

e - c o m p a n i o n

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Electronic Companion—"An Empirical Examination of Goals and Performance-to-Goal Following the Introduction of an Incentive Bonus Plan with Participative Goal Setting" by Shannon W. Anderson, Henri C. Dekker, and Karen L. Sedatole, *Management Science*, doi 10.1287/mnsc.1090.1088.

ONLINE APPENDIX

This appendix provides information on the validity of the independent variables and analysis of the sensitivity of the reported results to alternative measures of the theoretical constructs.

A.1. Measurement and testing of the effects of Career Horizon on Goals

As noted in the text, we measure career horizon as a 7-category variable that indicates the approximate number of years until the SM expects to retire. Since, in a separate question, SMs indicate little or no intention to separate from HKS, the number of years until retirement is a reasonable proxy for the manager's horizon with the firm. The question then is whether career horizon is confounded with other theoretical constructs in a manner that would introduce multi-collinearity or otherwise jeopardize inferences of the tests.

A natural concern is that career horizon may be related to SM job tenure (our proxy for local store knowledge) and economic dependence in ways that would diminish the precision of coefficient estimates (i.e., multi-collinearity problems). If, for example, SM job tenure is closely related to the total number of years that the manager has worked, then one would expect the two to be negatively correlated at a high level simply because the total number of years of a manager's career is circumscribed by typical U.S. employment patterns. Similarly, if economic dependence is closely related to wealth, then retirement plans may be linked to wealth accumulation. Fortunately, in HKS neither of these conditions exists. As the correlation table in this appendix, Table A-1, indicates, career horizon is virtually uncorrelated (-0.08 and 0.01) with measures of local store knowledge (store manager job tenure) and economic dependence. Moreover, as we report in the paper, there is no evidence from the variance inflation factors of auxiliary regression analysis that multi-collinearity poses a serious problem to coefficient interpretation. Because SM job tenure is distinct from either years of employment with the company or years of employment in the retail industry (both of which have a stronger negative correlation, -0.15 and -0.33 respectively, with career horizon as predicted), there is no mathematical identity that links SM job tenure and career horizon. Moreover, because we assess the share of household income provided by the manager's salary without regard to size of household, wealth or expenditure levels, economic dependence measures only

the differential impact of bonuses on a manager's household annual income. Thus it is unlikely to correlate with accumulated wealth, a theoretical construct that would be more likely to be related to career horizon.

We hypothesize in H4a that managers with longer career horizons exert greater slack-building effort both because of the long-term consequences of higher goals to bonus payments and because of the possibility that goal attainment is more important for those who are candidates for promotion. However, there are few theoretical guidelines for determining what constitutes the short and long term. Stated differently, the functional form that relates career horizon to returns to slack-building is unknown and the approximately linear relation that we test is only one possibility. A plausible alternative is that the effect of career horizon may only be diminished in the years very near retirement. To explore this possibility, we replace our categorical (and more continuous) measure of career horizon with an indicator variable to distinguish SMs who are more than ten years away from retirement. We find that the results are qualitatively unchanged; specifically, that after introduction of the plan, managers that are further from retirement are more likely to obtain lower goals. We interpret this as evidence that these managers have a greater incentive to engage in slack-building and are successful in their efforts after participative goal-setting is instituted.

A.2. Measurement and testing of the effects of SM local store knowledge on Goals

As noted in the text, we measure local store knowledge with SM Job Tenure, a 7-category variable that indicates the approximate number of years that the manager has been an SM for HKS. Tenure as a store manager proxies for the SM's local knowledge and information asymmetry that favors the SM in goal setting. Clearly tenure as SM is limited as a measure of an SM's stock of relevant store knowledge; consequently, we performed extensive tests to assess the extent to which SM job tenure might represent different theoretical constructs. As an initial validity check, we compare SM job tenure with responses to a survey in which DM's were asked directly about information asymmetry. Specifically, for each of their SMs, the DM was asked whether they were more or less knowledgeable than the SM about how best to enhance store profitability. Although missing DM surveys meant that only 45 of the SMs were evaluated,

the correlation between DM's claimed superiority in enhancing store profits and SM job tenure is -0.41 ($p < 0.01$). A concern of course is whether the DM would be biased toward claiming greater knowledge, since this is effectively self-reported performance; nonetheless, it appears that even this potentially biased measure provides support for the use of SM job tenure as a proxy for local knowledge and information asymmetry that favors the SM in goal setting.

