

# Innovation by Design: The Hybrid Organization

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## **Abstract**

The past 20 years has seen the rapid rise of hybrid organizations that blend traditional organizational elements with market-like elements. Over the same time period, there has also been a global explosion in innovation. In this paper we examine the relationship between elements of hybrid organization forms and innovation outcomes. We use meta-analysis to summarize data on 16,605 firms across industries and geographies. Our results show that robust relationships exist between innovation and three key elements of hybrid organizations – autonomy, rewards and ownership. Further analyses reveal that organizational support provides a critical link between innovation and the hybrid organizational levers.

**Keywords:** *innovation, governance, hybrid, support, autonomy*

## ***The Hybrid Phenomenon***

Over the past 20 years innovation has become the “Holy Grail in management – an elusive goal to be pursued continuously” (Lee, Edmonson, Thomke & Worline, 2004: 310). Over the same time period, hybrid organizational forms have increasingly become the norm in large parts of the business landscape, and have been the topic of recent significant theoretical development (Makadok & Coff, 2009). Hybrids blend traditional organizational elements with market-like elements. They vary greatly, from traditional-looking organizations that selectively implement market-based pay mechanisms inside the firm to more radical hybrids such as Google and W. L. Gore (owners of the Gore-Tex brand, among other businesses), which are highly decen-

tralized and networked. Much hybridization has involved corporations significantly reorganizing activities around smaller organizational building blocks, teams, decentralized decision making and empowered work practices. Such changes suggest that classical hierarchical forms of organizing have evolved by being steadily infused with elements of market-like behaviors. These changes may reflect the efficient adaptation of organizational forms to contemporary competitive demands, which includes the rapid adoption and production of innovations.

## ***Our Approach***

In this paper we operationalize contemporary theoretical development relating to hybrid organizations (Makadok & Coff, 2009) in order to explore the

possibility that the hybridization of organizations is associated with increases in the innovativeness of those organizations. Our goal is to use readily available empirical data to analyze this connection between hybrid organizations and innovation. To do this we use a meta-analytic approach, which enables us to statistically aggregate data from a wide range of prior studies in order to ascertain whether the key features of hybrid organizations are systematically related to differences in innovation among organizations. While other fields of science, such as psychology and medicine, pioneered the use of meta-analysis, this approach has recently been strongly advocated in management research under the title of “evidence-based management” and has begun to see widespread use in a number of top journals. However, no study has yet examined the relationship between hybrids and innovation, despite the obvious importance of both topics to managers working at the top of global corporations.

### *Takeaways*

This study extends current thinking on the relationship between organizational form and innovation in two ways. First, our results indicate that robust relationships exist between three key elements of hybrids and innovation. For the organizational design elements of autonomy and rewards, a move in a more market-like direction is associated with a statistically significant increase in innovative output. Ownership displays a similar pro-market pattern, with external ownership being positively related to innovative output, while internal ownership is negatively related to innovative output. These findings are important because the mandate to innovate raises many questions about the best ways to organize for innovative tasks. In spite of – or because of – the considerable body of empirical studies that examine relationships between particular organizational factors and innovation, extant research often offers contradictory and confusing results, stemming from the use of different models and samples, and sometimes from the age of these studies (which may make them less relevant to contemporary decisions). Our meta-analytic methodology enabled us to simultaneously analyze the effects on innovation of all three elements of hy-

brids across a vast sample of organizations of all types, adjusting for factors such as the sample sizes in individual studies and presenting a coherent picture of the direction and relative strength of elements of hybrids on innovation outcomes.

Second, we identified the role of two moderators of the hybrids-innovation relationship: organization size and organizational support for innovation. This generates a more comprehensive framework for understanding the process by which hybrid elements enable innovation outcomes, by highlighting how the hybrid elements are sensitive to situational factors. Our statistical analysis suggests that support for innovation is highly significant as a moderator of both autonomy and rewards (the two variables for which we were able to collect data). Additionally, we found that autonomy and rewards more strongly connect with innovation in large firms than in small firms.

Together, these contributions bring an integrative perspective to the hybrids-innovation relationship and suggest useful alternatives to managers seeking to make their organizations more innovative in their products, services, processes and practices.

