Goals and Governance, Complements or Substitutes? Both!:

A study of performance in government organizations

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13. Strategic Management
Competitive Session

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***ABSTRACT**: We investigate organizational performance by considering the influence of goals and governance, both directly and interactively. Specifically, we theorize a linear relationship regarding goal importance and a curvilinear relationship regarding the degree of formalization of operational-level governance. We test our model on 348 Information Technology professionals in a large American government organization. We find support for our hypotheses and we find that goals and governance are substitutes in the condition of low to moderate governance, and are complements in the condition of moderate to high governance. While our theory is constrained to goals with high group-efficacy, our provocative findings contribute to both scholarly literature and managerial practice. Firms that select governance systems based on the characteristics of the organization's goals may achieve better performance.*

Keywords: Strategy; Strategy process; Strategy execution; Business level strategy

Research on the impact of organizational goals on firm performance has long been a centerpiece of management theory (Cyert & March, 1963; Taylor, 1911) and strategic management theory (Ansoff, 1979; Fiegenbaum, Hart, & Schendel, 1996). Generally, but not uniformly, accepted is the positive relationship between goal importance and organizational performance (Bourgeois & Singh, 1983; Kellermanns, Walter, Lechner, & Floyd, 2005). Goal importance, or priority, has been viewed by scholars as an indicator of organizational commitment toward the goal (Shinkle, 2012) and has also been studied as strength of aspirations (Cavusgil & Nevin, 1981; Shinkle & Kriauciunas, 2012). However, through the decades of research on organizational goals, the role of operational-level governance has been conspicuously absent. Operational-level governance is the set of processes and procedures that guide an organization's activity (Schnatterly & Maritan, 2003; Smart, Maddern, & Maull, 2009). Operational-level governance generally considers defining, measuring, monitoring, and managing (assuring adherence) of governance processes toward goal accomplishment (Hall, 1982 ; Roth, Schweiger, & Morrison, 1991). Thus, operational-level governance plays an important role in organizational performance from the goal implementation perspective (Keizer, Lindenberg, & Steg, 2008; Lindenberg & Foss, 2011). However, the goal literature takes for granted that goals are properly implemented and will deliver the desired performance, even though it is generally accepted that operational-level governance is heterogeneous across firms (cf. Noble, 1999). Since both goals and governance influence organizational performance, the limited attention to the joint effects of operational-level governance and goal importance on performance is troubling. While there are beginning signs of change from scholars interested in the micro-foundations of organizational performance (Eisenhardt, Furr, & Bingham,

2010; Felin, Foss, Heimeriks, & Madsen, 2012), we are currently left with an incomplete understanding. Taking a next step in this area, we ask: are goals and governance substitutes or complements?

To address this question, we investigate organizational goal importance and operational-level governance and their relationship with organizational performance, both directly and jointly. We build our arguments generally following a behavioral perspective by considering a core mechanism of attention-motivation-search for both goals and governance. We extend the governance arguments by examining a curvilinear relationship due to the managerial and organizational costs of governance. We build our causal arguments by drawing from multiple theoretical views in the strategic management field. In the area of goal importance, we draw arguments from the attention theory (Ocasio, 1997; Simon, 1947) and "problemistic search" (Cyert & March, 1963; Greve, 1996). In the area of operational-level governance, we draw arguments from control theory (e.g. Campion & Lord, 1982; Eisenhardt, 1985) and the literature on business process management (Hammer, 1990; Smart et al., 2009). These literatures also define a theory level construct for operational-level governance - the *degree of formalization*. The degree of formalization is the extent to which organizational rules and procedures are defined explicitly (Hall, 1982 ; Slater, Olson, & Hult, 2006), monitored, and managed to assure conformance (Eisenhardt, 1985; Lord & Hanges, 1987). In the remainder of the paper, we use the term governance formalization or operational-level governance formalization interchangeably.