Perhaps the greatest threat to the validity of SM job tenure as a measure of local store knowledge giving rise to information asymmetry is the concern that it measures competence instead of, or in addition to local store knowledge. We posit that local store knowledge favors the SM in setting lower goals with greater slack. However, SM job tenure could also be associated with competence that either (i) provides the manager with credibility in goal-setting discussions (facilitating increased slack-building), and/or (ii) leads the DM to demand more of more tenured managers (mitigating slack). While the former suggests a negative relation between SM job tenure and post-plan goals (consistent with H4b), the latter suggests a positive relation (and, therefore, works against our hypothesis). The challenge in assessing this measurement vulnerability is obtaining a reliable independent measure of competence. For this validity check, we employ survey data in which the DM was asked to evaluate each of their SMs. For the 45 SMs for which these data are available, we find a positive correlation between SM job tenure and the DM's assessment of the SM's competence ($r = 0.34$; $p < 0.01$) and whether he is one of the best SMs ($r = 0.32$; $p < 0.01$). Although these correlations are slightly lower than the correlation with the direct assessment of information asymmetry, there is nonetheless evidence that SM job tenure confounds both information asymmetry and expertise or capability.

In this situation, the best way to distinguish the separate effects of information asymmetry and manager competence is to include both SM job tenure and DM assessment of SM competence in the analysis. When we do so, for the sharply reduced sample of 45 SMs, we find that the results of Table 3 are qualitatively unchanged. Specifically, SM job tenure continues to be significantly ($p < 0.01$) negatively associated with goals after introduction of the plan, consistent with theory that information asymmetry that favors the SM will lead to lower goals. However, SM competence as judged by the DM is

associated with significantly ($p < 0.05$) higher goals after introduction of the plan, consistent with the explanation that more is expected of more capable managers. We do not report these results in the body of the paper owing to the much smaller sample size; nonetheless, this ancillary analysis provides support for the validity of SM job tenure as a measure of local store knowledge and information asymmetry that favors SMs in goal setting discussions with DMs.

We hypothesize that it is knowledge of local store-specific conditions that creates information asymmetry between the SM and DM that favors the more knowledgeable SMs in goal setting (relative to less tenured SMs). However, an argument may also be made that any work experience with the firm is a valid basis for information asymmetry (particularly if the SM was promoted within a store in which he previously worked, a common phenomena). We explore this possibility by replacing SM job tenure by a measure of total years of firm employment (correlation with SM job tenure = 0.69; $p < 0.01$). The results are qualitatively the same as reported in the text; that is, more experience with the firm is associated with lower goals. If we add to this analysis a measure of prior retail experience outside HKS, industry experience also provides a marginally significant negative interaction with Plan ($p < 0.10$), indicating that, similar to longer HKS tenure, SMs with more outside experience receive lower sales goals after plan implementation. When the above analyses are augmented to include the measure of SM competence as judged by the DM, the results are qualitatively unchanged, with knowledge of retail operations associated with lower goals and managerial competence as judged by the DM associated with higher goals after the plan was introduced.

A.3.Potential confounds with Store Characteristics and SM Job Tenure and Career Horizon

In the two earlier sections we considered the measurement and meaning of the SM Career Horizon and Job Tenure variables and their potential relationships with one another. In this section we consider the possibility that these variable measures are confounded with store characteristics, specifically, with differences between new versus existing stores or, more generally, store growth. A concern in field-based research that is typically controlled in experimental studies is that managers are not randomly assigned to stores. Specifically, it is plausible that better managers are placed in more challenging environments,

which in our setting is often the opening of new stores. Inconsistent with this logic, the correlations in Table A-2 between SM Job Tenure and Career Horizon, and the measures, Store Age and New Store, indicate these are largely unrelated. Only Career Horizon shows a weak correlation (0.11) with Store Age. When we investigated this with the Director of Strategic Planning she pointed out that it is virtually impossible to transfer store managers outside of their current geographic region owing to the relatively modest salaries of SMs and the costs of relocation. As a result, the “selection effect” of placing better managers in new stores is only operative at the margin, within a region at best, and not for the full pool of SMs. Indeed, univariate correlations between SM Job Tenure and Career Horizon and the other store and market demographic characteristics range between 0.00 and -0.26. In addition, new store openings affect a modest portion of the observations; as Table A-1 indicates, only 7% (i.e., 27 quarterly observations out of 405, which relate to 14 stores and 15 SMs) of all sample observations has a value of one on the new store indicator, indicating the store has been open less than one year (10 observations in the pre-plan period and 17 observations in the post-plan period). Although the limited number of new store observations is unlikely to substantially affect our model estimates, we include a variable to control for effects of store age measured both in days (Store Age) and as a ‘New Store’ indicator variable to control for growth and start-up effects (i.e., lower sales and goals) in all analyses reported in the study.