### *Organization*

In the next section of the paper, we identify the three key elements of hybrids from the academic literature, plus support for innovation, and our measures of innovativeness. The third section briefly describes the process we used to amass data from 20 years of academic research studies, and the methods we used to analyze it. The fourth section presents the results of the analysis. Finally, we close with a discussion of the implications of our findings for top managers, as well as for academics interested in research on hybrids and innovation.

### **SCOPE OF STUDY**

While a number of different trends have likely influenced the emergence of hybrids (e.g. information technology), the theoretical explanation for why these trends result in hybridization is focused on three organizational governance mechanisms: rewards, ownership and autonomy (Makadok & Coff, 2009). Each of these mechanisms changes the incentive structure for action in organizations by al-

locating three kinds of residual incomes:

- Autonomy involves residual rights of control over an agent's actions. Less autonomy means more bureaucratic control over the actions of organizational members and less individual empowerment.
- Rewards involve residual claims on the value of current outputs. When allocated to current members of an organization, they incentivize increases in production efforts.
- Ownership involves residual claims on the terminal value of the firm's assets, which encourages owners to maintain and increase the value of these assets.

These three basic variables represent three basic, independent levers for influencing the innovative potential of organizations, as follows.

### ***Autonomy***

The relationship between work autonomy and innovation has been recognized and variously described and measured in several different research literatures for half a century. For example, one original study (Burns & Stalker, 1961) described low centralization (hence high autonomy) as one of the characteristics of organic organizations, which are designed for creativity and innovation. In these organizations, decision-making authority is typically dispersed rather than being concentrated in the hands of a few managers. Studies typically measure "...the degree of... participation in decision making or... the degree of freedom organizational members have to make their own decisions." (Damanpour, 1991: 589). This definition highlights both a role for employees in determining how they do their job and the inclusion of their voice in decisions that affect them, themes that have been further developed in research on employee empowerment.

Two rationales are most commonly used to explain the impact of autonomy on innovation. First, perceived control is an important motivational variable in human behavior because self-determination increases employees' intrinsic motivation, which improves performance and creativity (Amabile, Conti, Coon, Lazenby, & Herron, 1996;

Deci, Koestner, & Ryan, 1999). Second, innovative activity depends on how well an organization leverages the stock of individual knowledge dispersed within it. Workplace autonomy influences employees' ability to self-organize and network with others in order to obtain and utilize the dispersed local, tacit, embedded and sticky information and knowledge they need to discover and solve problems, which also increases innovation.

In gathering data for our meta-analysis, we articulated autonomy as individual autonomy or workplace discretion within the organization. And though potential differences exist in the exact definition of the ideas of autonomy and workplace discretion (Patterson *et al.*, 2005; Shalley, Gilson, & Blum, 2000; Griffin, Patterson, & West, 2001; Holt, Rutherford, & Clohessy, 2007), we combine the two for the purposes of our investigation as both reflect the freedom of the individual to spend resources, engage in activities (DiLiello & Houghton, 2008) and determine work relationships (Vera & Crossan, 2005). We also include rational economic autonomous discretionary acts (Chandy & Tellis, 1998; Sadler-Smith, El-Kot, & Leat, 2003) as they reflect individual latitude. As appropriate, we reverse coded variables that seem opposed to autonomy such as power distance (Lam, Schaubroeck, & Aryee, 2002), centralization (Jansen, Van Den Bosch, & Volberda, 2006) and formalization (Nohria & Gulati, 1996).

### ***Rewards***

The creation of innovations requires tasks that are primarily cognitive and are thus difficult to directly observe and control. As a result, firms attempt to craft incentive mechanisms that indirectly control innovative effort by inducing employees to engage in innovative behaviors (Zenger & Lazzarini, 2004). These mechanisms can manifest in performance-contingent compensation delivered in several different forms, including one-off cash payments, year-end performance bonuses, favorable annual salary raises and promotion opportunities. These rewards may be tied to either innovation inputs (behaviors) or outputs (results).