We test our theoretical arguments using data collected through a survey of a large government organization during a transition to a new strategy and new set of goals in 2008 and 2009. The organization is the Information Technology branch of one of the states in the USA. This branch contained the information technology project managers and system developers for all agencies of the government of the state (i.e. Bureau of Motor Vehicles, Department of Revenue, etc.). The empirical analysis is based on 348 observations from such project managers (who are decision makers for their projects). We find support for a positive goal importance-performance relationship and an inverted u-shape relationship between operational-level governance formalization and performance. Importantly, we find strong interaction effects to indicate that the substitutes-complements relationship depends on the degree of governance formalization.

This work contributes to the literature by offering an integrated view of the connections between

organizational goals and operational-level governance. In particular, we are among the first to examine how organizational goals and operational-level governance simultaneously and interactively influence the performance of organizations. Our theoretical arguments and empirical results, that goals and governance are substitutes in the condition of low to moderate governance and goals and governance are complements in the condition of moderate to high governance, is both novel and provocative. Our findings suggest that benefits may accrue to organizations that manage goals and governance in an integrated manner. Further, our investigation may help explain the mixed results that studies of goal-performance relationships observe. We contend that operational-level governance is a critical, and largely overlooked, contingency variable in such studies. In sum, we believe this research addresses a fundamental void in the literature that has both scholarly and practical implications.

THEORETICAL BACKGROUND

Organizational Goal Importance

Goal priority or importance (used interchangeably) has a long history (Bourgeois & Singh, 1983; Kellermanns et al., 2005; Taylor, 1911). Several literature streams address goal priority and importance. Ansoff (1979) considers both the aggressiveness of aspirations and the vigour (commitment) with which they are pursued (for an elaboration on goal priority, see (Ansoff, 1984). The literature acknowledging the importance of mid-level managers in business strategy highlights the relevance of goal priorities (Kellermanns et al., 2005; Smith, Mitchell, & Summer, 1985). Importantly, the most prevalent literature on goals, behavioral theory of the firm (Cyert & March, 1963), is silent regarding goal importance. This literature makes the assumption that organizational "… participants perceive the specific aspirations (goals) as important, and are motivated to achieve them."(Mezias, Chen, & Murphy, 2002:1289). However; behavioral theory argues that organizations allocate attention sequentially among multiple goals, assuming implicitly that a priority may exist. It follows that goal priority is particularly important in the case of multiple goals, although this subject has received limited attention (Shinkle, 2012).

Operational-level Governance

There is a paucity of research in the strategic management literature regarding operational processes and procedures (Noble, 1999; Schnatterly & Maritan, 2003; Smart et al., 2009), even though management control

systems (Marginson, 2002; Simons, 1994) and business process management have high exposure in the practitioner literature (Hammer, 1990; Smart et al., 2009). Research has largely addressed macro-governance issues such as leadership structures, boards of directors, and stock ownership (Coles, McWilliams, & Sen, 2001; Schnatterly & Maritan, 2003). Refreshingly, scholars have recently begun investigating the micro-foundations of organizational performance (Eisenhardt et al., 2010; Lindenberg & Foss, 2011). In this literature, scholars examine the individual-level and group-level actions that lead to superior performance (Eisenhardt et al., 2010).

Operational-level governance is most studied from the perspective of control theory (Campion & Lord, 1982; Eisenhardt, 1985). Management control theory anticipates that managers influence worker motivation by using organizational goals as performance reference points (Campion & Lord, 1982; Carver & Scheier, 1981; Eisenhardt, 1985; Klein, 1989). Mechanisms of control theory generally direct organizational attention toward strategic objectives and motivate employees. Barney, Wright, and Ketchen Jr (2001) suggest that implementation of such operational-level governance systems enables firms to gain competitive advantage by better utilizing the resources they control. Such a competitive advantage leads to higher organiztional performance.

The most prominent construct for operational-level governance is the *degree of formalization* (Roth et al., 1991; Slater et al., 2006). We take an aggregate view, and define the degree of governance formalization as the extent to which organizational rules and procedures are defined explicitly (Hall, 1982 ; Kerr & Jermier, 1978; Olson, Slater, & Hult, 2005), monitored, and managed to assure conformance (Lord & Hanges, 1987). Formalized operational-level governance prescribes appropriate behaviors with rules and procedures. The formalization of operational-level governance has traditionally been associated with rationality of decision-making (Miller, 1987) and organizational efficiency. In contrast to this view, formalized processes can also allow for flexibility to uncertainties (Ocasio, 2011; Salvato, 2009). This flexibility is accomplished by formalized processes requiring less managerial attention, so that such managerial attention can be given to issues created by unpredictable events. In this way, formalized processes aid efficiency and flexibility simultaneously.