We also repeated the analyses after excluding the new store observations (i.e., cases where New Store = 1), and find that the results are unchanged and, in fact, increase in significance. The Plan coefficient reported in Table 2, Panel B for the PtoG model is 0.48 ($t = 2.32$, $p < 0.05$), and without the 27 new store observations is 0.60 ($t = 2.93$; $p < 0.01$). This results from an increased difference between the Plan coefficients resulting from a larger negative coefficient on Plan in the Goal Level model (i.e., -0.50, $t = -7.57$ vs. -0.49, $t = -7.45$) and a smaller negative coefficient on Plan in the Sales Level model (i.e., -0.42, $t = -6.48$ vs. -0.43, $t = -6.54$). In sum, we conclude that for our research setting SM Job Tenure and Career Horizon are not significantly confounded with the store characteristics that are included as control variables in our model.

A.4.Examination of goal ratcheting variant of H5

In the text we document a significant positive interaction between Prior Year PtoG and Plan (supporting H5). We conclude that after plan implementation, prior PtoG information is increasingly used during goal setting. The influence of this information is insignificant for the pre-plan period when forecasts were developed using econometric time series modeling primarily based on historical sales information. In this section we further explore an asymmetric (i.e., “ratcheting”) variant of hypothesis H5 (Weitzman 1980) by examining whether positive PtoG outcomes result in goal increases that are larger than goal decreases associated with negative PtoG outcomes (Leone and Rock 2002). In an untabulated analysis we multiply the two prior performance interaction terms, Prior Qtr PtoG*Plan and Prior Yr PtoG*Plan, with indicator variables denoting whether the associated prior performance variable is positive and negative.

On the one hand, we find no difference between coefficients for prior year performance; the relation between goals and Prior Yr PtoG is positive and of similar magnitude regardless of whether or not the manager exceeds or falls short of the goal. Moreover, the negative association between current and past PtoG that would be expected under goal ratcheting is not observed. As a robustness check, we repeated the analysis with subsamples of observations in the upper or lower third of the PtoG distribution (N=183). This excludes observations in the middle of the distribution where classification of prior PtoG may be somewhat arbitrary owing to very small differences from zero. Conclusions are qualitatively similar.

On the other hand, the post-plan association between goals and Prior Qtr PtoG does differ depending on the sign of Prior Qtr PtoG. The association is positive for managers whose performance exceeded goals in the prior quarter and negative for managers whose performance fell short of goals. These offsetting effects yield an insignificant net effect in Table 3. Thus, goals increase in the magnitude by which prior quarter performance exceeds *or falls short* of the goal. While this provides evidence of an asymmetric relation between prior quarter performance and current goals, the asymmetry is not consistent with ratcheting.

Unique Appendix References (for all others see text)

Leone, A. J. and S. Rock. 2002. Empirical tests of budget ratcheting and its effect on managers' discretionary accrual choices. *Journal of Accounting & Economics* 33 (1): 43-67.

Table A-1: Descriptive Statistics**Panel A:** Distributions of panel data with repeated observations

	N	MEAN	STD	MIN	MAX
<i>Dependent Variables</i>					
PtoG	405	-0.15	1.65	-5.15	5.25
Sales ^a	405	3.88	1.15	1.56	7.68
Sales Goal ^a	405	3.89	1.16	1.53	7.77
<i>Independent Variables</i>					
Plan	405	0.59	0.49	0.00	1.00
Career Horizon	405	6.05	1.08	3.00	7.00
Local Store Knowledge (SM Job Tenure)	405	2.83	0.99	1.00	5.00
Dependence	405	3.70	0.87	2.00	5.00
Prior Qtr PtoG	405	1.64 E-03	0.05	-0.21	0.23
Prior Yr PtoG	405	-2.18 E-03	0.05	-0.25	0.29
<i>Retail Industry Control Variable</i>					
Industry Sales	405	3,551	357	2,912	4,141
<i>Store and Market Control Variables</i>					
Cannibalize	405	2.03	5.41	0.00	25.00
Store Age	405	2,478	1,477	184	8277
New Store	405	0.07	0.25	0.00	1.00
SM store change	405	0.04	0.21	0.00	1.00
Store Size	405	49,988	5,511	35,671	65,605
Num HH	405	401.1	70.5	280.0	633.7
HH Income	405	43,282	10,062	26,054	69,145
%Fam Kids	405	3.86	1.28	1.58	7.82

^a For reasons of confidentiality we scale the sales and sales goals by a common arbitrary factor. The reported values are meaningful only in that they indicate the similarity of distribution of both measures.