Rewards are important inducements for innovation for two reasons. First, higher levels of rewards encourage higher levels of effort, since employees

stand to capture some portion of their increased performance through the incentive mechanism. Therefore it is likely that explicit rewards for innovation will increase innovative outputs. Second, more able employees will prefer to work at firms that offer more intense incentives because they will be better rewarded at such firms, compared with less talented employees who will prefer firms that offer less intense incentives, *ceteris paribus* (Zenger, 1992). As firms that use explicit rewards for innovation are likely to create a self-selection effect and encourage greater individual effort, this should be reflected in measures of the firm's innovative output. However, psychologists studying creativity in the workplace have at various times cautioned against the potentially negative effects of incentives for creative work (Amabile *et al.*, 1996; Deci *et al.*, 1999; Eisenberger, 1992), suggesting contingency in the connection between rewards and creativity and the need to build more sophisticated models that account for possible intervening variables.

Rewards come in many forms, and for the purposes of this investigation, we included strong incentives such as salary (Shaw, Gupta, & Delery, 2002), short-term pay and long-term pay (e.g., Yanadori & Marler, 2006) and contingent pay (Shipton, West, Dawson, Birdi, & Patterson, 2006), alongside weaker incentives such as recognition (DiLiello & Houghton, 2008), competitive rewards (Ferrin & Dirks, 2003) and a system to reward employees for progress on product or process innovations that take a long time to reach market (Barringer & Bluedorn, 1999). An additional attribute we applied to formal incentives was whether the evaluation criteria were quantitative or tangible.

### Ownership

Interest in the relationship between ownership and innovation can be traced at least to the 1980s (Hill & Snell, 1988), and it blossomed in the 1990s as one aspect of the broader research agenda of agency theory (Jensen & Meckling, 1976). Ownership provides a different incentive structure than rewards or autonomy. A key observation is that the interests of stockholders (principals) and managers (agents) diverge with regard to the management of firms. For external stockholders, innovation is a high

risk/high return strategy that can be managed by diversifying equity holdings across many firms. By contrast, owners managing one firm have less ability to diversify their risks. Therefore they bear the high risk of failing in the pursuit of innovation in their individual firm without the compensating benefit of upside returns via a portfolio of stockholdings in other innovative firms. Since managers are subject to this vulnerability, one might predict that they might avoid risk by reducing their commitments to, and emphasis on, innovation. Given the influence of a firm's leadership and top management team on the processes in organizations, it is reasonable to expect that these managerial factors will translate into significant differences in an organization's propensity to produce and adopt innovations. Thus, owners' ability to assert their goals depends on the extent to which they can effectively control a firm's management. Stock concentration (Demsetz & Lehn, 1985), managerial stock holdings (Demsetz, 1983) and the ratio of insiders to outsiders on firm boards (Fama & Jensen, 1983) are the primary factors influencing whose agenda is adopted – that of the owners or that of the managers. Stockholders who own even a relatively small block of stock have significant incentive to monitor and lobby senior management to prioritize innovation in the firm's strategy; block holdings should therefore be related to more innovative firms. Where management holds substantial stockholdings, it is expected that internal ownership will be related to lower innovation. With regard to board composition, it is expected that external board members are more likely than internal members to represent the interests and agenda of owners.

We identified work on the ownership of firm stock or equity and divided our findings into two groups: external and internal ownership. We operationalized external ownership as outside directors (Deutsch, 2007), institutional ownership (Baysinger, Kosnik, & Turk 1991; Zahra, 1996), major corporate stockholders (Makri, Lane, & Gomez-Mejia, 2006) and blockholders (Sanders & Carpenter, 1998), and pressure-resistant ownership (Kochhar & David, 1996). With internal ownership, we included the value and percentage of equity owned by insiders and directors (Hoskisson, Hitt, Johnson, & Grossman, 2002), individual ownership concentra-

tion (Baysinger et al., 1991), CEO and executive ownership (Zahra, 1996; Hansen & Hill, 1991), as well as individual owner control (Balkin, Markman, & Gomez-Mejia, 2000).