HYPOTHESES DEVELOPMENT

Goal Importance and Performance

The causal mechanism between goal importance and organizational performance is attention, motivation, and search. In general, goal importance defines desired organizational outcomes and directs attention toward the specific performance dimension identified (Fiegenbaum et al., 1996; Kellermanns et al., 2005; Ocasio, 1997). Organizational attention increases the motivation, or at least motivates behavior, toward that performance area (Ocasio & Joseph, 2005). This motivated behavior results in search and "search ordinarily results in solutions" – enhancing performance (Cyert & March, 1963:278). More specifically, this mechanism follows logically from the attention based view (Ocasio, 1997) and studies on goal commitment. Goal commitment is recognized to enhance search behaviors which results in performance improvement (Klein, Wesson, Hollenbeck, Wright, & DeShon, 2001).

With low goal importance, decision makers limit their attention on this area of performance. Thus, motivation is low and search efforts will be constrained. Organizational efforts to improve performance toward the goal by searching for new solutions, business practices, or revising operational routines will be limited or non-existent. This results in low performance. In contrast, with high goal importance, the attention of decision makers and the organization is directed toward this area of performance. In this case, performance motivation is high and high levels of effort on problemistic search will ensue. This results in high performance. Hence, we hypothesize:

> ***Hypothesis 1****: Higher goal importance on a specific goal leads to higher organizational performance on that goal.*

Operational-level Governance Formalization and Performance

Operational-level governance systems direct organizational attention and thus influence the attention-motivation-search mechanism. However, unlike goal importance, governance formalization directs attention toward the process to achieve the outcome rather than toward the outcome itself. Generally, formalized operational-level governance systems, in a manner analogous to goals, direct attention toward performance, motivate behavior by defining boundaries for acceptable behavior, and direct search by defining boundaries for search activity. However, unlike goal importance, governance has an increasing cost with formalization.

We build our argument for a curvilinear relationship based on a consideration of these costs.

Prior studies, while limited, have shown that higher level of operational-level governance leads to higher performance (Ecker, Triest, & Williams, 2011). This is because each rule set by a firm directs attention and thus may contribute to operational efficiency. This improved efficiency is generally associated with competitive advantage and higher performance. Efficiency-based rationales suggest a positive relationship between operational-level governance and firm performance (Adler, Goldoftas, & Levine, 1999; Eisenhardt et al., 2010). With low formalization in the governance system, performance is low. This is because the organization lacks specific rules and procedures to follow and organizational procedures lack explicit definition, monitoring, and management. As the formalization of the governance system increases the organization will increasingly have explicit rules and management to oversight to direct attention and assure adherence to the process. Hence, performance improves. However, a linear relationship based on efficiency ignores the possibility of costs associated with maintaining a high degree of governance formalization.

While increasing governance formalization directs attention to the governance process it also requires the allocation of additional resources by the manager and the organization to understand, monitor, and follow the governance rules. This additional resource requirement will have both a benefit and a cost. This rationale of increasing costs at higher levels of governance formalization supports the notion of a curvilinear relationship. We contend that after a certain critical point the performance benefits of increasing governance formalization will be offset by the escalating costs. At a fundamental level, operational-level rules provide the manager and organizational members specific guidance of how to complete their tasks. However, as operational-level rules increase in formalization, managers and organizational members must make sure all tasks conform to the rules. This adherence to formalized rules increases costs (Olson et al., 2005; Porter, 1985), increases resource requirements, limits autonomy, and thus decreases motivation (Ocasio & Joseph, 2005).