Panel B: Distributions of variables that vary only with time (N=10), store (N=59) or SM (N=61)

	N	MEAN	STD	MIN	MAX
<i>Independent Variables</i>					
Career Horizon	61	6.03	1.12	3.00	7.00
Local Store Knowledge (SM Job Tenure)	61	2.64	1.07	1.00	5.00
Dependence	61	3.72	0.88	2.00	5.00
<i>Retail Industry Control Variable</i>					
Industry Sales	10	3,499	379	2,912	4,141
<i>Store and Market Control Variables</i>					
Store Size	59	50,710	6,627	35,671	65,605
Num HH (sqrt)	59	408.15	74.3	280.0	633.7
HH Income	59	44,057	10,142	26,054	69,145
%Fam Kids (sqrt)	59	4.00	1.33	1.58	7.82

Table A-2: Pearson Correlations of Variables
(n=405, *p-values* in italics)

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.
1. PtoG																	
2. Sales	0.06 <i>0.25</i>	1.00															
3. Sales Goal	-0.09 <i>0.08</i>	0.99 <i>0.00</i>	1.00														
4. Plan	0.05 <i>0.36</i>	-0.06 <i>0.26</i>	-0.06 <i>0.21</i>	1.00													
5. Prior Qtr PtoG	0.20 <i>0.00</i>	0.13 <i>0.01</i>	0.13 <i>0.01</i>	-0.14 <i>0.00</i>	1.00												
6. Prior Yr PtoG	0.00 <i>0.93</i>	0.04 <i>0.47</i>	0.01 <i>0.87</i>	-0.10 <i>0.04</i>	0.17 <i>0.00</i>	1.00											
7. Career Horizon	-0.07 <i>0.17</i>	0.05 <i>0.30</i>	0.06 <i>0.22</i>	-0.03 <i>0.52</i>	-0.04 <i>0.37</i>	-0.07 <i>0.18</i>	1.00										
8. Local Store Know (SM Job Tenure)	0.03 <i>0.56</i>	0.47 <i>0.00</i>	0.47 <i>0.00</i>	-0.27 <i>0.00</i>	0.02 <i>0.65</i>	0.08 <i>0.09</i>	-0.08 <i>0.10</i>	1.00									
9. Dependence	0.04 <i>0.46</i>	-0.03 <i>0.56</i>	-0.03 <i>0.49</i>	0.04 <i>0.43</i>	0.07 <i>0.17</i>	0.02 <i>0.71</i>	0.01 <i>0.85</i>	-0.10 <i>0.05</i>	1.00								
10. Industry Sales	-0.03 <i>0.60</i>	0.14 <i>0.00</i>	0.15 <i>0.00</i>	0.64 <i>0.00</i>	0.04 <i>0.41</i>	-0.06 <i>0.20</i>	-0.03 <i>0.55</i>	-0.19 <i>0.00</i>	0.02 <i>0.65</i>	1.00							
11. Cannibalize	-0.21 <i>0.00</i>	-0.09 <i>0.08</i>	-0.06 <i>0.26</i>	0.06 <i>0.25</i>	-0.07 <i>0.16</i>	-0.23 <i>0.00</i>	0.09 <i>0.08</i>	-0.11 <i>0.02</i>	0.07 <i>0.18</i>	0.02 <i>0.66</i>	1.00						
12. Store Age	-0.17 <i>0.00</i>	0.28 <i>0.00</i>	0.30 <i>0.00</i>	0.12 <i>0.01</i>	-0.13 <i>0.01</i>	-0.24 <i>0.00</i>	0.11 <i>0.02</i>	-0.02 <i>0.65</i>	-0.06 <i>0.23</i>	0.09 <i>0.08</i>	0.13 <i>0.01</i>	1.00					
13. New Store	0.11 <i>0.03</i>	-0.11 <i>0.03</i>	-0.12 <i>0.01</i>	-0.12 <i>0.02</i>	-0.02 <i>0.62</i>	0.20 <i>0.00</i>	0.00 <i>0.93</i>	0.05 <i>0.36</i>	0.08 <i>0.11</i>	-0.06 <i>0.19</i>	-0.01 <i>0.83</i>	-0.33 <i>0.00</i>	1.00				
14. SM store change	-0.06 <i>0.22</i>	-0.12 <i>0.01</i>	-0.12 <i>0.02</i>	0.06 <i>0.23</i>	0.03 <i>0.53</i>	-0.06 <i>0.20</i>	-0.04 <i>0.37</i>	-0.16 <i>0.00</i>	0.01 <i>0.92</i>	-0.07 <i>0.19</i>	0.03 <i>0.61</i>	-0.04 <i>0.40</i>	-0.01 <i>0.85</i>	1.00			
15. Store Size	0.15 <i>0.00</i>	0.17 <i>0.00</i>	0.15 <i>0.00</i>	0.05 <i>0.31</i>	0.05 <i>0.33</i>	0.19 <i>0.00</i>	-0.14 <i>0.00</i>	0.01 <i>0.77</i>	0.12 <i>0.02</i>	0.05 <i>0.32</i>	-0.07 <i>0.15</i>	-0.56 <i>0.00</i>	0.29 <i>0.00</i>	0.03 <i>0.49</i>	1.00		
16. Num HH	-0.12 <i>0.01</i>	-0.05 <i>0.31</i>	-0.03 <i>0.51</i>	0.04 <i>0.47</i>	-0.06 <i>0.25</i>	-0.11 <i>0.03</i>	0.15 <i>0.00</i>	-0.26 <i>0.00</i>	0.00 <i>0.96</i>	0.02 <i>0.76</i>	0.30 <i>0.00</i>	0.23 <i>0.00</i>	-0.08 <i>0.12</i>	0.12 <i>0.01</i>	-0.10 <i>0.05</i>	1.00	
17. HH Income	0.00 <i>0.99</i>	-0.17 <i>0.00</i>	-0.17 <i>0.00</i>	0.06 <i>0.23</i>	-0.06 <i>0.20</i>	0.01 <i>0.78</i>	-0.13 <i>0.01</i>	0.08 <i>0.09</i>	-0.14 <i>0.00</i>	0.05 <i>0.29</i>	-0.01 <i>0.90</i>	-0.04 <i>0.40</i>	-0.05 <i>0.31</i>	0.03 <i>0.51</i>	-0.04 <i>0.38</i>	0.09 <i>0.08</i>	1.00
18. %Fam Kids	-0.01 <i>0.79</i>	0.05 <i>0.36</i>	0.05 <i>0.34</i>	-0.01 <i>0.90</i>	-0.02 <i>0.74</i>	0.00 <i>0.96</i>	-0.05 <i>0.31</i>	0.04 <i>0.46</i>	-0.15 <i>0.00</i>	0.02 <i>0.75</i>	0.01 <i>0.80</i>	0.04 <i>0.48</i>	0.02 <i>0.69</i>	0.06 <i>0.24</i>	0.16 <i>0.00</i>	0.08 <i>0.10</i>	0.23 <i>0.00</i>