### ***Support for Innovation***

In addition to the three hybrid elements described above, we identified a fourth variable – support for innovation – as an important factor we hypothesized to influence how the hybrid elements impact innovativeness. Support for innovation is “the expectation, approval and practical support of attempts to introduce new and improved ways of doing things in the work environment” (West, 1990). Jung, Chow, and Wu (2003) measured support for innovation using a scale originally developed by Siegel and Kaemmerer (1978) and later modified by Scott and Bruce (1994). Support for innovation is beneficial because innovative work is often demanding and stressful, thus individuals selectively engage in innovative efforts depending on how much social support and encouragement is available for them. Organizational support operates as encouragement for efforts related to engaging in innovation such as “support for innovation” (Bain, Mann, & Pirola-Merlo, 2001; Clegg, Unsworth, Epitropaki, & Parker, 2002; Jung et al., 2003; Krause, 2004; Scott & Bruce, 1994; West & Anderson, 1996), as well as related constructs – always within the organization and in the context of innovation – of organizational and management support (Hurley & Hult, 1998; Lee & Peccei, 2007; Patterson et al., 2005; Shalley, Gilson & Blum, 2009; West & Anderson, 1996; Zhou & George, 2001), collaboration (Hurley & Hult, 1998) and product champions (Chandy & Tellis, 1998; Day, 1994). But organizational support can also offer a safety net. Innovation is an uncertain activity, subject to unpredictable results as well as outright failure. And the willingness of the organization to provide psychological safety (Baer & Frese, 2003; Edmondson, 1999; Nilniyom, 2007) in those situations, or to work to reframe failure as learning (Edmondson, 1999; Shipton, Fay, West, Patterson, & Birdi, 2005; Shipton et al., 2006) also constitute support for innovation in our operationalization of the concept.

### ***Innovation***

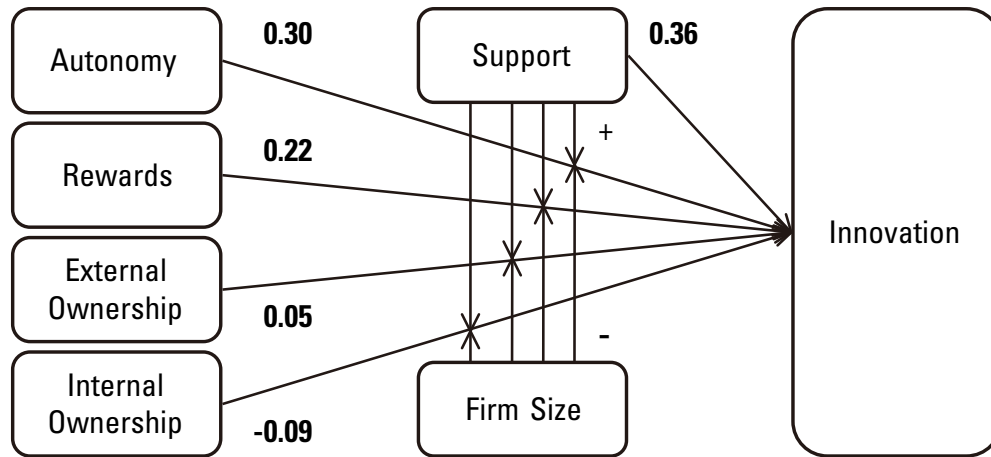
Innovation was assessed using measures that range from personal behaviors, such as innovative work behavior (Van der Vegt & Janssen, 2003) and creativity (Nilniyom, 2007), to some of the observable outcomes of that behavior. Outcomes include innovative products (Kochhar & David, 1996) and services (Goes & Park, 1997), as well as related inputs, such as patent activity (Oldham & Cummings, 1996), R&D intensity (Deutsch, 2007) and R&D outputs (David, Hitt, & Gimeno, 2001). Furthermore, qualitative (Shaw et al., 2002) and financial performance attributable to innovation (Jansen et al., 2006) were also included.

### **DATA COLLECTION**

We searched the academic literature in leading outlets at the intersection of innovation and organizations. We began by consulting the *Financial Times*'s (FT) list of top academic publications, selecting all the outlets the FT highlights in the areas of economics, general management, human resources management and organizational behavior. We also included *Administrative Science Quarterly* from the FT's list of “other” publications due to its coverage of management and organization. In addition to the 17 journals identified from the FT's list, we sought to ensure inclusion of outlets specializing in innovation. So we searched the Ebsco, ScienceDirect, Emerald and Ingenta databases looking for any peer-reviewed journal that returned at least 30 articles with the keyword “innovation.” That search yielded an additional 17 outlets. In those journals we searched every article from 1990 to 2009 with a minimum of eight keywords for each of our constructs of interest: a) autonomy, b) rewards, c) ownership, d) support, and e) innovation. We then filtered each article to determine whether it measures some aspect of innovation, and at least one independent variable in our model.