In sum, we theorize that after a point, the costs of increases in operational-level governance formalization will be counterproductive to the gains in performance outcomes. This results in a curvilinear relationship. Hence, we propose:

Hypothesis 2*: The relationship between the degree of formalization of the operational-level*

governance system and performance will increase at first, whilst the effect will turn negative after a peak, resulting in an inverted U-shape relationship.

Joint Effects of Goal Importance and Operational-level Governance

Hypothesis 1 argues that goal importance has a positive direct effect on performance. Hypothesis 2 argues for an inverted U-shaped relationship between operational-level governance and performance. Since goals define desired outcomes and operational-level governance systems are designed to provide a means to achieve desired outcomes, we contend goals and governance will have joint effects.

We begin by considering the situation when goal importance is low and examine governance system formalization from low to high. With low goal importance and low governance formalization, search toward goal accomplishment is low and governance system rules lack explicit definition and management. This results in low performance because attention and motivation toward performance is lacking. As the formalization of the governance system increases the organization will increasingly have explicit rules and management oversight to assure adherence to the process. Hence, performance improves and there is a positive relationship between governance and performance. This is because the governance system directs attention and motivates behavior toward performance even with a low level of goal importance. But this positive relationship will reach a point of diminishing returns. As the governance formalization continues to increase, the organization has to allocate additional resources (time and effort) to understand, monitor, and follow the governance rules. Thus, costs grow as governance formalization increases, reaching a point where maintenance of the rules costs more than the benefits (Foss & Lindenberg, 2013; Jason & Herman, 2013; Wales, Patel, Parida, & Kreiser, 2013). This cost-benefit ratio is aggravated (high cost with low benefit) due to the lack of motivation on the particular dimension of performance. As a result, in the low goal importance situation, the relationship between the operational-level governance and performance is analogous to Hypothesis 2 (inverted U).

Next, we consider the situation when goal importance is high and examine governance system formalization from low to high. With high goal importance and low governance formalization, search toward goal accomplishment is high and governance system rules lack explicit definition and management. This results in high performance, because there is high attention to the important goal and thus high motivation to

search (Cyert & March, 1963) with commensurate lack of limits on the search because rule formalization is low. As the formalization of the governance system increases the organization will increasingly have explicit rules and management oversight to assure adherence to the process. In addition to constraining search, such rules add cost (time and effort) thus performance will decrease. However, we contend this negative relationship has limits. Governance systems are generally designed to aid organizational processes of goal attainment (Hage & Aiken, 1969; McGrath, Ferrier, & Mendelow, 2004) and they are made more formal as successful experiences accrue to these processes (Cohen & Levinthal, 1990; Helfat, 1994; Zahra & George, 2002).[1] The high organizational attention and motivation on important goals supports the organization to adhere to the formalized process. Because the benefit of achieving the desired outcome is higher, the point at which costs exceeds benefits is at a higher degree of governance formalization. In comparison to the low goal importance situation, higher performance will be observed when both goal importance and governance formalization are high.

In sum, our arguments propose that goal importance and governance formalization interact regarding performance. Hence, we propose:

> ***Hypothesis 3****: Higher goal importance enhances performance when the level of formalization of the operational-level governance system is low and mitigates the decline of performance when the level of formalization of the operational-level governance system is high.*

DATA AND METHODS

To test our theory we require empirical data with variance in organizational goals, governance, and performance. Fortunately, we have access to a proprietary dataset collected through a detailed survey of a large government organization during a transition to a new strategy and new set of goals in 2008 and 2009. The organization was the Information Technology branch of one of the states in the USA. This organization contained the information technology project managers and system developers for all agencies of the government of the state (i.e. Bureau of Motor Vehicles, Department of Revenue, etc.). The questionnaires were delivered by e-mail to 770 participants and 447 were returned, creating a respond rate of 58.1%. These 447 individuals were nested within126 workgroups in ten departments each department serving an agency. Not

[1] While there may be exceptions to this general expectation, exceptions do not invalidate a theory.

all respondents provided full data, so our model is based on 348 observations. In this particular situation, each department, and to some extent each workgroup, implemented their strategies and programs in different ways providing variance for this study. The use of a governmental organization to test our model is ideal because the nature of government information technology work tends to result in a high level of commonality among other environmental attributes. Thus, differences between the variables of interest are more likely caused by internal phenomena rather than external causes. Since the information technology respondents in our observations are project managers and system developers they represent small independent teams of activity.

