alpha_0 + \lambda_+(A_{i,t-1} - B_{i,t-1})/B_{i,t-1} + \lambda_- D_{i,t-1}(A_{i,t-1} - B_{i,t-1})/B_{i,t-1} + \gamma\ RTS_{i,t-1} +$$
$$+ \phi_+ RTS_{i,t-1} * (A_{i,t-1} - B_{i,t-1})/B_{i,t-1} + \phi_- RTS_{i,t-1} * D_{i,t-1}(A_{i,t-1} - B_{i,t-1})/B_{i,t-1} +$$
$$+ \alpha_1 \Delta Emp_{i,t} + \alpha_2 \Delta Comp_{n,t} + \alpha_3 Emp_{i,t-1} + \alpha_4 Mature_{i} + \alpha_5 Year\_04_{i} + \alpha_6 Year\_05_{i} + \alpha_7 Year\_06_{i} +$$
$$+ \sum \eta_j Z_j + \alpha_8 U_{i,t-1} + \varepsilon_{i,t}$$

Variable	Coefficient	Predictions	Results Model (3)	
Intercept	α_0	?	0.28	***
			(7.61)	
$(A_{i,t-1} - B_{i,t-1}) / B_{i,t-1}$	λ_+	+	0.56	***
			(5.41)	
$D_{i,t-1} * (A_{i,t-1} - B_{i,t-1})/ B_{i,t-1}$	λ_-	-	-0.23	
			(-1.31)	
$RTS_{i, t-1}$	γ	-	-0.26	**
			(-2.87)	
$RTS_{i, t-1} * (A_{i,t-1} - B_{i,t-1}) / B_{i,t-1}$	ϕ_+	-	-1.27	***
			(-3.89)	
$RTS_{i, t-1} * D_{i,t-1} (A_{i,t-1} - B_{i,t-1}) / B_{i,t-1}$	ϕ_-	+	2.77	***
			(3.24)	
$\Delta Emp_{i,t}$	α_1	+	0.42	***
			(8.41)	
$\Delta Comp_{i,t}$	α_2	-	0.02	
			(-0.11)	
$Emp_{i,t-1}$	α_3	?	-0.02	**
			(-2.88)	
Mature	α_4	?	-0.04	***
			(-3.58)	
$D_{i,t-1}$	α_8	?	-0.04	*
			(-1.74)	
N			1,105	
Adjusted R^2			63.01%	

*, **, *** Statistically significant at 10%, 5% and 1% respectively. *t*-statistics are in parentheses.
$B_{i,t}$ = Budget performance (performance target) for year *t* for branch *i.*
$B_{i,t-1}$ = Budget performance (performance target) for year *t*-1 for branch *i.*
$A_{i,t-1}$ = Actual performance for year *t*-1 for branch *i.*
$D_{i,t-1}$ = 1 if $A_{i,t-1} < B_{i,t-1}$, 0 otherwise.
$\Delta Emp_{i,t}$ = Relative change in number of employees from year t-1 and year t. i.e., $(Emp_{i,t} - Emp_{i,t-1})/Emp_{i,t-1}$
$\Delta Comp_{j,t}$ = Relative change in #branches/million inhabitants from year *t*-1 to year *t* in geographic area *x*. i.e., $(Comp_{j,t} - Comp_{j,t-1})/Comp_{j,t-1}$.
$Emp_{i,t-1}$ = Prior year's number of employees.
Mature = 1 if branch *i* at time *t*-1 is 5 years old or older, 0 otherwise.
Year_0x = 1 if observation year corresponds to year 200x. These three variables are included but not reported
Zx = 1 if branch belongs to region x. These thirteen variables are included but not reported.

RTS = Relative target setting defined as $\dfrac{B_{i,t-1}/employees_{i,t-1} - (\sum_{j=1}^{n} A_{j,t-1}/employees_{j,t-1})/n}{(\sum_{j=1}^{n} A_{j,t-1}/employees_{j,t-1})/n}$

Table 7
The Effect of RTS on the asymmetry of Ratcheting

Model (4)

$$(B_{i,t} - B_{i,t-1}) / B_{i,t-1} = \alpha_0 + \lambda_+ (A_{i,t-1} - B_{i,t-1}) / B_{i,t-1} + \lambda_{+C} C_{i,t-1} (A_{i,t-1} - B_{i,t-1}) / B_{i,t-1} + \lambda_{+E} E_{i,t-1} (A_{i,t-1} - B_{i,t-1}) / B_{i,t-1} +$$
$$+ \lambda_- D_{i,t-1} (A_{i,t-1} - B_{i,t-1}) / B_{i,t-1} + \lambda_{-C} C_{i,t-1} D_{i,t-1} (A_{i,t-1} - B_{i,t-1}) / B_{i,t-1} + \lambda_{-E} E_{i,t-1} D_{i,t-1} (A_{i,t-1} - B_{i,t-1}) / B_{i,t-1} +$$
$$+ \alpha_1 \Delta Emp_{i,t} + \alpha_2 \Delta Comp_{n,t} + \alpha_3 Emp_{i,t-1} + \alpha_4 Mature_i + \alpha_5 Year\_04_i + \alpha_6 Year\_05_i + \alpha_7 Year\_06_i +$$
$$+ \sum \eta_j Z_j + \alpha_8 D_{i,t-1} + \alpha_9 C_{i,t-1} + \alpha_{10} E_{i,t-1} + \varepsilon_{i,t}$$