We then used the studies identified from this initial search to initiate a snowball search process. We searched the reference list in each study we selected with the purpose of adding studies from journals not included in our initial search, and of potentially adding whole journals to our search set. Our process for this aspect of the data collection





**FIGURE 1: Model of Hybrid Organization Elements and Relationship with Innovation**

involved reading the abstracts of each of the items in the reference list of a previously selected study. Articles with relevant abstracts were subject to the same initial criteria we used to select studies from our initial 34 journals. If the study met the filter criteria, it was included in the potential data set. Our final sample frame extended to 49 academic journals. From those journals, we extracted a data set that included 423 observations from within 75 unique studies, representing a total of 16,605 firms.

## ANALYSES

After correcting the raw data for measurement error, we proceeded to analyze it, using meta-analysis (Hunter & Schmidt, 1990) to compute a mean correlation for each relationship between an element of a hybrid organization, and innovation, weighting each study according to sample size and employing a fixed effects model (Stahl & Voigt, 2008). The results indicated that Support has the strongest mean correlation (0.36) with Innovation, followed by Autonomy (0.30) and Rewards (0.22). As we had expected from our review of the literature, Ownership demonstrated a split result, whereby External Ownership demonstrated a positive correlation (0.05) with Innovation, whereas Internal Ownership demonstrated a negative correlation (-0.09) with Innovation. The relationships are depicted in Figure 1, with the mean correlations indicated on the paths between model variables.

In order to examine contingency relationships

in our model, we used linear regression to test for moderating effects of both firm size and the hybrid organizational design element of Support. In order to examine the impact of firm size in our analyses, we coded the sample within each study as either representing large firms (500 or more employees) or small firms (fewer than 500 employees) (SBA, 2010; Beck et al., 2005; Rosenbusch et al., 2011), using a binary variable. If the study did not adequately describe the sample, or if the sample included firms of mixed size, that study was excluded from the analysis of firm size moderation. As a result, 16 of the 75 studies in our data set were excluded from this particular analysis.

We began our regression analyses with a baseline model composed of only the main effect elements of hybrid organizations. Because performing regression with meta-analytic data requires that independent variables be coded as binaries and regressed against the effect size, the coefficients reported represent differences compared with the excluded baseline variable of Internal Ownership. This, and the fact that regression distributes variance across many variables instead of analyzing only pairwise correlations, accounts for the difference in the coefficients between Figure 1 and those presented in Table 1. And while most of the main effect relationships remain relatively stable in regression, compared with main effect correlations calculated using the meta-analysis process and presented in Figure 1, we highlight one difference of interest. The coefficient for Rewards is proportion-

**TABLE 1: Regression Model of Hybrid Organization Elements and Moderators on Innovation**

	Model 1 Baseline		Model 2 Firm Size Moderation		Model 3 Firm Size Moderation and Support Moderation	
	Unstandardized coefficient	Standard error	Unstandardized coefficient	Standard error	Unstandardized coefficient	Standard error
(Constant)	-0.089 **	0.034	0.113 *	0.055	0.134 **	0.051
Autonomy binary <sup>a</sup>	0.303 ***	0.050	0.200 ***	0.051	0.189 ***	0.047
Support binary <sup>a</sup>	0.447 ***	0.048	0.397 ***	0.045	0.210 **	0.062
Rewards binary <sup>a</sup>	0.469 ***	0.048	0.418 ***	0.046	0.413 ***	0.042
External Ownership binary <sup>a</sup>	0.141 **	0.047	0.135 **	0.043	0.135 **	0.039
Firm Size			-0.208 ***	0.047	-0.230 ***	0.044
Support Interaction Term					1.315 ***	0.317
Adjusted R2	0.577 ***		0.646 ***		0.698 ***	
Adjusted R2 Change (F)			0.070 (19.736)***		0.052 (17.191) ***	

<sup>a</sup> As the hybrid organization element variables are coded as binaries, Internal Ownership is excluded as the baseline variable against other hybrid organization element variables.