Dependent variable

We measure performance on "*Meet Customer Requirement*" through a survey response on a five-point Likert scale. Respondents were asked to rate their department performance over the past year from strongly disagree to strongly agree to "My department currently meets our customer requirements." In our investigated organizational setting, each individual served as a project manager or system developer (software). Their responsibility was to determine and implement the exact needs of their customers. Therefore, we contend that measuring the perceived level of customer requirement that a project manager was meeting is a context relevant indicator of performance.

Independent variables

Goal importance. We measure the importance of internal customer satisfaction goal through a survey response. Our resulting measure for goal importance is the percentage of the 20 points allocated to internal customer satisfaction (i.e., more points = more important). Ranking of choices has been shown to be a more robust approach than absolute importance ratings (Krosnick, 1999).

Degree of governance formalization. We developed a six-item measure of the degree of formalization of operational-level governance (shown in Appendix A). The items in this approach were based on first-hand observations in the organization, discussions with numerous IT workgroup and department managers (Eisenhardt, 1989) and general business practices in change management (Kettinger, Teng, & Guha, 1997; Smart et al., 2009). The items are broad in scope because the organization did not have a defined standardized process. Workgroup and Department managers had total discretion to choose their approach; thus, approaches included no process, action item tracking, six-sigma, lean, and lean six-sigma methodologies. The items were

measured on a 5-point Likert-scale anchored by 1 = "strongly disagree" and 5= "strongly agree".

Control variables

We controlled *employment duration*, *education*, *goal difficulty*, and *leadership management*. Employment duration (i.e., tenure at the State in current position) was measured in years. Education was indicated on a 5-point scale anchored by 1 = "high school", 2 = "some college", 3 = "associate degree", 4 = "bachelor degree", and 5 = "graduate degree." Goal difficulty was measured by one-item measure. The item was: "Rate the recent improvement activity of your department on the difficulty of improvement activity". The item was measured on a 5-point scale anchored by 1 = "extremely easy" and 5 = "extremely difficult". For leadership, we used a three-item measure (shown in Appendix A) of change leadership effectiveness (Wanberg, Kanfer, & Banas, 2000). The items were measured on a 5-point Likert-scale anchored by 1 = "strongly disagree" and 5= "strongly agree".

Analysis

Importantly, as previously described, the organization consists of information technology project managers and system developers. In this way, they are quasi-independent agents since they manage separate projects. So, for this study we model each observation as an independent sample.[2] Our analysis requires a regression model with an interaction term. Before running our statistical models, independent variables in the interaction were mean-centered to reduce multicollinearity concerns (Aiken, West, & Reno, 1991). Collinearity tests indicate that all variable inflation factors were less than 2.27, indicating that multicollinearity is not a problem (Cohen, Cohen, West, & Aiken, 2003). Table 1shows the Pearson correlations and descriptive statistics of the study. Table 2 shows the regression. To assess model significance, we tested differences in the F-stat and adjusted-R^2 values. As shown in Table 2, each model significantly added to the explanatory power (reliability and validity results not shown due to space constraints).

Insert Table 1 & Table 2 about here

Results

Hypothesis 1 is supported. This support is indicated by the significant coefficient 1.05 ($p < 0.05$) in

[2] Our dataset includes only 10 departments, leaving inadequate power to appropriately test a curvilinear relationship. We perform robustness tests on this assumption and on the potential of common method bias.

Model 2. Hypothesis 2 is supported. Support for Hypothesis 2 is evidenced by a positive coefficient on governance 0.20 ($p<0.01$) and a negative coefficient on governance squared 0.14 ($p<0.01$) in Model 4. Hypothesis 3 is supported. We observe support for Hypothesis 3 in Model 6. The coefficient of the interaction term between goal and governance-squared is 1.29 ($p < 0.05$). In order to better see the curvilinear nature of this effect, Figure 1 shows a moderation graph for the level of formalization of the operational-level governance system and goal importance.