Figures A1-A2: Standardized residual sales goals and sales

These graphs display the difference between the observed sales goals and sales and regression predicted sales goals and sales, which include industry sales growth (ICSC), cannibalization and new store as time-covarying predictors (note Q6 = first quarter of new plan). Both graphs show that after plan implementation, the observed sales goals and sales levels are below the model-predicted goals and sales.

Figure A1: Standardized residual sales goal (observed sales goal – predicted sales goal Q1 – Q10)

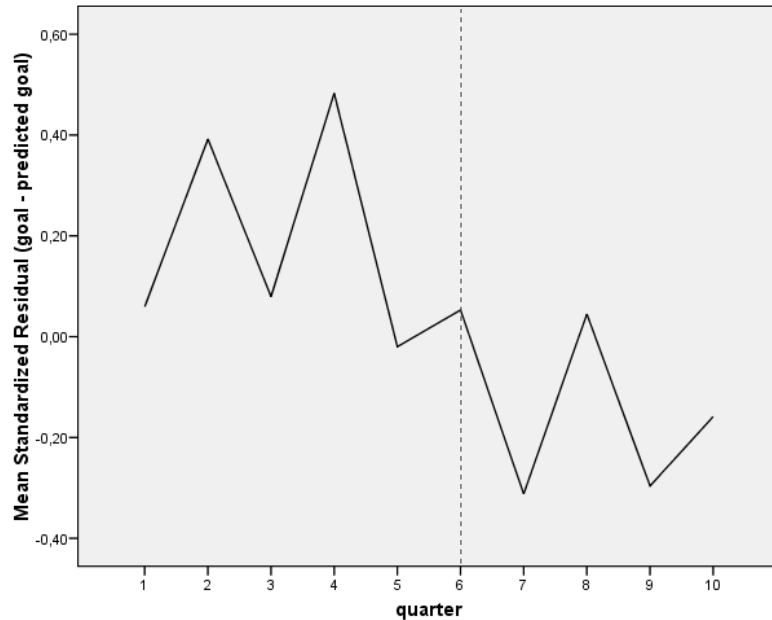


Figure A2: Standardized residual sales (observed sales – predicted sales) Q1 – Q10