Variable	Coefficient	Predictions	33 and 66 percentiles Results Model (4)	15 and 85 percentiles Results Model (4)
Intercept	α_0	?	0.35 ***	0.33 ***
			(8.62)	(9.19)
$(A_{i,t-1} - B_{i,t-1})/B_{i,t-1}$	λ_+	+	0.68 ***	0.66 ***
			(6.38)	(8.74)
$C_{i,t-1} * (A_{i,t-1} - B_{i,t-1})/ B_{i,t-1}$	λ_{+C}	-	-0.08	-0.23 *
			(-0.63)	(-1.73)
$E_{i,t-1} * (A_{i,t-1} - B_{i,t-1})/ B_{i,t-1}$	λ_{+E}	+	0.52 ***	0.62 ***
			(2.61)	(3.19)
$D_{i,t-1} * (A_{i,t-1} - B_{i,t-1})/ B_{i,t-1}$	λ_-	-	-0.04	-0.03
			(-0.25)	(-0.32)
$C_{i,t-1} * D_{i,t-1} * (A_{i,t-1} - B_{i,t-1})/ B_{i,t-1}$	λ_{-C}	+	0.25	0.46 **
			(1.22)	(2.44)
$E_{i,t-1} * D_{i,t-1} * (A_{i,t-1} - B_{i,t-1})/ B_{i,t-1}$	λ_{-E}	-	-1.38 ***	-1.75 ***
			(-2.68)	(-3.24)
$D_{i,t-1}$	α_8	?	0.01	0.03
			(0.27)	(0.23)
$C_{i,t-1}$	α_9	?	-0.03	-0.04 **
			(-1.34)	(-2.25)
$E_{i,t-1}$	α_{10}	?	0.02	0.09 ***
			(0.04)	(2.61)
n			1,105	1,105
Adjusted R^2			53.30%	56.58%

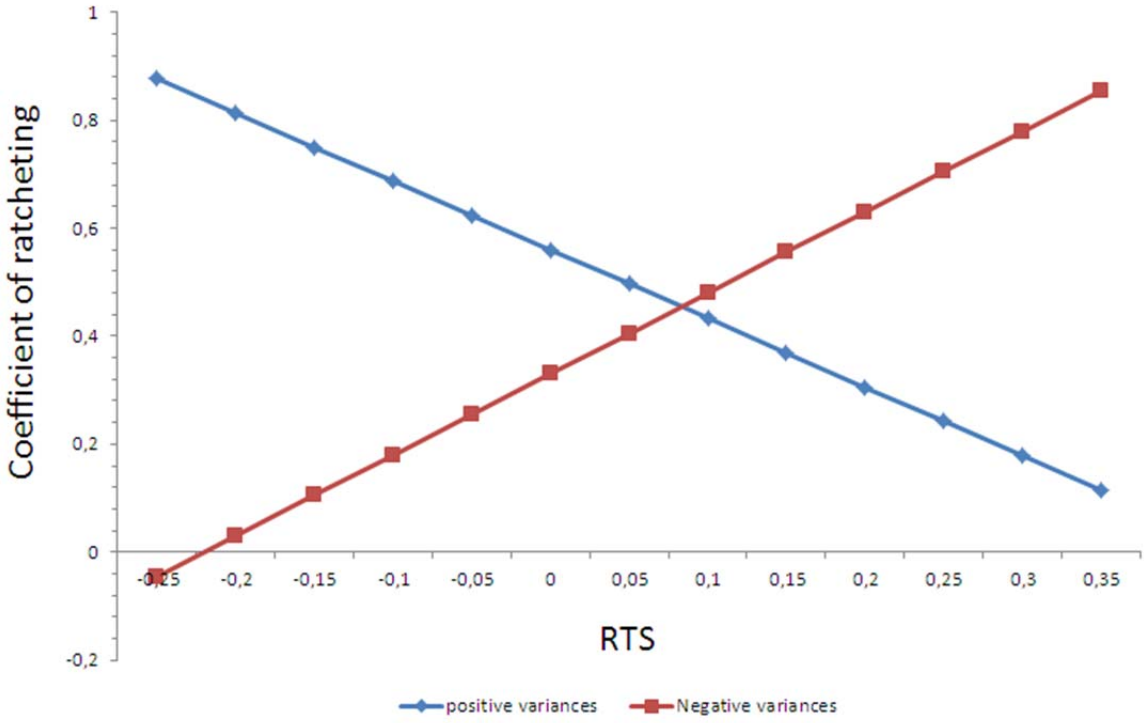
*, **, *** Statistically significant at 10%, 5% and 1% respectively. *t*-statistics are in parentheses.

$B_{i,t}$ = Budget performance (performance target) for year *t* for branch *i*. $B_{i,t-1}$ = Budget performance (performance target) for year *t*-1 for branch *i*. $A_{i,t-1}$ = Actual performance for year *t*-1 for branch *i*.

$D_{i,t-1}$ = 1 if $A_{i,t-1} < B_{i,t-1}$, 0 otherwise. $C_{i,t-1}$ = Challenging targets. 1 if RTS in the upper 33-percentile, and zero otherwise in the first column and 1 if RTS in the upper 15-percentile and zero otherwise in the second column. $E_{i,t-1}$ = Easy targets. 1 if RTS in the lower 33-percentile, and zero otherwise in the first column and 1 if RTS in the lower 15-percentile and zero otherwise in the second column. Variables included but not reported: $\Delta Emp_{i,t}$; $\Delta Comp_{j,t}$; $Emp_{i,t-1}$;Mature; Year_0x; Zx, defined as in Table 6.

RTS = Relative target setting defined as $\dfrac{B_{i,t-1}/employees_{i,t-1} - (\sum_{j=1}^{n} A_{j,t-1}/employees_{j,t-1})/n}{(\sum_{j=1}^{n} A_{j,t-1}/employees_{j,t-1})/n}$

Figure 1
The Effect of RTS on the Level of Ratcheting for Favorable and Unfavorable Variances



This figure plots the relative change in ratcheting coefficients with respect to RTS, based on the results reported on Table 6 (Model 3)