Insert Figure 1 & Table 3 about here

To evaluate the robustness of our analysis, we conducted numerous sensitivity checks. For example, we used dummy variables to represent a grouping variable (i.e., departments) to partial out the variance in department level, and then tested the same regression model. Table 3 shows the statistical result of the sensitivity check. We considered department level performance as the dependent variable with aggregated (averaged) the independent variables. The results of this analysis were consistent with our reported findings; however, the results are less significant due to the limited (10) departmental observations. We also considered common method bias (see note 2 in Table 2).

DISCUSSION

The intent of this study is to examine the joint influence of goals and governance and to investigate if they are substitutes or complements. Our arguments are based on a mechanism of attention-motivation-search and consider a management control theory perspective. The supporting results for Hypothesis 1 and 2 follow our theoretical arguments. The findings for Hypothesis 1 are consistent with prior research on organizational goals. The findings for Hypothesis 2 are consistent with the prior research on strategy implementation (e.g. Olson, Slater, & Hult, 2005) and operational –level governance (e.g. Roth, Schweiger, & Morrison, 1991). To be more specific, our findings confirm and extend our understanding of the effect of operational-level governance formalization on performance. In this way, we also support prior research on "too much of a good thing" (Pierce & Aguinis, 2013).

Most importantly, our results for Hypothesis 3, exemplified in Figure 1, provide novel insights. First, higher goal importance enhances performance when the level of formalization of the operational-level

governance system is low to moderate. Thus, in the condition of low to moderate governance, goals and governance are substitutes. Second, higher goal importance not only mitigates the decline of performance when the level of formalization of the operational-level governance system is high, it promotes higher performance. Thus, in the condition of moderate to high governance, goals and governance are complements. So, the substitutes-complements relationship depends on the degree of governance formalization. This finding is provocative so we investigated further. We tested other goals (cost and quality) and did not find this relationship to be significant. We believe our arguments have a boundary condition of high group efficacy. That is, the arguments apply when the actors believe they have a strong ability to influence the outcome. Cost and quality are distant performance goals in that they have multiple confounding influences and may not be achievable in the short term.

Our study provides theoretical and empirical support for the phenomena that superior organizational performance can be achieved through allocating priority to the specific goal and specifying a high degree of governance formalization. While counter to much management theory where goal priority is neglected (Cyert & March, 1963), this is consistent with the view of formalized governance processes allowing the organization to direct attention to more novel search activity by reducing the required attention on routinized activity (Ocasio, 2011; Salvato, 2009).

Overall, our implications for managers stand in stark contrast to prior work. For goals that have high group efficacy, goals of high importance should be managed using governance systems that are either highly formalized or of very low formalization. For such goals, governance systems of moderate formalization result in lower performance outcomes. We acknowledge that this is a preliminary finding and deserves more empirical scrutiny (currently underway). However, we have a strong indication that goals and governance should be considered in an integrated manner – theoretically, empirically, and practically.

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Table 1: Pearson correlations and descriptive statistics

	1	2	3	4	5	6	7
1. Performance (Meet Customer Requirement)							
2. Goal importance	-0.02						
3. Degree of governance formalization	0.35***	-0.03					
4. Leadership	0.44***	-0.03	0.52***				
5. Goal difficulty	-0.19***	0.02	-0.10*	-0.06			
6. Employment duration	-0.07	-0.08	-0.01	-0.17***	0.03		
7. Education	0.02	-0.02	-0.08	-0.01	0.17***	-0.17***	
Descriptive							
N	438	446	438	439	440	350	368
Mean	3.77	0	0	3.68	3.48	12.33	3.42
Std Dev	0.88	0.11	0.73	1.01	0.81	10.49	1.15
Min	1	-0.24	-2.22	1	1	0	1
Max	5	0.76	1.77	5	5	45	5