+ p < .10 \* p < .05 \*\* p < .01 \*\*\* p < 0.001

ally larger in regression than in pairwise mean correlation analyses. This may indicate that Rewards is reasonably independent of the other variables in the model, operating more directly with innovation and less correlated with the other independent variables associated with hybrid organizational designs.

In the second step of our model, we included the binary variable of firm size. Since small firms were coded as “0” and larger firms as “1,” a negative and significant coefficient for the firm size interaction term indicates that the elements of hybrid organizational design are less strongly connected with innovation in small firms than in large firms. It is possible to imagine that smaller firms engender more organic innovation and thus do not necessitate hybrid organizational design elements in the same way as larger firms do in order to generate innovation. We take up this point in our discussion. In the third step of our model, we test the moderat-

ing impact of organizational support. From our review of the literature, Support was identified as a variable that might strengthen or weaken the relationship between the other aspects of hybrid organizational design, and our results offer support for this idea, another element we take up in the discussion.

## DISCUSSION

Despite considerable research on organization design across various management literatures, questions regarding the connection with innovation have remained. In this paper, we aggregate 20 years’ worth of data from academic research which permits us to speak to a number of current issues in the design of organizations for increased innovation. The pace of change in modern economies is so evident that any theory of organizational design ought to be able to help explain the rate of innovation in advanced capitalist societies. Our empirical exami-

nation of the linkages between hybrids and innovation using a meta-analysis of existing data is an effective research strategy for testing the framework because it leverages the richness of research on organizational innovation. Our results show that movements in a more market-like direction (greater autonomy for employees, more market-like rewards, more external market ownership) are strongly related to innovation in organizations.

### *Dimensions of Autonomy*

Our results show a meaningful mean effect size between autonomy and innovation. Recent work has suggested that autonomy is a multidimensional construct (Sadler-Smith et al., 2003; Lumpkin, Cogliser, & Schneider, 2009). It would be helpful to have a more precise understanding of exactly which aspects of autonomy are most related to innovation performance. Autonomy has been classically manifest in employee empowerment in manufacturing operations such as Toyota's lean production system. But we also observe that discretion in terms of significant blocks of time appears to be an important aspect of autonomy at Google, where employees are granted 20% of the workweek to explore new ideas. In other environments, however, the relevant aspect of discretion may lie with either financial resources or tangible resources, such as the warehouse of easily scavengeable spare parts that Thomas Edison used to assemble innovations like the phonograph and the telephone.

### *Distribution of Rewards*

Similarly, more specificity is needed on exactly which aspects of rewards are specifically related to particular aspects of innovative behavior, and what the trade-offs are in administering these rewards (Hayton, 2005: 37–38). For example, Lee et al. (2004) show that evaluation pressure may offset the incentives for innovative behavior. Practical research into innovation using an exercise termed “the Marshmallow Challenge” (Wujek, 2010) has shown that high-stakes rewards have a strong and negative relationship with innovation among unskilled or unpracticed individuals, and that high-stakes rewards are only connected with innovation when individuals have the skills necessary for the task.

### *Ownership*

Finally, our analysis shows that despite the perception among both practitioners and some academics that “bringing the market inside the firm” involves “making employees *feel like* owners” (Baker, Gibbons, & Murphy, 2001: 212) the reality is that internal ownership is negatively correlated with innovation, whereas external ownership is positively correlated with it. Perhaps, to look again at Baker et al.'s words quoted above, the operative words for organizations seeking to encourage innovation are to make employees feel like owners (by the judicious use of rewards and by simulating the self-employment experience by offering significant autonomy in the workplace), without actually making them owners. Viewed from the perspective of our analyses, we are not satisfied with the completeness of the ownership literature as it relates to innovation. While we were able to include sufficient studies investigating the connection, we note with an eye toward future investigation that a wider range of ownership variables needs to be considered and even compared for a more complete analysis, such as public ownership, family ownership, entrepreneur-owned ventures, and angel and venture capital-backed firms.