Table 2: Regression results for performance

	Model 1: Control variables only	Model 2: Direct effect 1	Model 3: Direct effect 2	Model 4: Nonlinear effects – GF^2	Model 5: Moderation effect – GI*GF	Model 6: Full model
Intercepts	3.03***	3.02***	3.20***	3.14***	3.15***	3.09***
Controls						
Employment duration	0.00	0.00	0.00	0.00	0.00	0.00
Education	0.05	0.05	0.05	0.06	0.05	0.05
Goal difficulty	-0.22***	-0.22***	-0.21***	-0.23***	-0.24***	-0.22***
Leadership	0.37***	0.37***	0.31***	0.31***	0.32***	0.32***
Direct effects						
Goal importance (GI)		1.10*	1.05*	1.12**	0.79	0.14
Governance formalization (GF)			0.15*	0.20**	0.19**	0.18**
Nonlinear effects						
Governance formalization – squared (GF^2)				0.14**	0.16**	0.18***
Moderation effects						
GI x GF					-1.60**	-0.92
GI x GF^2						1.29*
F-stat	24.81 (4)	21.46 (5)	19.06 (6)	17.55 (7)	16.66 (8)	15.46 (9)
ΔF		3.21	2.4	1.51	0.89	1.2
Adjusted-R2	0.215	0.227	0.238	0.250	0.265	0.273
ΔAdjusted-R2		0.012	0.011	0.012	0.015	0.008

*Note 1: N = 348 * p<0.05 ** p < 0.01 *** p < 0.001; standardized regression coefficients (two-tailed tests)*

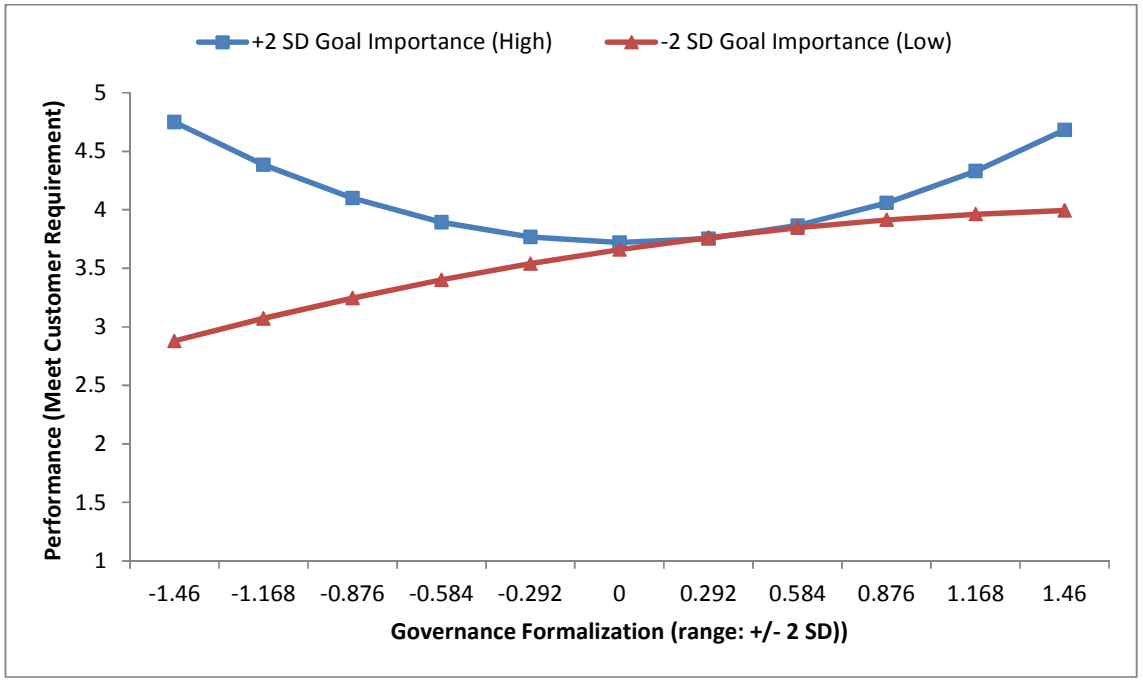
Note 2: In addition, we collected data using single source, self-report methodology; therefore, common method variance may be a concern (Podsakoff, MacKenzie, Jeong-Yeon, & Podsakoff, 2003). However, Siemsen, Roth, and Oliveira (2010) argued that the presence of common method variance did not significantly influence analysis results if there are quadratic terms in the regression model. In our model, we have a quadratic term and an interaction with a quadratic term; hence the quadratic effects in the regression equation cannot be artefacts of method variance. We acknowledge the potential of common method variance as a potential limitation in the study, but statistically significant quadratic effects in our OLS regression can be appropriately interpreted as meaningful.

Table 3: Robust Test – Added dummy variables for grouping variable

	Model 1: Control variables only	Model 2: Direct effect 1	Model 3: Direct effect 2	Model 4: Nonlinear effects - GF^2	Model 5: Joint effect - GI*GF	Model 6: Full model
Intercepts	2.53***	2.58***	2.76***	2.65***	2.74***	2.74***
Group 1	0.46	0.37	0.33	0.43	0.31	0.27
Group 2	0.02	-0.07	-0.12	0.03	-0.07	-0.12
Group 3	0.47	0.42	0.34	0.47	0.32	0.27
Group 4	0.27	0.19	0.12	0.23	0.15	0.11
Group 5	0.45	0.37	0.31	0.44	0.32	0.28
Group 6	0.84**	0.77*	0.71*	0.78**	0.70*	0.61
Group 7	0.63*	0.58	0.51	0.61*	0.46	0.43
Group 8	0.38	0.30	0.32	0.28	0.26	0.28
Group 9	0.37	0.33	0.29	0.39	0.29	0.24
Group 10						
Controls						
Employment duration	0.00	0.00	0.00	0.00	0.00	0.00
Education	0.06	0.07	0.07	0.07	0.06	0.07
Goal difficulty	-0.19***	-0.20***	-0.19***	-0.21***	-0.22***	-0.20***
Leadership	0.34***	0.34***	0.29***	0.29***	0.31***	0.31***
Direct effects						
Goal importance (GI)		1.10*	1.05*	1.11*	0.82	0.29
Governance Formalization (GF)			0.14*	0.18**	0.16*	0.16*
Nonlinear effects						
Governance Formalization – squared (GF^2)				0.14*	0.15**	0.17**
Moderation effects						
GI x GF					-1.46*	-0.93
GI x GF^2						1.04^{+}
F-stat	8.84	8.79	8.56	8.55	8.53	8.26
ΔF		0.05	0.23	0.01	0.02	0.27
Adjusted-R2	0.229	0.241	0.248	0.260	0.271	0.276
ΔAdjusted-R2		0.012	0.007	0.012	0.011	0.005

Note: N = 344 $^{+}$ p < 0.1 p<0.05 ** p < 0.01 *** p < 0.001; standardized regression coefficients (two-tailed tests)*

Figure 1: Joint effect of governance formalization and goal importance on performance



Note: We choose ±2SD to better show the range of data in our dataset and to visualize the relationship.

APPENDIX: Survey Item Questions

Goal importance:
Rate the importance of the following goals to your IT Department by distributing 20 points among the four choices (more points = more important). The total points distributed among all four choices must sum to 20.

1. Cost (e.g. reducing costs or more efficient use of resources).
2. Quality (e.g. reducing errors, increasing reliability, increasing security).
3. Internal customer satisfaction (e.g. other departments or agencies).
4. End-user customer satisfaction (e.g. taxpayer or service recipient).

Governance formalization:
Think about the improvement activity in your IT department recently and rate the level of agreement with the following statements (0 = "strongly disagree" and 5 = "strongly agree").

1. These activities use a structured (defined) process.
2. These activities use program management approaches (project charters, time plans, etc).
3. These activities use objectives and performance metrics to promote improvement progress.
4. These activities use detailed action item follow-up approaches.
5. The employees adhere to the defined procedures for improvement or change.
6. These activities were not implemented using any defined procedure for change.

Leadership:
Evaluate the effectiveness of your supervisor in leading change over the last three years on each item below (0 = "strongly disagree" and 5 = "strongly agree").

1. Overall, my supervisor led the implementation of change effectively.
2. Generally, my supervisor was able to unite the employees to make these changes a success.
3. My supervisor took steps to provide the resources needed for the changes.