### *Benefits of Smallness*

The paradox of firm size is relentless. It is the great aspiration of small innovative firms to become large. And it is the great aspiration of large firms to become as innovative as they were when they were small. Our results offer two inputs. The first is that innovation in small firms appears to have less to do with hybrid organizational design elements than it does in larger firms. This may be a reflection of the phenomenon that W. L. Gore observed 50 years ago, and that has driven organization design within his highly successful firm ever since. His observation is that human beings face a natural cognitive limitation in terms of the number of people they can interact informally with. For Gore, that number was 150. Organizations with fewer than 150 employees behaved like cohesive informal teams. Organizations with more than 150 employees behaved like formal bureaucracies. Gore's solution to this observation, too radical for many organiza-



tions, was to physically split any group in the Gore organization when that group exceeded 150 people. The result has created a firm composed of dozens of independent business units, all fewer than 150 people, composing an overall firm that has been consistently profitable and identified as one of the “Best Places to Work” for many years. And while we cannot explore Gore’s hypothesis with our data (we operationalize firm size from study design so have limited granularity) we also recognize that the firm has limited success exploiting “big” opportunities that require scale beyond the limits of the business unit<sup>1)</sup> (Sathe, 2003). This issue suggests caution for practitioners and future possibilities for researchers. The second input offers clear encouragement for larger firms – that firms which choose to optimize for innovation do have functional organizational levers at their disposal for encouraging such activity. Those levers may come with unintended consequences that we do not measure or even imagine here, but they at least point to possible paths of action.

### *Need for Support*

We are fascinated by both the strength of the main effect relationship between support and innovation, and the strength of the moderating impact of support on autonomy and rewards. The implications of these findings suggest that levers organizations wish to employ to encourage innovation be accompanied by organizational support. Organizations can offer employees the time, resources and rewards to innovate, but if those employees feel that the organization will not support their efforts or manage their failures, they will be less likely to engage in innovative activity. As with the other elements of hybrid organizational design, there appears to be a wide range of ways organizational support can manifest. We view this as both a research opportunity and a practical opportunity. From a research perspective, finding a setting and a method that enables comparison of some of the wide variety of organizational support implementations would represent a valuable contribution. And for organization designers in firms both large and small (though perhaps more so for large firms, per our comments above), there exists a broad palette of alternative actions for providing organizational support for

innovators.

### *Change over Time*

A final point we mention is that meta-analytic research results do change over time and are therefore perishable. We compare, for example, the result we report on the autonomy-innovation relationship with the results reported for centralization-innovation by Damanpour (1991) and for mechanistic organizational design by Calantone, Harmancioglu, and Droge (2010). This comparison of results shows that the effect size of autonomy-innovation is meaningfully larger in our analyses, which include only studies from 1990 to 2009, compared to those used by Damanpour (1967–1988) or Calantone et al. (1976–2006). And while we present this only as observation, we do speculate that the accelerated pace of globalization, competition and technology may explain why organizations see a stronger relationship between autonomy and innovation when only more recent studies are sampled.

### *Limitations*

Meta-analyses are only as good as the studies on which the analysis is based and therefore share limitations inherent to underlying sources. A case in point in the present study is organizational design choices which are potentially endogenous to a broader set of strategic choices the organization makes. However, this endogeneity issue is hardly ever controlled for in the underlying studies we meta-analyzed, and therefore this concern cannot be eliminated in our meta-analysis. Therefore, when individual studies included in the analysis contain limitations, or if the entire set of studies reflects a general publication bias, the meta-analysis will likewise contain these limitations. Further, many studies published in the literature do not contain the data necessary to include them in meta-analysis, a common complaint of meta-analysis authors (Read, Song, & Smit, 2009). We identified numerous studies of interest that did not include key statistics, such as correlation tables. A further limitation of the method is granularity. While meta-analysis offers extraordinary power to bring a large body of diverse extant work to a research question, it does not afford insight into detailed sub-questions within the data, such as whether

young people and older people respond differently to rewards. There are many nuanced elements in the governance thesis which might profitably be explored using alternative methods.

### Conclusions

Despite certain limitations, the findings we present in this paper offer several useful contributions to both researchers and senior managers. We have shown that there is room for researchers to consider a more cohesive theory and practice of organizational design as it relates to innovation. Not only do we find direct relationships between autonomy, rewards and ownership and innovation but our moderation model also indicates that these effects are sensitive to organizational support for innovation. This means that in the domain of innovation, the configuration of organizational factors to effect innovation proclivity continues to represent a promising research agenda for organizational researchers and actionable levers for organizational designers.

### NOTE

- 1) We would like to recognize the contribution of an anonymous reviewer in raising this point.

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